Automated Hematology Analyzer /
Transportation units

XN series

(XN-9000)
Instructions for Use

Sysmex Corporation

KOBE, JAPAN

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Chapter 1 Introduction

Thank you for purchasing the XN series automated hematology analyzer.
Please read this manual carefully before operating this product.
Keep this manual in a safe place for future reference.

Note:

- Data generated by the XN series is not intended to replace professional judgment in the determination of a diagnosis or in monitoring patient therapy.
- Operate the instrument as instructed. Reliability of test results cannot be guaranteed if there are any deviations from the instructions in this manual. If the instrument fails to function properly as a result of either the user's operation not specified in the manual or the user's utilization of a program not specified by Sysmex, the product warranty would not apply.

Contact Address

Manufacturer

SYSMEX CORPORATION
1-5-1 Wakinohama-Kaigandori, Chuo-ku, Kobe 651-0073, Japan

Authorized Representative

EC REP

European Representative
SYSMEX EUROPE GmbH
Bornbarch 1, 22848 Norderstedt, Germany
Phone: +49 40 5 27 26-0 / Fax: +49 40 5 27 26-100

Americas

SYSMEX AMERICA, Inc.
577 Aptakisic Road, Lincolnshire, IL 60069, U.S.A.
Phone: +1-224-543-9500 / Fax: +1-224-543-9505

Asia-Pacific

SYSMEX ASIA PACIFIC PTE LTD.
9 Tampines Grande #06-18 Singapore 528735
Phone: +65-6221-3629 / Fax: +65-6221-3687

Ordering of Supplies and Replacement Parts

If you need to order supplies or replacement parts, please contact your local Sysmex representative.

Service and Maintenance

Please contact the Service Department of local Sysmex representative.

CE-mark

CE

The IVD-system described in this manual is marked with a CE-mark which confirms the observance of the essential requirements of the following European directive: 98/79/EC IVD Directive

1.1 Intended use

The XN series is an automated hematology analyzer for in vitro diagnostic use in clinical laboratories. Only human blood, human body fluids or control blood should be run. Any other use is regarded as non-specified.
Use only the reagents and cleaning fluids mentioned in this manual.
If the instrument fails to function properly as a result of either the user's operation not specified in the manual or the user's utilization of a program not specified by Sysmex, the product warranty would not apply.

1.2 Overview of the system

This instrument is a blood count analyzer for in vitro diagnostic use in screening patient populations found in clinical laboratories.
This instrument enables quantitative, identification, and existence ratio analysis and flagging of tangible components of blood and body fluid (red blood cells, white blood cells, platelets and other cells) by means of electrical impedance, laser light scattering, and dye bonding.
The analysis data appears on the screen of the IPU (Information Processing Unit)*.
* This manual refers to the Information Processing Unit as IPU.

The XN series consists of the components and options below, which are used in a suitable combination. The components and options may be sold as individual units.
- Analyzer (XN-10/20)
- Sampler section (SA-10/SA-01/SA-20/SA-30)
- IPU
- Pneumatic unit
- SP-10
- Additional components

Analyzers are classified into 6 types depending on differences in the included channels.
- XN-10: XN-10[B1], XN-10[B2], XN-10[B3], XN-10[B4]
- XN-20: XN-20[A1], XN-20[A2]

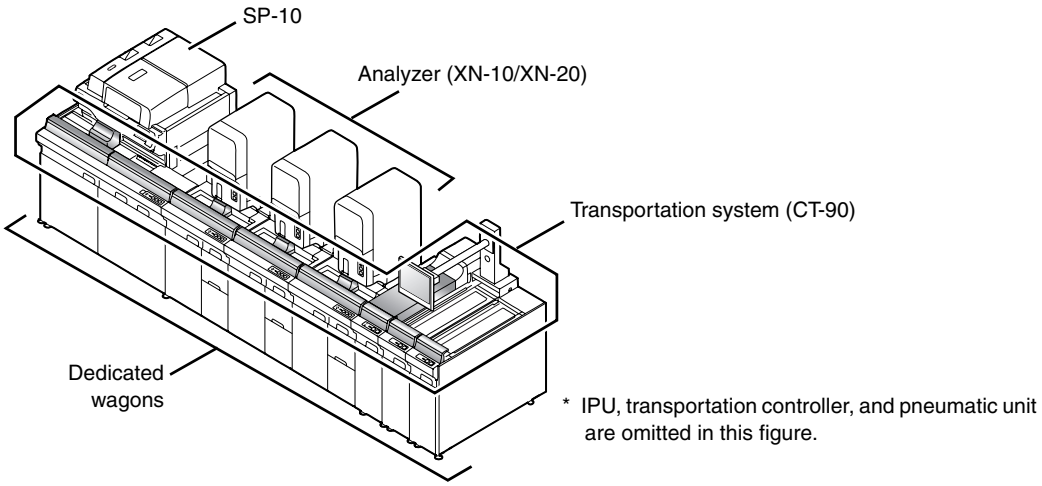
Channels	Analyzer Type					
	XN-20		XN-10			
	[A1]	[A2]	[B1]	[B2]	[B3]	[B4]
WNR	✓					
RBC / PLT	✓					
HGB	✓					
WDF	✓					
WPC	✓	✓	—	—	—	—
RET	✓	✓	✓	—	✓	—
PLT-F	✓	—	✓	✓	—	—

1.2.1 Configuration description

System expansion is possible by combining components and options. The system name varies depending on the combination. This manual explains the system configuration below (XN-9000).

XN-9000

System including 2 to 9 analyzers (XN-10/XN-20), an SP-10 automated hematology slide preparation unit, and transportation units.
For an overview of the SP-10, see the SP-10 manual.



External view of XN-9000 (basic configuration)

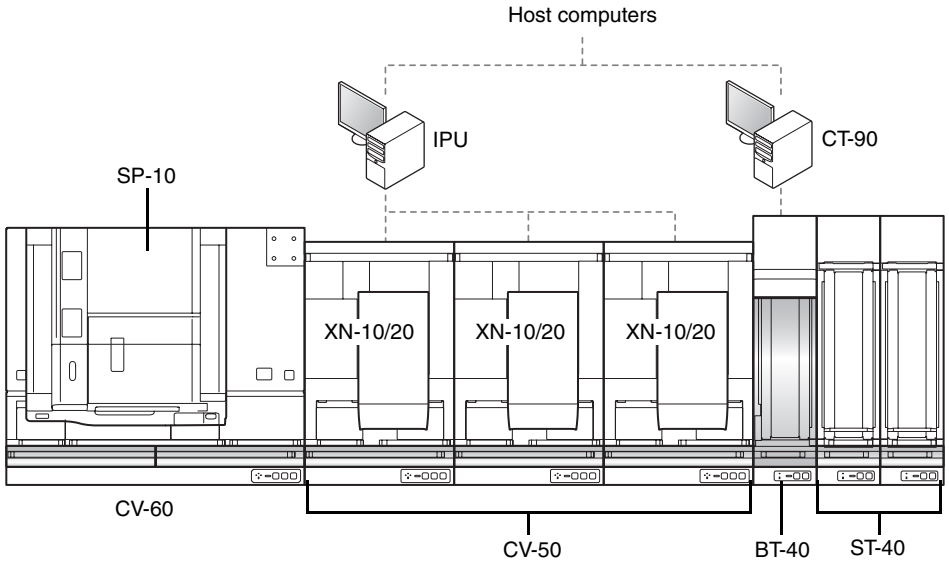
1.2.2 Overview of the transportation system

The transportation system automatically transports samples and automates the complete process, from analyzing the blood to creating a smear (when using SP-10). As a result, streamlining of lab work can be achieved.

- Equipment configuration that can be changed according to laboratory size
- Maximization of the instrument's processing power through automation
- Efficient transporting and testing process for each analysis order
- Improved workability through automatic transporting of racks
- Support for STAT sample analysis
- High level of reliability of analyzers and devices assures maximum testing productivity.

1.2.3 Transportation system configuration

The basic configuration of the transportation system is as follows.
Other configurations are also possible to work with your environment.



Top view

Note:

- The procedures in this manual assume a basic configuration shown in the above figure.
- The transportation system is controlled by the transportation controller (CT-90). The operation of the XN Conveyor (CV-50) that takes place near the analysis line is controlled by the IPU. This manual defines conveyor functions controlled by the IPU as "sampler functions". e.g. Sampler analysis, sampler status displayed on the IPU, etc.

1.3 Analysis parameters

This instrument analyzes the following parameters.

[Whole Blood]/[Low WBC]/[Pre-Dilution] mode

Parameters		XN-20		XN-10			
		[A1]	[A2]	[B1]	[B2]	[B3]	[B4]
WBC	White blood cell (leukocyte) count			✓			
RBC	Red blood cell (erythrocyte) count			✓			
HGB	Hemoglobin concentration			✓			
HCT	Hematocrit			✓			
MCV	Mean corpuscular volume			✓			
MCH	Mean corpuscular hemoglobin			✓			
MCHC	Mean corpuscular hemoglobin concentration			✓			
PLT	Platelet count			✓			
RDW-SD	Red cell distribution width (standard deviation)			✓			
RDW-CV	Red cell distribution width (coefficient of variation)			✓			
PDW	Platelet distribution width			✓			
MPV	Mean platelet volume			✓			
P-LCR	Platelet-large cell ratio			✓			
PCT	Plateletcrit			✓			
NRBC#	Nucleated red blood cell count			✓			
NRBC%	Nucleated red blood cell percent			✓			
NEUT#	Neutrophil count			✓			
LYMPH#	Lymphocyte count			✓			
MONO#	Monocyte count			✓			
EO#	Eosinophil count			✓			
BASO#	Basophil count			✓			
NEUT%	Neutrophil percent			✓			
LYMPH%	Lymphocyte percent			✓			
MONO%	Monocyte percent			✓			
EO%	Eosinophil percent			✓			
BASO%	Basophil percent			✓			

Parameters		XN-20		XN-10			
		[A1]	[A2]	[B1]	[B2]	[B3]	[B4]
IG#	Immature granulocyte count	✓					
IG%	Immature granulocyte percent	✓					
RET%	Reticulocyte percent	✓	✓	✓	—	✓	—
RET#	Reticulocyte count	✓	✓	✓	—	✓	—
IRF	Immature reticulocyte fraction	✓	✓	✓	—	✓	—
LFR	Low fluorescence ratio	✓	✓	✓	—	✓	—
MFR	Medium fluorescence ratio	✓	✓	✓	—	✓	—
HFR	High fluorescence ratio	✓	✓	✓	—	✓	—
RET-He	Reticulocyte hemoglobin equivalent	✓	✓	✓	—	✓	—
IPF	Immature platelet fraction	✓	—	✓	✓	—	—

[Body Fluid] mode

Parameters		XN-20		XN-10			
		[A1]	[A2]	[B1]	[B2]	[B3]	[B4]
WBC-BF	White blood cell (leukocyte) count	✓					
RBC-BF	Red blood cell (erythrocyte) count	✓					
MN#	Mononuclear count	✓					
PMN#	Polymorphonuclear count	✓					
MN%	Mononuclear percent	✓					
PMN%	Polymorphonuclear percent	✓					
TC-BF#	Total nucleated cell count	✓					

* The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.

[HPC] mode

Parameters		XN-20		XN-10			
		[A1]	[A2]	[B1]	[B2]	[B3]	[B4]
HPC#	Hematopoietic progenitor cell count	✓	✓	—	—	—	—

Other parameters are the same as in [Whole Blood] mode.

* HPC analysis can only be performed if the instrument offers the HPC analysis mode.

1.4 About the manuals

1.4.1 List of manuals

The following manuals are provided with this instrument.
Each manual is bound and included in the product; however, a manual with the same content is also built into the IPU. For procedures on viewing the manual, see Chapter 6.
(➤**P.6-31** "Chapter 6: 6.9 On-line manuals")

- **Instructions for Use (this manual)**
  This manual explains how to operate the instrument, focusing primarily on routine work.
- **Administrator's Guide**
  This manual explains the operations such as configuration of the instrument.
- **SP-10 Instructions for Use**
  This section explains how to operate the SP-10.

1.4.2 Structure of this manual

This manual consists of the following chapters.

Chapter	Description
Chapter 1: Introduction	Explains an overview of this manual and of the instrument.
Chapter 2: Safety Information	Explains precautions to be observed for safe use of the instrument, and also explains the meaning of the safety symbols that appear on the instrument.
Chapter 3: Before using the system	Explains information you should know before using the system.
Chapter 4: Part Names and Functions	Explains external views, names and functions of each of the devices connected to the instrument.
Chapter 5: Reagents	Explains the reagents to be used in the instrument.
Chapter 6: Basic Operation	Explains how to perform basic operations, such as start-up, shut-down of the system.
Chapter 7: Preparing for analysis (registering information)	Explains how to register and manage analysis orders, patient information, doctor information, and ward information.
Chapter 8: Performing Quality Control	Explains how to perform regular administrative tasks to ensure reliable analysis results.
Chapter 9: Analyzing samples	Explains how to analyze samples.
Chapter 10: Checking analysis data (Sample Explorer)	Explains the Sample Explorer function used to check and manage the analysis data in list format.
Chapter 11: Checking detailed analysis information (Data Browser)	Explains the Data Browser function used to check and manage the detailed information of the analysis data.
Chapter 12: Performing Calibration	Explains the calibration function used to ensure the accuracy of the instrument.

Chapter	Description
Chapter 13: Performing maintenance of instrument and replacing supply parts	Explains an overview of the maintenance tasks for the instrument and explains how to perform those tasks, including the replacement of reagents and supply parts.
Chapter 14: Troubleshooting	Explains the errors that may occur in the system and how to troubleshoot them.
Chapter 15: Technical Information	Explains technical information such as specifications and principles.

1.4.3 Points to note about this manual

- You may not reprint the contents of this manual in whole or in part without permission.
- The names of patients, doctors, etc., mentioned in this manual do not represent actual people in any way.
- Images and certain details related to product are for illustration purposes only and may not exactly match with what is indicated within this manual.
- The screens used in this manual are for Windows 7.

1.5 Symbols used in this manual

Note, Information, Caution and Warning statements are presented throughout this manual to call attention to important safety and operational information. Non-compliance with this information compromises the safety features incorporated in the analyzer.

Risk of infection
Indicates the presence of a biohazardous material or condition.

Warning!
High risk. Ignoring this warning could result in personal injury to the operator.

Caution!
Average risk. Ignoring this warning could result in property damage. To avoid damage and incorrect measuring results.

Information
Minor risk. Considerations that should be observed when operating this instrument.

Note:
Background information and practical tips.

Indicates that the operation supports the touchscreen.

1.6 Trademarks

- Sysmex is a registered trademark of SYSMEX CORPORATION, Japan.
- CELLPACK, CELLCLEAN, Fluorocell, SULFOLYSER, and Lysercell are trademarks of SYSMEX CORPORATION.
- ISBT128 (International Society of Blood Transfusion) is copyrighted by and is used under License Agreement with ICCBBA, Inc.
- Windows is a trademark or registered trademark of Microsoft Corporation in the United States and other countries.

Other company names and product names in this manual are the trademarks or registered trademarks of their respective owners. The fact that a trademark is not explicitly indicated in this manual does not authorize its use. TM and ® are not explicitly indicated in this manual.

Chapter 2 Safety Information

This chapter explains precautions for safe use of this instrument.

2.1 General information

⚠ Warning!

- Keep your hair, fingers and pieces of your clothing away from the instrument while it is running.
  You may get injured by getting them caught in the instrument.
- Do not spill blood samples or reagents into the instrument, or get any metals, such as staples and clips, inside the instrument.
  Doing so could cause a short-circuit.
- The operator should not touch any electrical circuitry inside the cover.
  In particular, the risk of electrical shock is especially high when one's hands are wet.
- Avoid damage to the power cable: do not place any heavy object on the power cable or pull on it.
  Doing so may cause a fire or shock due to an electrical short or a break in the wiring.
- In the unlikely event that the instrument emits an unusual odor or smoke, immediately turn OFF the main switch and unplug the power cable. Then contact Sysmex service representative.
  Continued use of the instrument in such conditions could result in fire, electrical shock or personal injury.

⚠ Caution!

- Never touch the sample rack while the instrument is working.
  Touching a rack or a sample tube especially when the rack is moving could cause sample spillage.
- Do not lean against the instrument.
  The resulting impact could damage the instrument or cause it to tip over.

2.2 Installation

⚠ Warning!

- The unpacking, setup and confirmation of correct initial operation is performed under the direction of Sysmex technical service.
- This instrument must not be connected to a power outlet rated at anything other than specified in the rated plate.
  Please note that the instrument must be grounded.
  Failure to do so may cause a fire or electrical shock.
- Switch OFF the power supply before connecting any peripheral devices (host computer, printer, etc.).
  This is to prevent electrical shock hazard. If a peripheral device is connected after the instrument is started up, the instrument may stop abnormally.

Caution!

- Install the instrument in a place protected from water splashes.
- Install in a place where the instrument will be protected from high temperature, humidity, dust and direct sunlight.
- Install the instrument in a location that is free from any strong shock or vibration.
- Install the instrument in a well ventilated place.
- Avoid installation of the instrument near devices that emit electrical interference, such as radio, centrifuge, etc.
- Do not use this instrument in any operating environment which has electroconductive or flammable gases, including oxygen, hydrogen, and anesthesia.

2.3 Electromagnetic compatibility (EMC)

This instrument complies with the following IEC (EN) standards:

- IEC61326-2-6:2005 (EN61326-2-6:2006)
  Electrical equipment for measurement, control and laboratory use - EMC requirements
- EMI (Electromagnetic Interference) For this standard the requirements of class A are fulfilled.
- EMS (Electromagnetic Susceptibility) For this standard the minimum requirements with regards to immunity are fulfilled.
- This equipment has been designed and tested to CISPR11 Class A. In a domestic environment it may cause a radio interference, in which case, you may need to take measures to mitigate the interference. The electromagnetic environment should be evaluated prior to operation of the device.
  Do not use this device in close proximity to sources of strong electromagnetic radiation (e.g. unshielded intentional RF sources), as these may interfere with the proper operation.

This instrument includes an RFID(Radio-Frequency Identification Device) module.

- RFID device: TR3-C202-A0-8
- Intended use: This RFID module is an electromagnetic induction type non-contact IC can read and write RFID tag data.
- This instrument complies with IDA Standards.

- The compliance mark indicates that the product complies with the applicable standard and establishes a traceable link between the equipment and the manufacturer, importer or their agent responsible for compliance and for placing it on the Australian and New Zealand market.

Caution!

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2.4 Avoiding infections

Risk of infection

- When performing any task on the instrument, such as testing, maintenance, preparation, or post processing, be sure to wear protective garments and gloves. Also, wash your hands after completing the process.
  There is a risk of infection.
- Never touch waste, or parts that have come in contact with waste, with your bare hands.
  If you inadvertently come in contact with potentially infectious materials or surfaces, immediately rinse the skin with large amounts of water, then follow your laboratory's prescribed cleaning and decontamination procedures.
- Use appropriate care when handling samples and quality control materials. In the unlikely event that some infectious material gets in the eyes or an open wound, rinse with large amounts of water and seek immediate medical attention.

2.5 Handling of reagents and quality control materials

Warning!

- CELLPACK diluent is a good electrical conductor. If diluent is spilled inadvertently near electrical cables or appliances, there is a risk of electrical shock. Switch the instrument off, unplug it and wipe-up the liquid.
- CELLCLEAN AUTO contains sodium hypochlorite.
  If CELLCLEAN AUTO comes in contact with the instrument's surface, it may corrode its finish. Immediately wipe off CELLCLEAN AUTO with a damp cloth.

Caution!

Follow directions on QC material labeling.

For other cautionary points, see Chapter 5. (➤**P.5-1**"Chapter 5: Reagents")

2.6 Laser

Warning!

The analyzers have a semiconductor laser unit that is located inside the instrument. To avoid physical risk of injury from the laser, access is limited to authorized Sysmex technical representative.

2.7 Maintenance

Information

When performing maintenance, use only the tools specially authorized by Sysmex.

2.8 Disposal of materials

2.8.1 Waste Disposal

Risk of infection

After becoming waste at end-of-life, this instrument and its accessories are regarded as infectious. They are therefore exempted from EU directive 2012/19/EU (Waste Electrical and Electronic Equipment Directive) and may not be collected by public recycling to prevent possible risk of infection of personnel working at those recycling facilities.

Warning!

- Do not dispose the instrument, accessories and consumables via public recycling!
- Incineration of contaminated parts is recommended!
- Contact your local Sysmex service representative and receive further instructions for disposal! Follow local legal requirements at all times.

Caution!

Waste effluents from the instrument may contain dangerous substances in it and decision about disposal only has to be made by local water authority.

2.8.2 Decontamination

Warning!

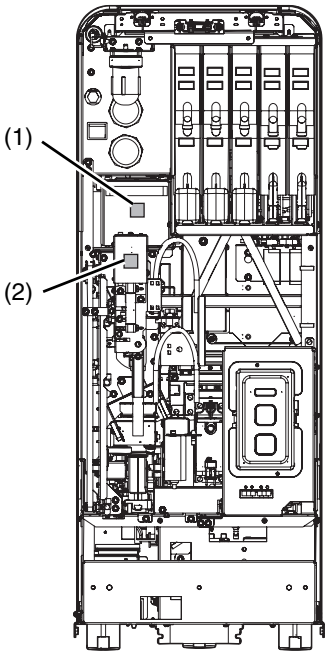
Before decontaminating the instrument, be sure to turn off the power supply and unplug the power cord. This is necessary to avoid the risk of electric shock. When cleaning the instrument, always wear protective gloves and gown. Also, wash hands after decontamination carefully with antiseptic solution first and with soap afterwards. Do not open the instrument for decontamination inside. This is executed only by Service Technician.

Information

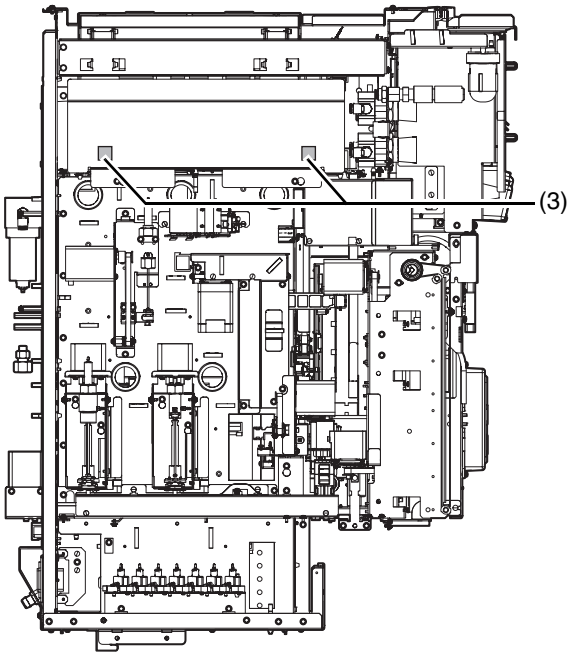
- To ensure decontamination of the instrument outer surfaces, clean the instrument surface at the end of the daily work. This has to be executed in the following three situations;
  - Regularly, at the end of a daily work,
  - Immediately, during contamination with potentially infectious material, and
  - In advance of repair or maintenance by the field technical service representative.
- Wipe off the instrument surfaces using a cloth soaked with a suitable decontamination solution. Please use one-way cloths, e.g. made of paper or cellulose. The cloth may be moistened in a way only that no wetness may reach the inside of the instrument.
- The indicated residence time of the decontamination solution shall be observed.
- If required, you may afterwards remove normal contaminations with commercial neutral detergent, in case these could not be removed by the decontaminant.
- As a last step the instrument shall be dried with a dry one-way cloth.

2.9 Markings on the system

Interior of the Analyzer



Front view



Left view

(1)

Caution!

Do not perform analysis while cover is open as outside noise will affect the data.

(2)

Risk of infection

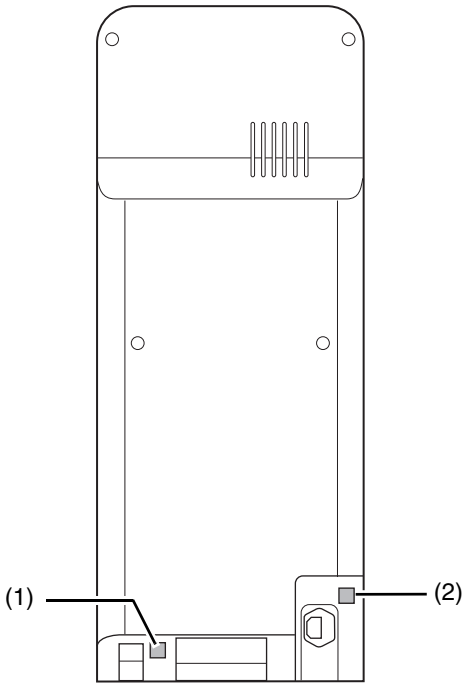
In principle, all parts and surfaces of the instrument must be regarded as infective.

(3)

Warning!

To avoid electrical shock, unplug the cord before servicing.

Rear of the Analyzer



(1)

Risk of infection

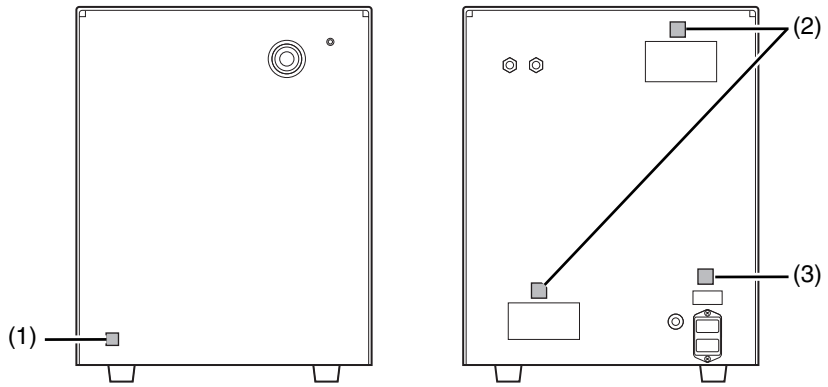
In principle, all parts and surfaces of the instrument must be regarded as infective.

(2)

Warning!

- To avoid electrical shock, unplug the cord before servicing.
- Replace only with fuses of the specified type and current rating.

Pneumatic unit



Front view **Rear view**

(1)

Risk of infection

In principle, all parts and surfaces of the instrument must be regarded as infective.

(2)

Caution!

Do not block the exhaust opening.

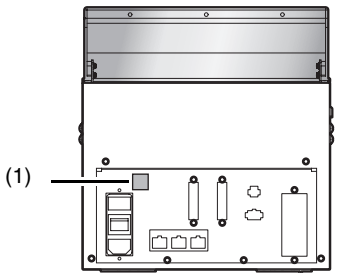
(3)

Warning!

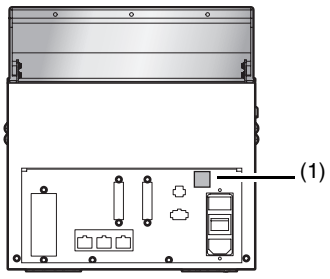
- To avoid electrical shock, unplug the cord before servicing.
- Replace only with fuses of the specified type and current rating.

Transportation units

Start yard/Stock yard (ST-40/41/42)



ST-40 Rear view



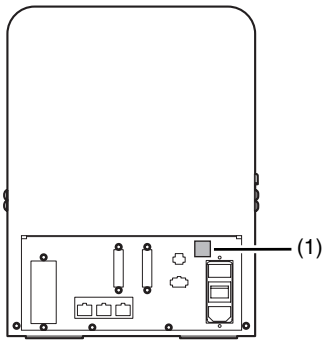
ST-41/42 Rear view

(1)

Warning!

- To avoid electrical shock, unplug the cord before servicing.
- Replace only with fuses of the specified type and current rating.

Barcode terminal (BT-40)



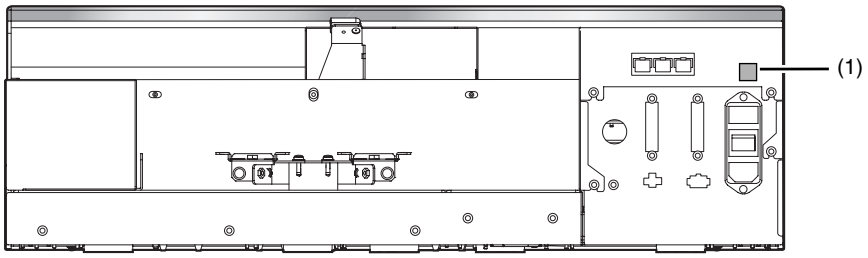
Rear view

(1)

Warning!

- To avoid electrical shock, unplug the cord before servicing.
- Replace only with fuses of the specified type and current rating.

XN conveyor (CV-50)



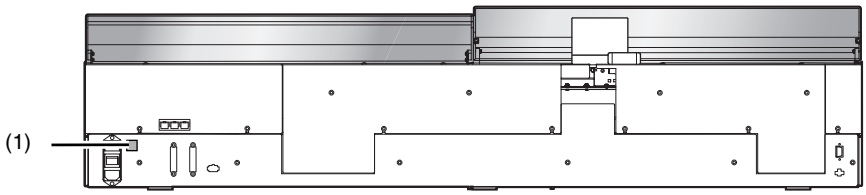
Rear view

(1)

⚠ Warning!

- To avoid electrical shock, unplug the cord before servicing.
- Replace only with fuses of the specified type and current rating.

SP conveyor (CV-60)



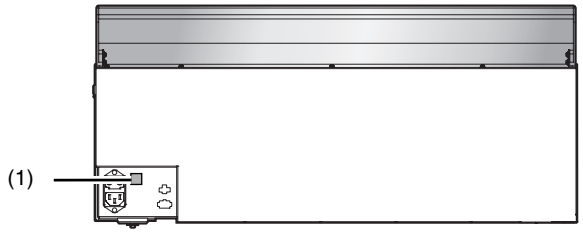
Rear view

(1)

⚠ Warning!

- To avoid electrical shock, unplug the cord before servicing.
- Replace only with fuses of the specified type and current rating.

Conveyor extension (CV-70)



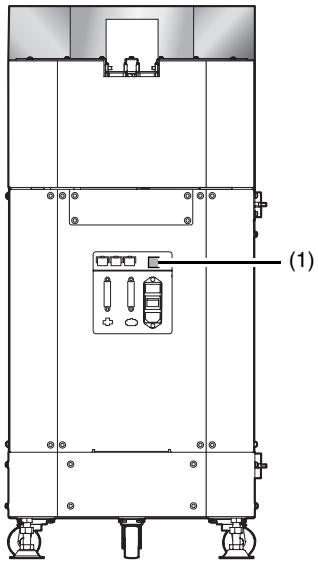
Rear view

(1)

Warning!

- To avoid electrical shock, unplug the cord before servicing.
- Replace only with fuses of the specified type and current rating.

Turn unit (TU-40)



Rear view

(1)

Warning!

- To avoid electrical shock, unplug the cord before servicing.
- Replace only with fuses of the specified type and current rating.

2.10 Operators

⚠ Caution!

- Only properly trained personnel shall use instrument.
- In the event that a malfunction of the instrument occurs, take the measures indicated in the Instructions for Use manual. Further resolution should be referred to your Sysmex technical representative.

2.11 Computer viruses

⚠ Warning!

Although our software has already been checked for computer viruses, the configuration of a specific user environment may make it prone to computer virus infections via the Internet or a network.
We recommend that our customers consider computer virus countermeasures that suits their computer operating environment. Customers that use antivirus software in their operating environment should take the following precautions.

1. Use the antivirus software to periodically check for viruses.
   (1) Use antivirus software designed for your operating system to periodically check for viruses.
   (2) Disable the antivirus software during instrument software operation as it may adversely affect instrument operation.
   (3) Disable functions that check file access.
   (4) Disable firewalls and any other functions that protect or control data transfers.
2. Do not install any software other than the antivirus software.
3. USB memory sticks, CD-Rs and other external memory devices should be checked for viruses before use.
4. Do not open files attached to email or files of unknown origin without first performing a virus check.
5. Do not download files from the Internet or other sources that are not required for instrument operation. However, the virus definition files used by the antivirus software are not subject to this restriction.
6. Always check for viruses before accessing files in a folder shared with other computers.
7. Check effectiveness of computer virus countermeasures used on other computer systems in your laboratory, and select the most effective for use on this instrument.
8. The customer must take sole responsibility when connecting to an external network (for example, the Internet).

2.12 Use of other software

Warning!

- Do not install any software other than that preinstalled on the instrument. And do not run any other software on the instrument. However, this restriction does not include the installation of antivirus software.
- Note that we will accept no liability whatsoever for any malfunctions arising from use of other software.

Chapter 3 Before using the system

This chapter explains information about proper use of the system.

3.1 Preparing for installation

This instrument is installed/moved by Sysmex service representatives. The following is a list of things to do beforehand to prepare for the installation/move.

- Secure ample space for installation, with safety considerations.
  For details, see Chapter 15. (➤**P.15-49** "Chapter 15: 15.6.4 Installation space")
- Note the weight of this instrument. Make sure that the floor and/or the equipment on which the instrument is to be installed can withstand the weight.
- The power cable for this instrument is 2.0 m long. Use a nearby outlet that is designed for it.
- Once this instrument is delivered, check the condition of its packaging as soon as possible.

> **Information**
> If the packaging has been damaged in any way, contact Sysmex representative as soon as possible.

- Until the installation is ready, store this instrument as packaged in a dry place. Store upright.

3.2 Basic settings of the system

After the instrument has been installed, the administrator must check the basic settings.
For the details on the instrument's settings, see "Administrator's Guide".
(➤Administrator's Guide, "Chapter 4: Instrument Setup")

● Check the time.

Make sure that the time displayed on the IPU matches the current time.

● Check the Auto Output settings.

If Auto Output is necessary, check that the instrument is set for automatic transmission/printing before starting analysis.

3.3 Terms used in analysis

3.3.1 Sample No.

A sample number is a number and text string up to 22 digits in length that is assigned to a sample. Sample numbers are used to identify samples.
Sample numbers can be acquired by any one of the following methods:

- Manual input
- Reading sample tube barcodes with a barcode reader
- Automatic assignment (when a barcode read error occurs, etc.)
- Inquiry to host computer

When the auto increment function is on, the number is automatically incremented by one and assigned to each subsequent sample after the first sample number is set (during manual analysis).

3.3.2 Rack No./tube position

A rack number is a 6-digit number that identifies a rack. Rack numbers can be acquired by any one of the following methods:

- Manual input
- Reading rack barcodes with a barcode reader
- Automatic assignment (when a barcode read error occurs, etc.)

The sample tube position is a two-digit number that defines the sample tube position in a rack. There are 10 sample tube positions in a rack. Sample tube positions are assigned from the right side in the order "01, 02, 03, ...".

3.4 Supported sample tubes and racks

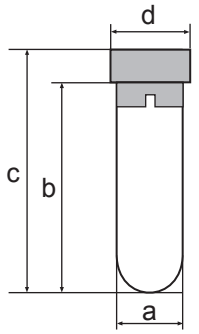
This section explains the sample tubes and racks you can use with this instrument.

3.4.1 Supported sample tubes

Regular sample tubes

Diameter (a)	ϕ11 to 15 mm
Length (b)	At least 57 mm
Length including the cap (c)	70 to 85 mm
Cap diameter (d)	ϕ18 mm or less

* Except for when performing micro analysis, use the tube with the cap on.



e.g. Tubes verified for proper operation

- VENOJECT II (Terumo)*
- Hemoguard (BD)
- VACUETTE (greiner)
- Monovette (SARSTEDT)

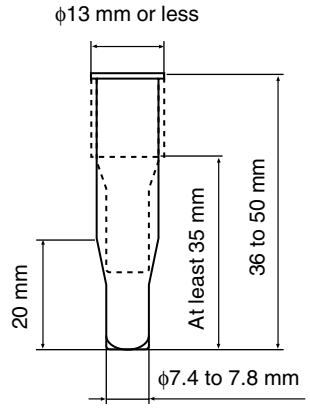
* Reusable caps cannot be used

> **Information**
>
> When performing sampler analysis using the VENOJECT II (Terumo), fold the film seal so that it does not protrude horizontally and then place in the rack. Otherwise, there is a risk that the seal will interfere with an adjacent sample tube and cause it to fall from the rack.

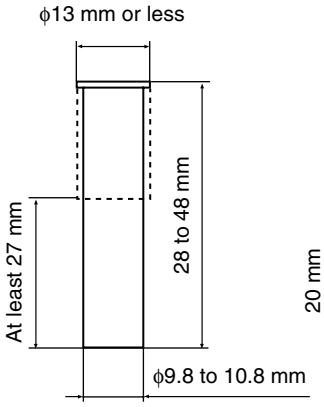
Micro collection sample tubes

Typical shapes of micro collection tubes are shown below.
Acceptable dimensions vary depending on the shape of the micro collection tube. The following are guidelines. Verification using the actual micro collection tube is necessary.

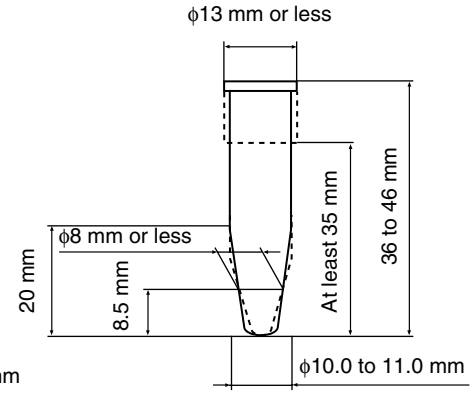
Type A



Type B



Type C



* Cap not included in dimensions. Open the cap during analysis.

e.g. Tubes verified for proper operation

- CAPIJECT (Terumo)
- Microtainer 365973 (BD)

Raised Bottom Tube (RBT)

A microtube that can be used in sampler analysis. Compatible dimensions are the same as regular sample tubes.

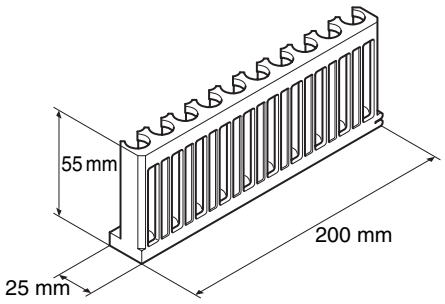
e.g. Tubes verified for proper operation

- Microtainer Map 363706 (BD)

> **Note:**
>
> For information on using sample tubes not described here, consult your local Sysmex representative.

3.4.2 Supported racks

Only Sysmex 10-tube racks can be used with normal sample tubes.
If the diameter of the tube is ϕ14 mm or less, attach a dedicated adapter onto the rack. A dedicated adapter is included with the instrument.



Caution!
To use Raised Bottom Tubes, place the tubes in a dedicated Raised Bottom Tube rack. Do not place regular sample tubes in the RBT rack.

3.5 Sample tube and rack barcode labels

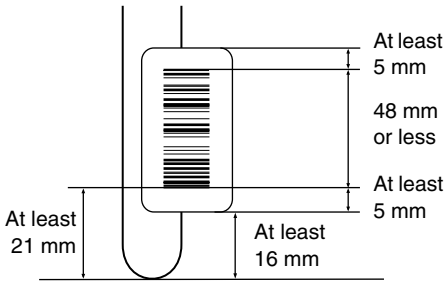
In order to achieve optimum performance levels of the system, laboratory must ensure that barcode labels are properly applied to the sample tube as well as rack labels. This section will provide the necessary information related to their application onto the sample tube and system rack.
For the specific information about barcode types, see "Administrator's Guide".
(➤Administrator's Guide, "Chapter 5: 5.3 ID Barcode Specifications")

Caution!
During the attachment of the barcode labels pay attention to prevent misreading of barcodes or mix-up of samples.

- Affix the label so that the lines of the barcode are run horizontally.
- Do not affix multiple labels.
- Label surfaces must not be wrinkled.
- Make sure that the label does not extend past the bottom of the sample tube.
- Make sure that no part of the barcode label is peeled off.
- Make sure that the labeled sample tubes can be inserted into and removed from the rack with ease.
- Do not write any text in the margins of a barcode label.

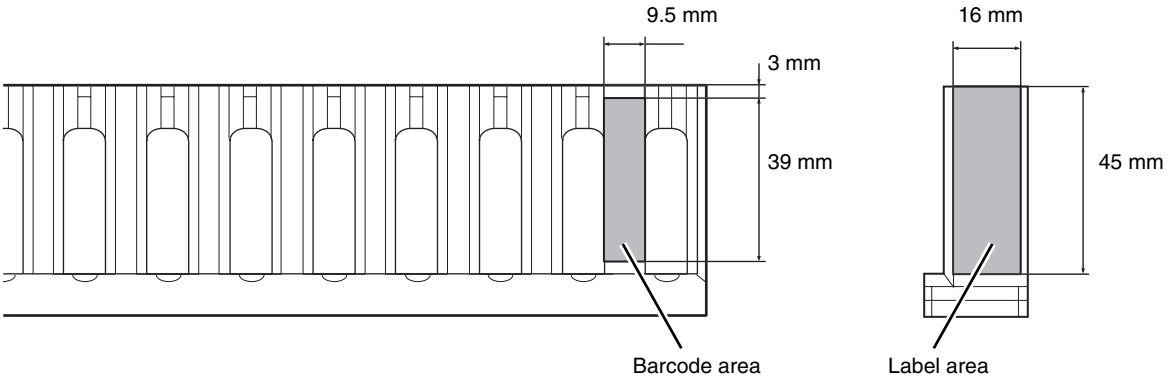
3.5.1 Sample tube barcode labels (sample numbers)

Apply barcode label to the sample tube so that its within the indicated distance shown in the figure on the right.



3.5.2 Barcodes for tube racks (rack numbers)

2 labels with same barcode number will accompany your system. Affix the label with printed text to the side of the rack for verification purposes.



3.6 Additional components

This instrument can be combined with various additional components to configure a system that better serves your purpose.

3.6.1 List of additional components

Item name	Description
Reservoir tank	A tank to store hemolytic agents and diluents.
RU-20	A reagent unit prepares (dilutes) concentrated reagent using RO water and feeds it to connected analyzers.
Touchscreen display	A display unit for the IPU. You can use the touchscreen to perform some of the operations.
Data printer	Prints analysis data in the ticket format.
Graphic printer	Prints lists of analysis information and results. Prints hardcopies of analysis results and screenshots of histograms, scattergrams, etc.
List printer	
Waste tank full sensor	Detects when the waste tank is full.
Start yard (ST-41)	Start yard used when arranging the transportation system.
Start yard (ST-42)	
Conveyor extension (CV-70)	Conveyor segment used as a by-pass around fixed objects such as pillars that maybe in the way of the automation line.
Turn unit (TU-40)	Used in configurations to allow line to turn 90° to the right or left.
Rack barcode reader (RB-10)	Installed with ST-41 to allow the ability to read and track racks that are on the XN-9000 line.
Monitor arm (DA-10)	The touch panel display can be operated close at hand. Use the monitor arm that is appropriate for the installation location.
Display arm stand for CV-60	
Display arm stand for ST	
External indicator light (SI-10)	Indicator light that enables you to check the current instrument status from a distance.
External indicator light (SI-11)	
External indicator light (SI-13)	
External indicator light (Lamp_Assy No.7)	

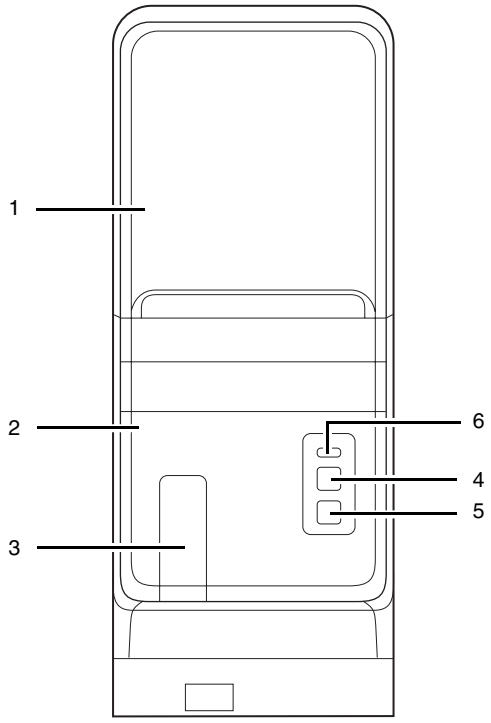
Chapter 4 Part Names and Functions

This chapter provides an external view and a summary of each device that makes up this instrument.

4.1 Analyzer

Analyzes patient and control samples.

Front view



1 Front top cover
Opens upward. Open this cover to inspect the interior of the analyzer, or to perform cleaning or maintenance tasks.

2 Front bottom cover
This is a protective cover. Open this cover to inspect the interior of the analyzer, or to perform cleaning or maintenance tasks.

3 Tube holder
Used to load the sample tubes for manual analysis.

4 Start switch
Press to start manual analysis.

5 Mode switch
Press to switch between manual analysis and sampler analysis. Pressing it opens and closes the tube holder.
When the tube holder is open: Manual analysis
When the tube holder is closed: Sampler analysis

6 Status indicator LED
Indicates the status of the device by LED.

Green/orange*	Ready (Analysis possible)
Flashing green/ orange*	Starting up / Analysis in progress / Mode switching in progress / Shutting down
Green	Waiting to execute maintenance
Flashing green	Maintenance in progress
Red	Error (without alarm) / Initializing system / Error stop / Stopped
Flashing red	Error (with alarm)
Not lit	Powered OFF

* Green during normal operation, orange when an error has occurred that allows operation to continue.

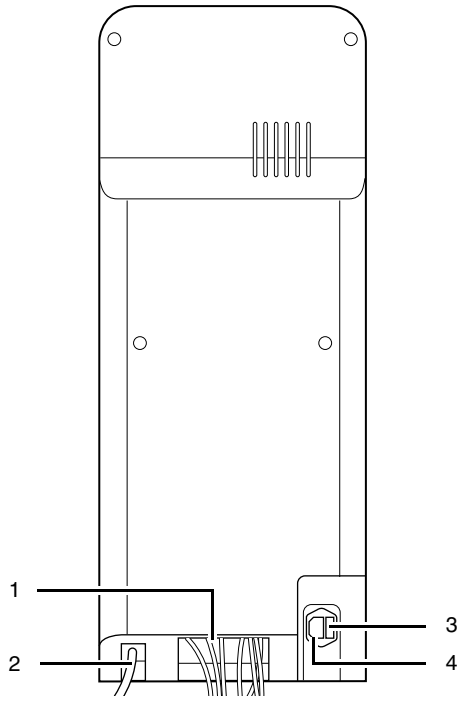
● **When using the optional external indicator light**

The indicator light is linked to the instrument status, and indicates the status as follows.

Priority levels	Status indicator LED	Indicator light
Low ↕ High	Ready / Analysis in progress / Starting up / Shutting down	Green
	Error / Initializing system / Stopped	Red (Flashes in red if an alarm is sounding)
	Power off / Error stop	Not lit

The indicator light lights green regardless of the above priority levels during switching of the analysis mode and while running maintenance.

Rear view



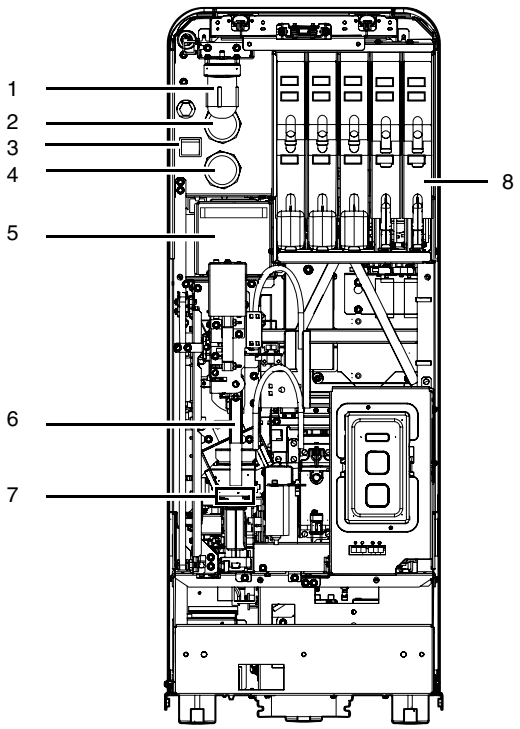
1 Various tubes/cables
Hydraulic tubes and electrical cables to be connected to the different devices.
The tubes and cables will be connected by Sysmex service representative.

2 Waste Fluid Outlet Nipple
Waste fluid is discharged via this nipple. Connect this to the drain or the waste container.

3 Fuse holder
Use a 250V 10A (Time Lag low breaking capacity) fuse.

4 AC power inlet
Supplies power using the provided power cable.

Front interior



1 Pneumatic trap chamber

Prevents the reagent from flowing back into the pneumatic unit, when the instrument malfunctions.

2 0.16 MPa regulator

Regulates the pressure at 0.16 MPa.

3 Main power switch

Turns the main power of the device ON/OFF.

> **⚠ Caution!**
> Do not turn this switch ON/OFF repeatedly within a short time.
> This will overload the fuse and may cause it to blow.

4 0.07 MPa regulator

Regulates the pressure at 0.07 MPa.

5 RBC/PLT detector section

Equipped with a RBC/PLT detector.

6 Tube grabber

Removes the sample tube from the rack and mixes it. Then after the analysis is complete, places the sample tube back in the rack.

7 Tube rotation mechanism

Rotates the sample tube to read its barcode label.

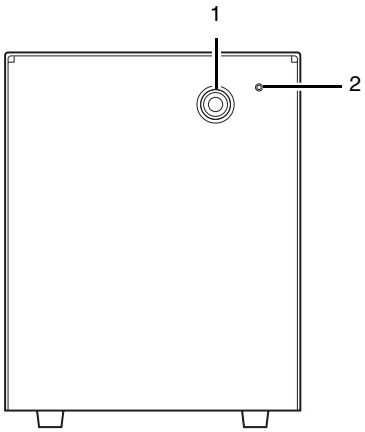
8 Dye cartridge holder

Holds the dye reagent.

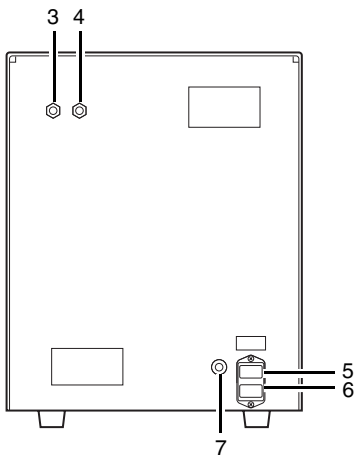
4.2 Pneumatic unit

Supplies vacuum and pressures to the device.

Front view



Rear view



1 0.25 MPa regulator

Regulates the pressure supplied to the analyzer at 0.25 MPa.

2 Pilot lamp

Lights up when the pneumatic unit's power is ON.

3 Pressure outlet nipple

Pressure is supplied to the analyzer from this nipple. Connect this nipple with the pressure supply nipple on the analyzer.

4 Vacuum outlet nipple

Vacuum is supplied to the analyzer from this nipple. Connect this nipple with the vacuum supply nipple on the analyzer.

5 Fuse

Use only with fuses of the specified type and current rating.
100 -117 VAC: Fuse 250V 4A (Time Lag)
220 - 240 VAC: Fuse 250V 3.15A (Time Lag)

6 Power connector

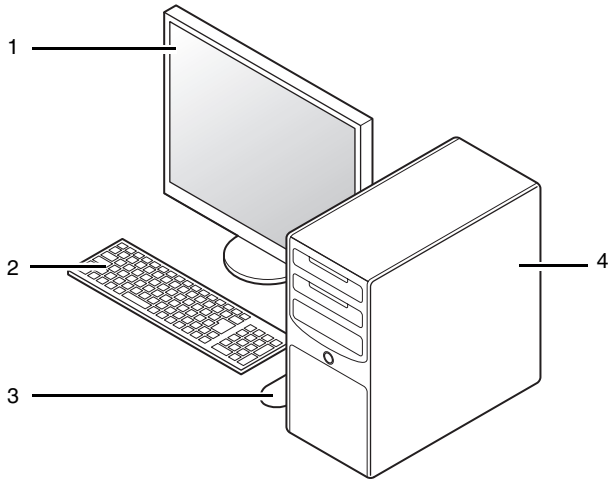
Supplies power using the provided power cable.

7 Pneumatic control input connector

An input connector for turning the pneumatic unit ON/OFF. Connect this to the pneumatic control output connector on the analyzer.

4.3 IPU (Information processing unit)

Processes and displays data generated by the analyzer. This is also where you operate the analyzer and specify various settings.



1 Display
You can also use a touchscreen display (optional).

2 Keyboard

3 Mouse

4 Main unit

Information

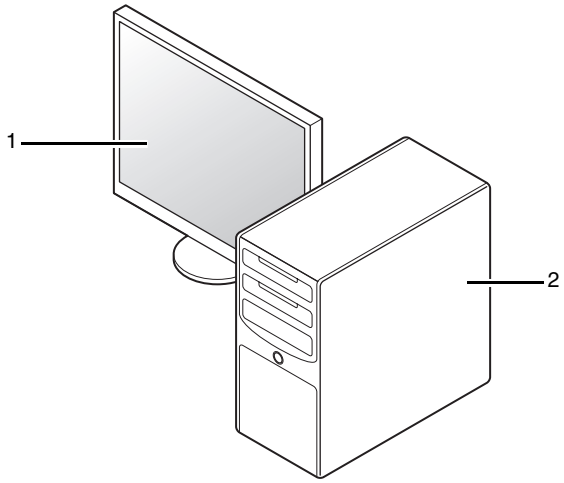
The above diagram is for reference only. Refer to the computer's manual for current operation, the layout of connection ports and other details.
For more information, please contact your local dealer or Sysmex Representative.

4.4 Transportation units

This section provides an external view and overview of the components of the transportation system. For an example of transportation system configuration, see Chapter 1. (➤**P.1-4** "Chapter 1: 1.2.3 Transportation system configuration")

4.4.1 Transportation controller (CT-90)

Instructs rack transportation and manages order information.



1 Touchscreen display
An LCD display with touchscreen operation support.

2 Main unit

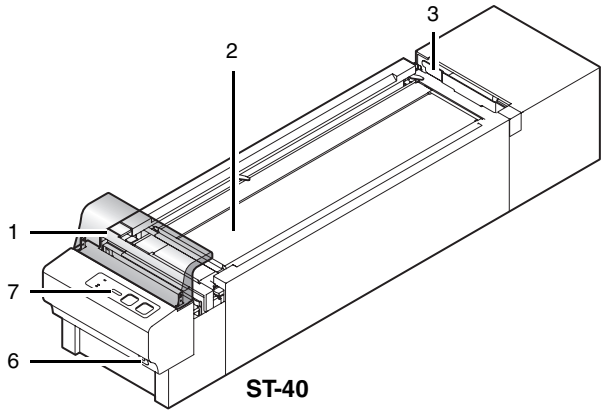
Information

The above diagram is for reference only. Refer to the computer's manual for current operation, the layout of connection ports and other details.
For more information, please contact your local dealer or Sysmex Representative.

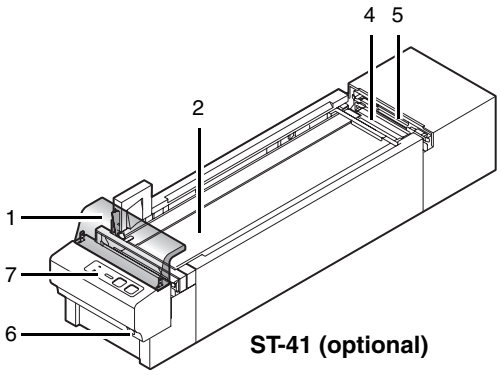
4.4.2 Start yard/Stock yard

Feeds and collects the racks. This is installed on the dedicated wagon (WG-40).

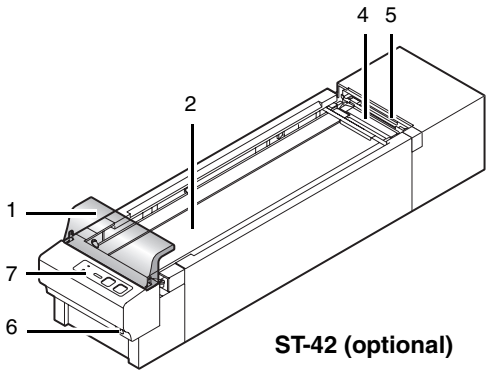
Front view



ST-40



ST-41 (optional)



ST-42 (optional)

1 Protective cover

A cover to protect the rack from contact with any object during transit. Open the cover when performing inspection.

2 Rack table

A maximum of 25 racks can be stocked.

Depending on your configuration the instrument, it can be used as a feeder section, collection section, or a conveyor route.

3 Sweep line

Feeds the rack to the next connected conveyor device.

4 Receiving line

Receives the rack from the conveyor device connected in front of it.

5 Rack feed-out lever

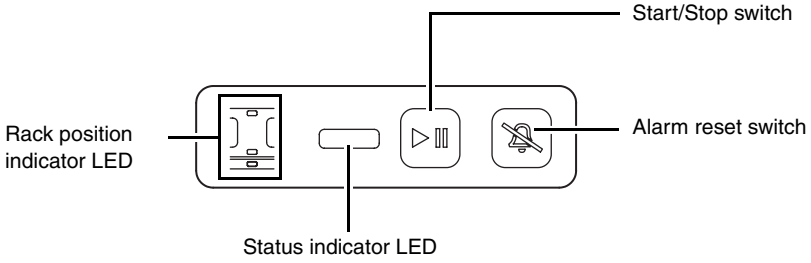
Feeds the rack that has reached the receiving line out to the rack table.

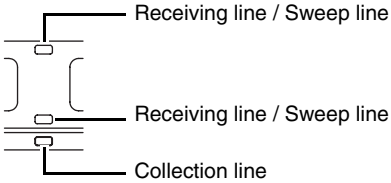
6 Startup switch

Turns the power of the device ON/OFF.

7 Control panel

Used to operate the start yard/stock yard.
Also displays the status of the device as well as the position of the rack.



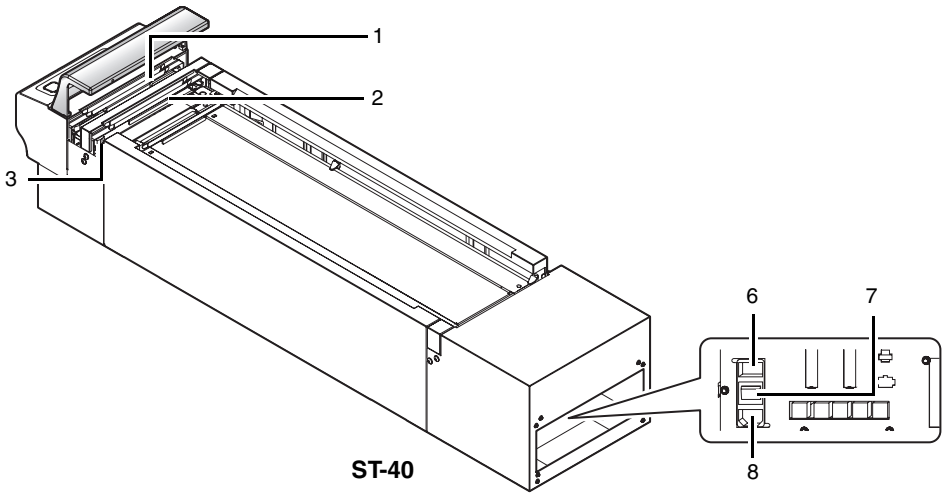
Start/Stop switch	Press to stop and resume the discharge of the racks. In addition, you can press this to resume the transport operation after an error has been resolved.
Alarm reset switch	Press to turn off the alarm sound.
Status indicator LED	Indicates the status of the device by LED.
Green	Ready
Flashing green	Operation in progress / Starting up / Shutting down
Orange	Paused
Flashing orange	Transitioning to a paused state
Red	Error (without alarm)
Flashing red	Error (with alarm)
Not lit	Powered OFF
Rack position indicator LED	When an error occurs, an orange LED indicates the probable location of the rack that needs to be removed. Each LED indicates a conveyor line.  If the ST for collection becomes full of racks, all LEDs light to notify you. The rack-full detected state is cleared when you remove 1 rack from the back, or 2 racks from the front.

● When using the optional external indicator light

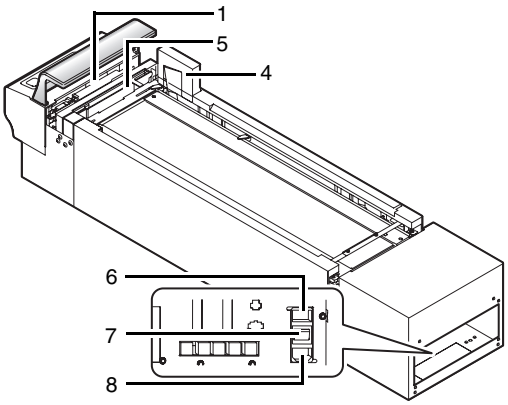
The external indicator light is linked to the instrument status LED, and indicates the status as follows.

Status indicator LED	Indicator light
Not lit	Not lit
Green	Green
Flashing green	
Orange	
Flashing orange	
Red	Red
Flashing red	

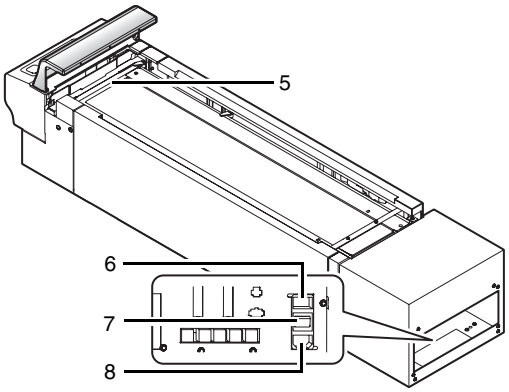
Rear view



ST-40



ST-41 (optional)



ST-42 (optional)

1 Collection line

Collects finished racks that have been analyzed.

2 Receiving line

Receives the rack from the conveyor device connected in front of it.

3 Rack feed-out lever

Feeds the rack that has reached the receiving line out to the rack table.

4 Rack barcode reader (optional)

Reads the rack number barcode attached to the rack.

5 Sweep line

Feeds the rack to the next connected conveyor device.

6 Fuse holder

Use a 250V 3.15A (Time Lag) fuse.

7 Main power switch

Turns the main power of the device ON/OFF.

Caution!

Do not turn this switch ON/OFF repeatedly within a short time.
This will overload the fuse and may cause it to blow.

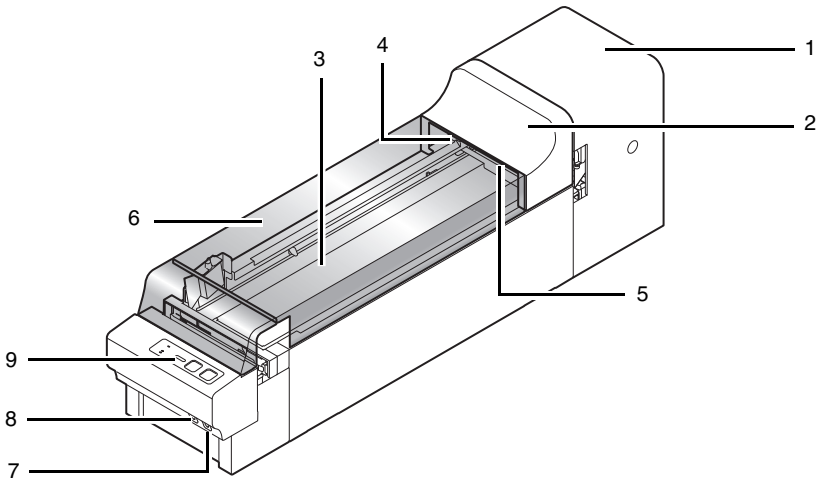
8 AC power inlet

Supplies power using the provided power cable.

4.4.3 Barcode terminal (BT-40)

Reads the rack number barcode and sample number barcode. This is installed on the dedicated wagon (WG-40).

Front view



1 Sample barcode reader section

Reads the barcode labels on the rack or the sample tubes in the rack.

2 The barcode reader cover

The barcode reader cover can be opened when performing inspections.
When opening this cover, you must remove the protective cover.
Cover open/close is detected by a sensor. When the cover is open, instrument operation stops.

3 Rack table

A maximum of 25 racks can be stocked.

4 Rack feed-out lever

Feeds the rack that has reached the feeder line out to the rack table.

5 Receiving line

Receives the rack from the conveyor device connected in front of it.

6 Protective cover

A cover to protect the rack from contact with any object during transit. Open the cover when performing inspection.

7 Startup switch

Turns BT ON/OFF.

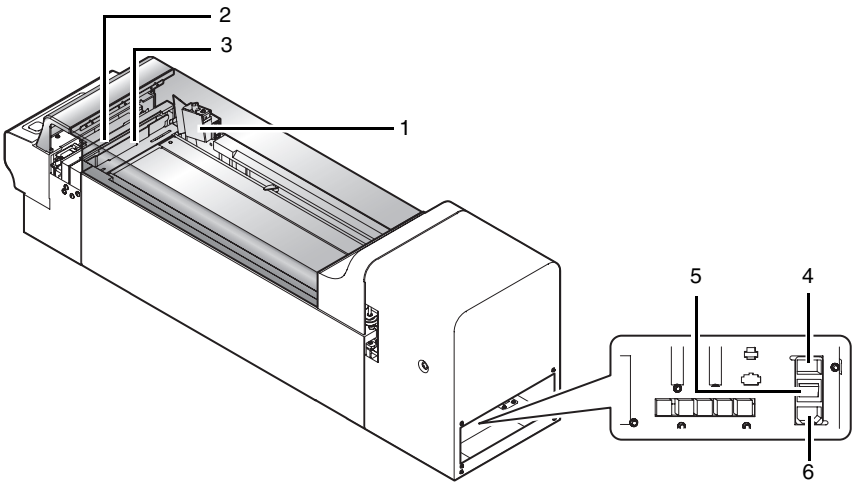
8 Master startup switch

Turns ON the power of the entire instrument at once. In addition, you can press this to turn OFF all transportation units.

9 Control panel

Same as the control panel for the start yard/stock yard.
(➤ **P.4-7** "4.4.2 Start yard/Stock yard")

Rear view



1 Rack barcode reader

Reads the rack number barcode attached to the rack.

2 Collection line

Collects finished racks that have been analyzed.

3 Sweep line

Feeds the rack to the next connected conveyor device.

4 Fuse holder

Use a 250V 4A (Time Lag) fuse.

5 Main power switch

Turns the main power of the device ON/OFF.

Caution!

Do not turn this switch ON/OFF repeatedly within a short time.
This will overload the fuse and may cause it to blow.

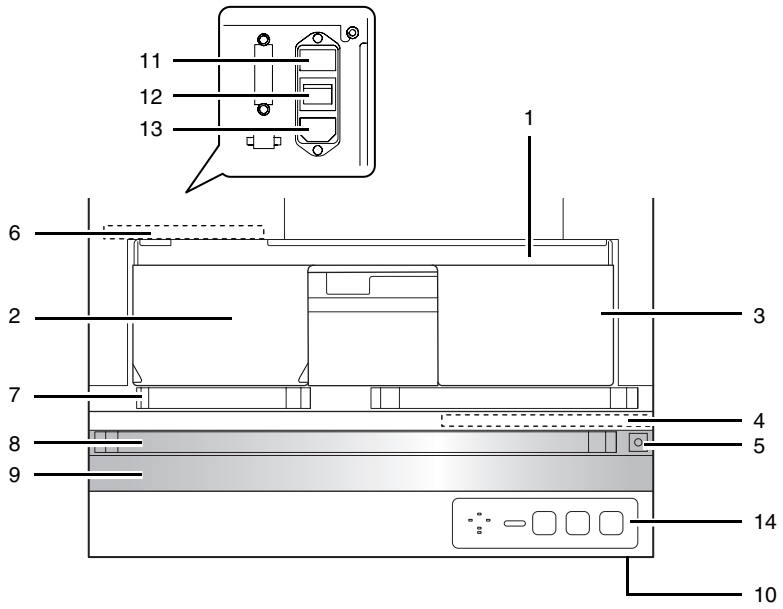
6 AC power inlet

Supplies power using the provided power cable.

4.4.4 XN conveyor (CV-50)

Automatically supplies the samples to the analyzer. This is installed on the dedicated wagon (WG-50).

Top view



1 Analysis line

The racks are transported laterally. In this line, the racks are checked for existence of any sample tube, and the samples are mixed and aspirated.

2 Left conveyor pool

Feeds the racks from the analysis line to the feeder line and the collection line.
When performing a off-line analysis (sampler analysis), the finished rack gets transported here.

3 Right conveyor pool

Takes the rack that was transported via the feeder line and feeds it to the analysis line.
Place the rack here when performing a off-line analysis (sampler analysis).

4 Rack feeder lever

Feeds the rack to the right conveyor pool.

5 Rack stopper

Stops the rack that was transported to the collection line.

6 Rack feed-out lever

Feeds the finished racks from the analysis line to the left conveyor pool.

7 Feeder line

Pulls in the rack from the conveyor device connected to its right side.
Also pushes the rack out to the conveyor device on its left.

8 Collection line

Collects finished racks that have been analyzed. In some transportation system configurations, racks are conveyed from the start yard.

9 Protective cover

A cover to protect the rack from contact with any object during transit. Open the cover when performing inspection.

10 Startup switch

Turns the power of the device ON/OFF.

11 Fuse holder

Use a 250V 3.15A (Time Lag) fuse.

12 Main power switch

Turns the main power of the device ON/OFF.

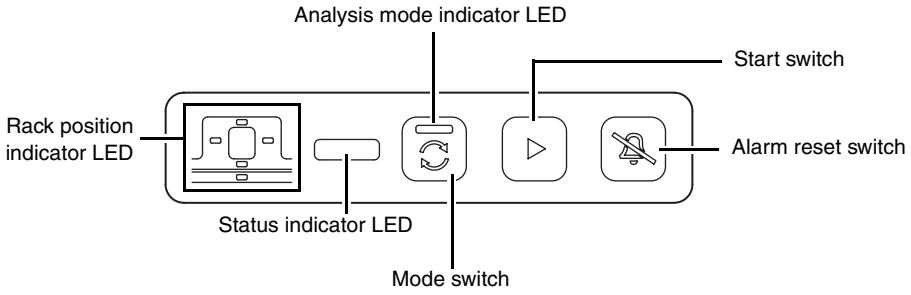
⚠ Caution!

Do not turn this switch ON/OFF repeatedly within a short time.
This will overload the fuse and may cause it to blow.

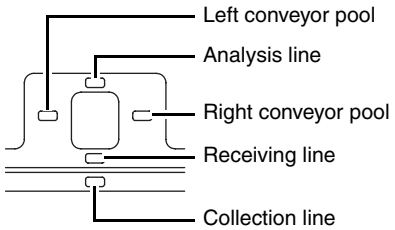
13 AC power inlet

Supplies power using the provided power cable.

14 Control panel



Start switch	Press to resume transporting after an error has been resolved. If a turn unit (TU-40) is connected before or after the conveyor, the switch can also be used for resuming the operation of the turn unit (TU-40).
Alarm reset switch	Press to turn off the alarm.
Mode switch	Press to switch between system analysis and off-line analysis modes.
Analysis mode indicator LED	Indicates the analysis mode by LED.
Green	System analysis
Flashing green	Service mode
Orange	Off-line analysis
Flashing orange	Transitioning to off-line analysis

Status indicator LED	Indicates the status of the device by LED.
Green	Ready
Flashing green	Operation in progress / Starting up / Shutting down
Orange	Paused
Flashing orange	Transitioning to a paused state
Red	Error (without alarm)
Flashing red	Error (with alarm)
Not lit	Powered OFF
Rack position indicator LED	When there is a rack for which analysis has been completed in off-line analysis (sampler analysis), or when an error occurs, an orange LED indicates the probable location of the rack that needs to be removed. Each LED indicates a conveyor line and left/right conveyor pools. If a turn unit (TU-40) is connected before or after the conveyor, when an error occurs in the retraction line/collection line of the turn unit (TU-40), the corresponding LED also turns ON. 

● When using the optional external indicator light

The external indicator light is linked to the instrument status LED, and indicates the status as follows.

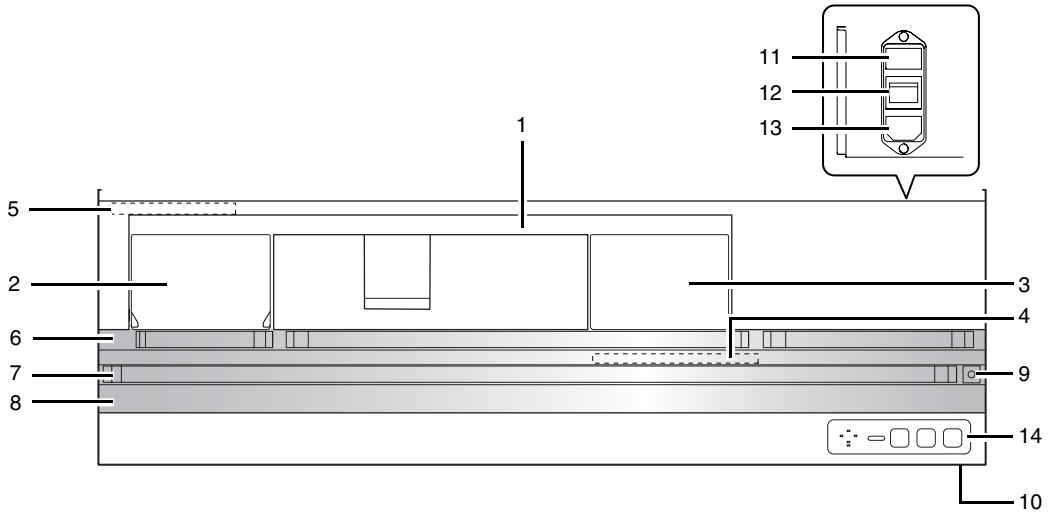
Status indicator LED	Indicator light
Not lit	Not lit
Green	Green*
Flashing green	
Orange*	
Flashing orange	
Red	Red
Flashing red	

* If a connected analyzer stops due to an error when the CV is running, the indicator light lights red.

4.4.5 SP conveyor (CV-60)

Automatically supplies the samples to the SP-10. This is installed on the dedicated wagon (WG-60).

Top view



1 Analysis line

The racks are transported laterally. In this line, the racks are checked for existence of any sample tube, and the samples are mixed and aspirated.

2 Left conveyor pool

Feeds the racks from the analysis line to the feeder line and the collection line.
When performing a off-line analysis (sampler analysis), the finished rack gets transported here.

3 Right conveyor pool

Takes the rack that was transported via the feeder line and feeds it to the analysis line.
Place the rack here when performing a off-line analysis (sampler analysis).

4 Rack feeder lever

Feeds the rack to the right conveyor pool.

5 Rack feed-out lever

Feeds the finished racks from the analysis line to the left conveyor pool.

6 Feeder line

Pulls in the rack from the conveyor device connected to its right side.
Also pushes the rack out to the conveyor device on its left.

7 Collection line

Collects finished racks that have been analyzed. In some transportation system configurations, racks are conveyed from the start yard.

8 Protective cover

A cover to protect the rack from contact with any object during transit. Open the cover when performing inspection.

9 Rack stopper

Stops the rack that was transported to the collection line.

10 Startup switch

Turns the power of the device ON/OFF.

11 Fuse holder

Use a 250V 3.15A (Time Lag) fuse.

12 Main power switch

Turns the main power of the device ON/OFF.

⚠ Caution!

Do not turn this switch ON/OFF repeatedly within a short time.
This will overload the fuse and may cause it to blow.

13 AC power inlet

Supplies power using the provided power cable.

14 Control panel

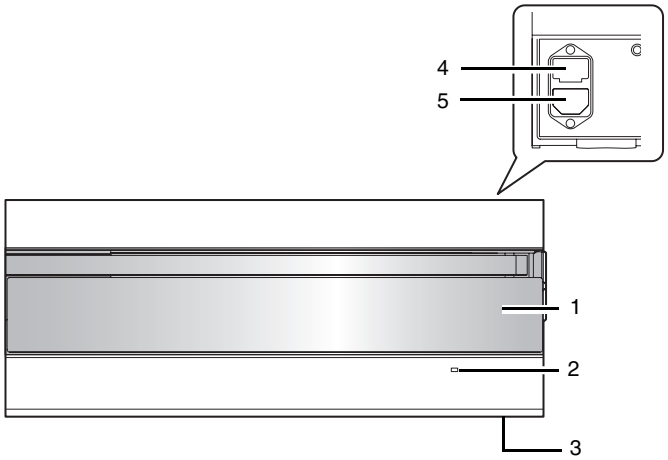
Same as XN conveyor (CV-50).

(➤**P.4-13** "4.4.4 XN conveyor (CV-50)")

4.4.6 Conveyor extension (CV-70)

An additional component that extends the transportation system. Extends the conveyor line when inserted between conveyor devices. The length can be adjusted in 5 steps. For details, contact your local Sysmex representative. This is installed on the dedicated wagon (WG-70).

Top view



1 Protective cover

A cover to protect the rack from contact with any object during transit. Open the cover when performing inspection.

2 Pilot lamp

Lights up when the instrument power is ON.

3 Main power switch

When set to the ON state, the instrument power turns ON/OFF in accordance with the power of the instruments connected before and after the instrument.

⚠ Caution!

Do not turn this switch ON/OFF repeatedly within a short time.
This will overload the fuse and may cause it to blow.

4 Fuse holder

Use a 250V 3.15A (Time Lag) fuse.

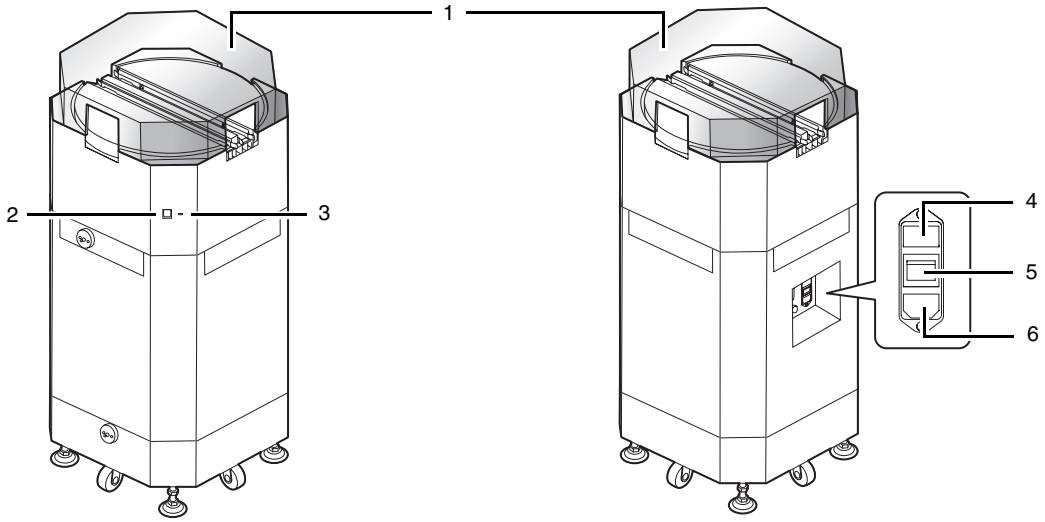
5 AC power inlet

Supplies power using the provided power cable.

4.4.7 Turn unit (TU-40)

An additional component that extends the transportation system. Used in configurations to allow line to turn 90° to the right or left.

Front view **Rear view**



1 Protective cover

A cover to protect the rack from contact with any object during transit. Open the cover when performing inspection.

2 Startup switch

Turn the power of the device ON/OFF.

3 Pilot lamp

Lights up when the instrument power is ON.

4 Fuse holder

Use a 250V 3.15A (Time Lag) fuse.

5 Main power switch

Turns the main power of the device ON/OFF.

⚠ Caution!

Do not turn this switch ON/OFF repeatedly within a short time.
This will overload the fuse and may cause it to blow.

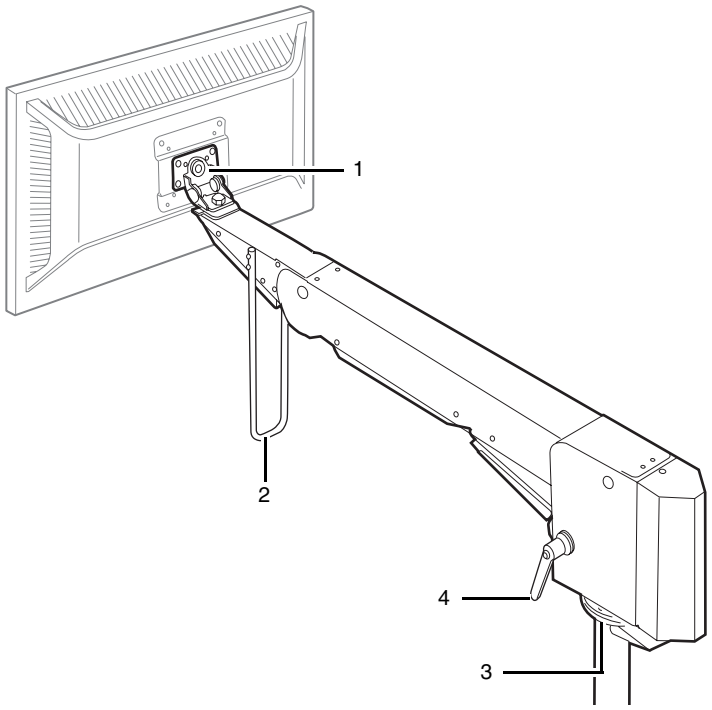
6 AC power inlet

Supplies power using the provided power cable.

4.4.8 Monitor arm (DA-10)

Option that allows the touch panel display to be operated close at hand.

Rear view



1 Display mounting part

The touch panel display is mounted on this part.

There are 3 axes of movement. The panel can be adjusted up and down, left and right, and the angle can be adjusted.

2 Handle

Use when moving the arm.

3 Monitor arm rotation mechanism

Rotates the monitor arm left and right.

4 Adjustment lever

The tightness of the monitor arm rotation mechanism can be adjusted.

Chapter 5 Reagents

This chapter explains the reagents to be used with this instrument.

5.1 General information

All reagents used in this instrument are exclusively for use with Sysmex equipment. Do not use them for any other purpose. Please follow the warnings for handling and using each of the reagents correctly.

5.2 CELLPACK DCL

General name

Whole blood diluent for use in hematology analyzers

Intended use

CELLPACK DCL is a reagent for measuring the numbers and sizes of RBC and platelets by the hydro dynamic focusing (DC Detection). With the addition of the specified lyse reagent for hemoglobin concentration determination, it can also be used to analyze hemoglobin concentration. Also it can be used as a sheath fluid for FCM detector.
This reagent is to be used by connecting to an automatic hematology analyzer specified by Sysmex.
Use as a diluent and sheath fluid for hematology analyzer and also used as a cleaning agent on the SP-10 device.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Caution!

1. The reliability of the analysis values cannot be guaranteed if the reagent is used outside of the written intended use, or not according to the written directions for use.
2. When replacing the reagent, do not refill and use the same container.
3. Handle the reagent with care to prevent air bubbles from forming. If air bubbles form, the analysis may not be performed normally.
4. Do not use expired reagents, as the reliability of the analysis values cannot be guaranteed.
5. If the reagent is removed after it has been connected (i.e. opened), it may become contaminated with bacteria and other particles, causing its performance to deteriorate. Therefore, reconnecting an open reagent is not recommended.
6. NEVER use this reagent on human body. Avoid contact with skin and eyes, and avoid ingestion. If it comes in contact with the skin, rinse skin thoroughly. If it gets in the eye, rinse with large amounts of water, and seek immediate medical attention. In the unlikely event that it was ingested, seek immediate medical attention.

Examination procedure

Use CELLPACK DCL at 15 - 30°C. If an analysis is performed at a temperature over 30°C or under 15°C, you may not be able to obtain accurate results. Connect the CELLPACK DCL container to the designated place on the instrument. For details, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")

Storage and shelf life after first opening

Store CELLPACK DCL at 2 - 35°C, away from direct sunlight. If the reagent has not been opened, it can be kept until the expiration date printed on the reagent container. For shelf life after opening (connecting to the instrument), refer to the expiration date printed on the reagent container or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications") Replace the reagent if it is showing signs of contamination or instability, such as cloudiness or discoloration. If frozen, thaw and mix thoroughly before use.

Disposal procedures

1. If crushing the container when disposing of fluid, make sure that any remaining fluid has been completely removed from the container before crushing.
2. Disposal procedures should meet requirements of applicable local regulations.

5.3 CELLPACK DST

General name

Concentrated diluent of reagent unit for use in hematology analyzers

Intended use

CELLPACK DST is a reagent for measuring the numbers and sizes of RBC and platelets by the hydro dynamic focusing (DC Detection). With the addition of the specified lyse reagent for hemoglobin concentration determination, it can also be used to analyze hemoglobin concentration. Also it can be used as a sheath fluid for FCM detector.
This reagent is to be used by connecting to a reagent preparation device specified by Sysmex.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Caution!

1. This reagent is a concentrated reagent. Use this reagent by connecting to a reagent preparation device specified by Sysmex.
2. The reliability of the analysis values cannot be guaranteed if the reagent is used outside of the written intended use, or not according to the written directions for use.
3. When replacing the reagent, do not refill and use the same container.
4. Handle the reagent with care to prevent air bubbles from forming. If air bubbles form, the analysis may not be performed normally.
5. Do not use expired reagents, as the reliability of the analysis values cannot be guaranteed.
6. If the reagent is removed after it has been connected (i.e. opened), it may become contaminated with bacteria and other particles, causing its performance to deteriorate. Therefore, reconnecting an open reagent is not recommended.
7. NEVER use this reagent on human body. Avoid contact with skin and eyes, and avoid ingestion. If it comes in contact with the skin, rinse skin thoroughly. If it gets in the eye, rinse with large amounts of water, and seek immediate medical attention. In the unlikely event that it was ingested, seek immediate medical attention.

Examination procedure

Use CELLPACK DST at 15 - 30°C. If an analysis is performed at a temperature over 30°C or under 15°C, you may not be able to obtain accurate results. Connect the CELLPACK DST container to the designated place on the reagent preparation device. For details, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")

Storage and shelf life after first opening

Store CELLPACK DST at 2 - 35°C, away from direct sunlight. If the reagent has not been opened, it can be kept until the expiration date printed on the reagent container. For shelf life after opening (connecting to the instrument), refer to the expiration date printed on the reagent container or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications") Replace the reagent if it is showing signs of contamination or instability, such as cloudiness or discoloration. Do not use a reagent that is suspected to have frozen.

Disposal procedures

1. If crushing the container when disposing of fluid, make sure that any remaining fluid has been completely removed from the container before crushing.
2. Disposal procedures should meet requirements of applicable local regulations.

5.4 CELLPACK DFL

General name

Whole blood diluent for use in hematology analyzers

Intended use

CELLPACK DFL is a reagent used in combination with Fluorocell RET for the analysis of reticulocytes or with Fluorocell PLT for the analysis of platelets by flow cytometry method using a semiconductor laser. This reagent is to be used by connecting to an automatic hematology analyzer specified by Sysmex.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Caution!

1. The reliability of the analysis values cannot be guaranteed if the reagent is used outside of the written intended use, or not according to the written directions for use.
2. This reagent is to be combined and used with Fluorocell RET or Fluorocell PLT. When replacing this reagent, do not refill and use the same container.
3. Handle the reagent with care to prevent air bubbles from forming. If air bubbles form, the analysis may not be performed normally.
4. Do not use expired reagents, as the reliability of the analysis values cannot be guaranteed.
5. If the reagent is removed after it has been connected (i.e. opened), it may become contaminated with bacteria and other particles, causing its performance to deteriorate. Therefore, reconnecting an open reagent is not recommended.
6. NEVER use this reagent on human body. Avoid contact with skin and eyes, and avoid ingestion. If it comes in contact with the skin, rinse skin thoroughly. If it gets in the eye, rinse with large amounts of water, and seek immediate medical attention. In the unlikely event that it was ingested, seek immediate medical attention.

Examination procedure

Use CELLPACK DFL at 15 - 30°C. If an analysis is performed at a temperature over 30°C or under 15°C, you may not be able to obtain an accurate count of reticulocytes and platelets. Connect the CELLPACK DFL container to the designated place on the instrument. For details, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")

Storage and shelf life after first opening

Store CELLPACK DFL at 2 - 35°C, away from direct sunlight. If the reagent has not been opened, it can be kept until the expiration date printed on the reagent container. For shelf life after opening (connecting to the instrument), refer to the expiration date printed on the reagent container or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications") Replace the reagent if it is showing signs of contamination or instability, such as cloudiness or discoloration. Do not use a reagent that is suspected to have frozen.

Disposal procedures

1. If crushing the container when disposing of fluid, make sure that any remaining fluid has been completely removed from the container before crushing.
2. Disposal procedures should meet requirements of applicable local regulations.

5.5 SULFOLYSER

General name

A reagent for the automated determination of hemoglobin concentration of blood

Intended use

SULFOLYSER is a reagent for the automated determination of hemoglobin concentration of blood. SULFOLYSER is manufactured for use on all Sysmex automated hematology analyzers. SULFOLYSER cannot be used on semi-automated instruments.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Caution!

Avoid contact with skin and eyes. In case of skin contact, flush the area with water. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. If swallowed, seek medical advice immediately.

Examination procedure

1. Allow the container of SULFOLYSER to equilibrate to environmental temperature (15 - 30°C).
2. Loosen and remove the cap on the SULFOLYSER container.
3. Attach the Dispenser Kit to the SULFOLYSER container. Tighten the cap. Connect the SULFOLYSER line from the instrument to the Dispenser Kit.
4. Prime the SULFOLYSER through the hydraulic system of the instrument by cycling the instrument several times in the whole blood mode to fill all SULFOLYSER tubing with reagent and to remove air bubbles in the lines.

For details, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")

Storage and shelf life after first opening

Store SULFOLYSER at 1 - 30°C, away from direct sunlight. If the reagent has not been opened, it can be kept until the expiration date printed on the reagent container. For shelf life after opening (connecting to the instrument), refer to the expiration date printed on the reagent container or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications") Replace the reagent if it is showing signs of contamination or instability, such as cloudiness or discoloration. Do not use a reagent that is suspected to have frozen.

Disposal procedures

1. If crushing the container when disposing of fluid, make sure that any remaining fluid has been completely removed from the container before crushing.
2. Disposal procedures should meet requirements of applicable local regulations.

5.6 Lysercell WNR

General name

A lysing reagent for hematology analyzers

Intended use

Lysercell WNR is a reagent product to be combined and used with Fluorocell WNR. By hemolyzing red blood cells with Lysercell WNR and by differentiating white blood cells (non-basophil), basophils, and nucleated red blood cells with Lysercell WNR and Fluorocell WNR, the white blood cell count, basophil count, basophil percentage, nucleated red blood cell count, and nucleated red blood cell percentage are analyzed. This reagent is to be used by connecting to an automatic hematology analyzer specified by Sysmex.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Caution!

1. The reliability of the analysis values cannot be guaranteed if the reagent is used outside of the written intended use, or not according to the written directions for use.
2. This reagent is to be combined and used with Fluorocell WNR. When replacing this reagent, do not refill and use the same container.
3. Handle the reagent with care to prevent air bubbles from forming. If air bubbles form, the analysis may not be performed normally.
4. Do not use expired reagents, as the reliability of the analysis values cannot be guaranteed.
5. If the reagent is removed after it has been connected (i.e. opened), it may become contaminated with bacteria and other particles, causing its performance to deteriorate. Therefore, reconnecting an open reagent is not recommended.
6. NEVER use this reagent on human body. Avoid contact with skin and eyes, and avoid ingestion. If it comes in contact with the skin, rinse skin thoroughly. If it gets in the eye, rinse with large amounts of water, and seek immediate medical attention. In the unlikely event that it was ingested, seek immediate medical attention.

Examination procedure

Use Lysercell WNR at 15 - 30°C. If an analysis is performed at a temperature over 30°C or under 15°C, you may not be able to obtain accurate white blood cell count, basophil count, basophil percentage, nucleated red blood cell count, and nucleated red blood cell percentage. Connect the Lysercell WNR container to the designated place on the instrument. For details, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")

Storage and shelf life after first opening

Store Lysercell WNR at 2 - 35°C, away from direct sunlight. If the reagent has not been opened, it can be kept until the expiration date printed on the reagent container. For shelf life after opening (connecting to the instrument), refer to the expiration date printed on the reagent container or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications") Replace the reagent if it is showing signs of contamination or instability, such as cloudiness or discoloration. Do not use a reagent that is suspected to have frozen.

Disposal procedures

1. If crushing the container when disposing of fluid, make sure that any remaining fluid has been completely removed from the container before crushing.
2. Disposal procedures should meet requirements of applicable local regulations.

5.7 Lysercell WDF

General name

A lysing reagent for hematology analyzers

Intended use

Lysercell WDF is a reagent product to be combined and used with Fluorocell WDF. By hemolyzing red blood cells with Lysercell WDF and dyeing the white blood cell component with Fluorocell WDF, the counts and percentages of neutrophils, lymphocytes, monocytes, and eosinophils are analyzed. This reagent is to be used by connecting to an automatic hematology analyzer specified by Sysmex.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Caution!

1. The reliability of the analysis values cannot be guaranteed if the reagent is used outside of the written intended use, or not according to the written directions for use.
2. This reagent is to be combined and used with Fluorocell WDF. When replacing this reagent, do not refill and use the same container.
3. Handle the reagent with care to prevent air bubbles from forming. If air bubbles form, the analysis may not be performed normally.
4. Do not use expired reagents, as the reliability of the analysis values cannot be guaranteed.
5. If the reagent is removed after it has been connected (i.e. opened), it may become contaminated with bacteria and other particles, causing its performance to deteriorate. Therefore, reconnecting an open reagent is not recommended.
6. NEVER use this reagent on human body. Avoid contact with skin and eyes, and avoid ingestion. If it comes in contact with the skin, rinse skin thoroughly. If it gets in the eye, rinse with large amounts of water, and seek immediate medical attention. In the unlikely event that it was ingested, seek immediate medical attention.

Examination procedure

Use Lysercell WDF at 15 - 30°C. If an analysis is performed at a temperature over 30°C or under 15°C, you may not be able to obtain accurate counts and percentages of neutrophils, lymphocytes, monocytes, and eosinophils. Connect the Lysercell WDF container to the designated place on the instrument. For details, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")

Storage and shelf life after first opening

Store Lysercell WDF at 2 - 35°C, away from direct sunlight. If the reagent has not been opened, it can be kept until the expiration date printed on the reagent container. For shelf life after opening (connecting to the instrument), refer to the expiration date printed on the reagent container or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications") Replace the reagent if it is showing signs of contamination or instability, such as cloudiness or discoloration. Do not use a reagent that is suspected to have frozen.

Disposal procedures

1. If crushing the container when disposing of fluid, make sure that any remaining fluid has been completely removed from the container before crushing.
2. Disposal procedures should meet requirements of applicable local regulations.

5.8 Lysercell WPC

General name

A lysing reagent for hematology analyzers

Intended use

Lysercell WPC is a reagent product to be combined and used with Fluorocell WPC. Lysercell WPC hemolyzes red blood cells, and Lysercell WPC and Fluorocell WPC detect any presence of abnormal or immature cells. This reagent is to be used by connecting to an automatic hematology analyzer specified by Sysmex.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Caution!

1. The reliability of the analysis values cannot be guaranteed if the reagent is used outside of the written intended use, or not according to the written directions for use.
2. This reagent is to be combined and used with Fluorocell WPC. When replacing this reagent, do not refill and use the same container.
3. Handle the reagent with care to prevent air bubbles from forming. If air bubbles form, the analysis may not be performed normally.
4. Do not use expired reagents, as the reliability of the analysis values cannot be guaranteed.
5. If the reagent is removed after it has been connected (i.e. opened), it may become contaminated with bacteria and other particles, causing its performance to deteriorate. Therefore, reconnecting an open reagent is not recommended.
6. NEVER use this reagent on human body. Avoid contact with skin and eyes, and avoid ingestion. If it comes in contact with the skin, rinse skin thoroughly. If it gets in the eye, rinse with large amounts of water, and seek immediate medical attention. In the unlikely event that it was ingested, seek immediate medical attention.

Examination procedure

Use Lysercell WPC at 15 - 30°C. If an analysis is performed at a temperature over 30°C or under 15°C, you may not be able to accurately detect the presence of abnormal or immature cells. Connect the Lysercell WPC container to the designated place on the instrument. For details, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")

Storage and shelf life after first opening

Store Lysercell WPC at 2 - 35°C, away from direct sunlight. If the reagent has not been opened, it can be kept until the expiration date printed on the reagent container. For shelf life after opening (connecting to the instrument), refer to the expiration date printed on the reagent container or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications") Replace the reagent if it is showing signs of contamination or instability, such as cloudiness or discoloration. Do not use a reagent that is suspected to have frozen.

Disposal procedures

1. If crushing the container when disposing of fluid, make sure that any remaining fluid has been completely removed from the container before crushing.
2. Disposal procedures should meet requirements of applicable local regulations.

5.9 Fluorocell WNR

General name

A staining reagent for hematology analyzers

Intended use

Fluorocell WNR is to be used to stain the nucleated cells in diluted and lysed blood samples for determination of white blood cell count, nucleated red blood cell count and basophil count in blood with Sysmex automated hematology analyzers.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Caution!

1. Wear gloves and a lab coat for protection. Avoid contact with skin and eyes.
2. In case of skin contact, rinse immediately with plenty of soap and water.
3. In case of contact with eyes, rinse immediately with water or normal saline, occasionally lifting upper and lower lids until no evidence of dye remains. Obtain medical attention.
4. If swallowed, seek medical advice immediately.
5. In case of accident or you feel unwell, seek medical advice immediately (show the label where possible).

R22: Harmful if swallowed.
Sysmex products are labeled with Hazard Symbol and Risk and Safety Phrases in compliance with the European Community Directive.

Examination procedure

1. Put a Fluorocell WNR cartridge in the prescribed position and then connect the Fluorocell WNR line.
2. Do not remove the IC tag until disposal. All the product information is managed by the IC tag on the label.
3. After setting, reset of the package is not recommended. Removing the reagent cartridge from the analyzer may cause deterioration of the reagent by contamination and opening in a sealing film.

For details, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")

Storage and shelf life after first opening

Store Fluorocell WNR in a dark place at 2 - 35°C. If the reagent has not been opened, it can be kept until the expiration date printed on the reagent container. For shelf life after opening (connecting to the instrument), refer to the expiration date printed on the package insert or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications") Do not use a reagent that is suspected to have frozen.

Disposal procedures

1. Tightly seal the spout of a cartridge before disposing to prevent residual reagent solution leaks. You may use tape to secure the spout.
2. Disposal procedures should meet requirements of applicable local regulations.

5.10 Fluorocell WDF

General name

A staining reagent for hematology analyzers

Intended use

Fluorocell WDF is to be used to stain the leukocytes in diluted and lysed blood samples for determination of 4-part differential count in blood with Sysmex automated hematology analyzers.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Caution!

1. Wear gloves and a lab coat for protection. Avoid contact with skin and eyes.
2. In case of skin contact, rinse immediately with plenty of soap and water.
3. In case of contact with eyes, rinse immediately with water or normal saline, occasionally lifting upper and lower lids until no evidence of dye remains. Obtain medical attention.
4. If swallowed, seek medical advice immediately.
5. Do not breathe vapor. In case of accident or you feel unwell, seek medical advice immediately (show the label where possible).

R20/21/22: Harmful by inhalation, in contact with skin and if swallowed.
R68/20/21/22: Harmful: possible risk of irreversible effects through inhalation, in contact with skin and if swallowed.
S23: Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
S24/25: Avoid contact with skin and eyes.
S37/39: Wear suitable gloves and eye/face protection.
S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Sysmex products are labeled with Hazard Symbol and Risk and Safety Phrases in compliance with the European Community Directive.

Examination procedure

1. Put a Fluorocell WDF cartridge in the prescribed position and then connect the Fluorocell WDF line.
2. Do not remove the IC tag until disposal. All the product information is managed by the IC tag on the label.
3. After setting, reset of the package is not recommended. Removing the reagent cartridge from the analyzer may cause deterioration of the reagent by contamination and opening in a sealing film.

For details, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")

Storage and shelf life after first opening

Store Fluorocell WDF in a dark place at 2 - 35°C. If the reagent has not been opened, it can be kept until the expiration date printed on the package insert. For shelf life after opening (connecting to the instrument), refer to the expiration date printed on the package insert or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications") Do not use a reagent that is suspected to have frozen.

Disposal procedures

1. Tightly seal the spout of a cartridge before disposing to prevent residual reagent solution leaks. You may use tape to secure the spout.
2. Disposal procedures should meet requirements of applicable local regulations.

5.11 Fluorocell RET

General name

A staining reagent for hematology analyzers

Intended use

Fluorocell RET is to be used to stain the reticulocytes in diluted blood sample for the assay of reticulocyte count, reticulocyte percent and platelet count in blood with Sysmex automated hematology analyzers.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Caution!

1. Wear gloves and a lab coat for protection. Avoid contact with skin and eyes.
2. In case of skin contact, rinse immediately with plenty of soap and water.
3. In case of contact with eyes, rinse immediately with water or normal saline, occasionally lifting upper and lower lids until no evidence of dye remains. Obtain medical attention.
4. If swallowed, seek medical advice immediately.
5. Do not breathe vapor. In case of accident or you feel unwell, seek medical advice immediately (show the label where possible).

R10: Flammable.
R20/21/22: Harmful by inhalation, in contact with skin and if swallowed.
R68/20/21/22: Harmful: possible risk of irreversible effects through inhalation, in contact with skin and if swallowed.
R16: Keep away from sources of ignition – No smoking.
S23: Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
S24/25: Avoid contact with skin and eyes.
S37/39: Wear suitable gloves and eye/face protection.
S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Sysmex products are labeled with Hazard Symbol and Risk and Safety Phrases in compliance with the European Community Directive.

Examination procedure

1. Put a Fluorocell RET cartridge in the prescribed position and then connect the Fluorocell RET line.
2. Do not remove the IC tag until disposal. All the product information is managed by the IC tag on the label.
3. After setting, reset of the package is not recommended. Removing the reagent cartridge from the analyzer may cause deterioration of the reagent by contamination and opening in a sealing film.

For details, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")

Storage and shelf life after first opening

Store Fluorocell RET in a dark place at 2 - 35°C. If the reagent has not been opened, it can be kept until the expiration date printed on the package insert. For shelf life after opening (connecting to the instrument), refer to the expiration date printed on the package insert or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications") Do not use a reagent that is suspected to have frozen.

Disposal procedures

1. Tightly seal the spout of a cartridge before disposing to prevent residual reagent solution leaks. You may use tape to secure the spout.
2. Disposal procedures should meet requirements of applicable local regulations.

5.12 Fluorocell PLT

General name

A staining reagent for hematology analyzers

Intended use

Fluorocell PLT is to be used to stain the platelet in diluted blood sample for the assay of platelet count in blood with Sysmex automated hematology analyzers.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Caution!

1. Wear gloves and a lab coat for protection. Avoid contact with skin and eyes.
2. In case of skin contact, rinse immediately with plenty of soap and water.
3. In case of contact with eyes, rinse immediately with water or normal saline, occasionally lifting upper and lower lids until no evidence of dye remains. Obtain medical attention.
4. If swallowed, seek medical advice immediately.
5. In case of accident or you feel unwell, seek medical advice immediately (show the label where possible).

R22: Harmful if swallowed.

Sysmex products are labeled with Hazard Symbol and Risk and Safety Phrases in compliance with the European Community Directive.

Examination procedure

1. Put a Fluorocell PLT cartridge in the prescribed position and then connect the Fluorocell PLT line.
2. Do not remove the IC tag until disposal. All the product information is managed by the IC tag on the label.
3. After setting, reset of the package is not recommended. Removing the reagent package from the analyzer may cause deterioration of the reagent by contamination and opening in a sealing film.

For details, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")

Storage and shelf life after first opening

Store Fluorocell PLT in a dark place at 2 - 35°C. If the reagent has not been opened, it can be kept until the expiration date printed on the package insert. For shelf life after opening (connecting to the instrument), refer to the expiration date printed on the package insert or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications") Do not use a reagent that is suspected to have frozen.

Disposal procedures

1. Tightly seal the spout of a cartridge before disposing to prevent residual reagent solution leaks. You may use tape to secure the spout.
2. Disposal procedures should meet requirements of applicable local regulations.

5.13 Fluorocell WPC

General name

A staining reagent for hematology analyzers

Intended use

Fluorocell WPC is to be used to stain the leukocytes in diluted and lysed blood samples for detection of various immature cells in blood with Sysmex automated hematology analyzers.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Caution!

1. Wear gloves and a lab coat for protection. Avoid contact with skin and eyes.
2. In case of skin contact, rinse immediately with plenty of soap and water.
3. In case of contact with eyes, rinse immediately with water or normal saline, occasionally lifting upper and lower lids until no evidence of dye remains. Obtain medical attention.
4. If swallowed, seek medical advice immediately.
5. Do not breathe vapor. In case of accident or you feel unwell, seek medical advice immediately (show the label where possible).

R10: Flammable.
R22: Harmful if swallowed.
S16: Keep away from sources of ignition – No smoking.
S24/25: Avoid contact with skin and eyes.
S37: Wear suitable gloves.
S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Sysmex products are labeled with Hazard Symbol and Risk and Safety Phrases in compliance with the European Community Directive.

Examination procedure

1. Put a Fluorocell WPC cartridge in the prescribed position and then connect the Fluorocell WPC line.
2. Do not remove the IC tag until disposal. All the product information is managed by the IC tag on the label.
3. After setting, reset of the package is not recommended. Removing the reagent cartridge from the analyzer may cause deterioration of the reagent by contamination and opening in a sealing film.

For details, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")

Storage and shelf life after first opening

Store Fluorocell WPC in a dark place at 2 - 35°C. If the reagent has not been opened, it can be kept until the expiration date printed on the package insert. For shelf life after opening (connecting to the instrument), refer to the expiration date printed on the package insert or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications") Do not use a reagent that is suspected to have frozen.

Disposal procedures

1. Tightly seal the spout of a cartridge before disposing to prevent residual reagent solution leaks. You may use tape to secure the spout.
2. Disposal procedures should meet requirements of applicable local regulations.

5.14 CELLCLEAN AUTO

General name

Detergent for fully automated hematology analyzer

Intended use

CELLCLEAN AUTO is to be used as a strong alkaline detergent to remove SYSMEX lysing reagent, cellular residuals and blood proteins remaining in the hydraulics of XN series automated hematology analyzer and SP-10 automated hematology slide preparation unit.

Warnings and precautions (for in vitro diagnostic use only)

⚠ Warning!

Avoid contact with skin and eyes. In case of skin contact, flush the area with water. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice immediately.
R31: Contact with acids liberates toxic gas.
R36/38: Irritating to eyes and skin.
S2: Keep out of the reach of children.
S25: Avoid contact with eyes.
Sysmex products are labeled with Hazard Symbol and Risk and Safety Phrases in compliance with the European Community Directive.

Storage and shelf life after first opening

Store CELLCLEAN AUTO at 1 - 30°C, away from direct sunlight.
Do not use a reagent that is suspected to have frozen.

Disposal procedures

1. After use, there will be a hole in the film that seals the top of the tube. Exercise caution, as residual fluid may leak from the hole.
2. Disposal procedures should meet requirements of applicable local regulations.

5.15 Control blood (XN CHECK/XN CHECK BF)

Intended use

Used to controlling the quality of hematology analyzers.

Warnings and precautions (for in vitro diagnostic use only)

Risk of infection

Always wear protective garments and gloves when using control blood. Also, wash your hands after completing the process.
The basic blood used in the control blood has tested negative for HBs antigen, HCV/HIV-1/HIV-2 antibodies, and serologic tests for syphilis. However, there are no tests that can completely rule out any infections. In addition, it has not been tested for other viruses. Therefore, handle it with the same level of care you would use when handling other blood samples that may be infectious.

Storage and shelf life after first opening

Store the control blood in a dark refrigerated place at 2 - 8°C.
If it has not been opened, you can keep it until the expiration date printed on the vial label and outer box.
For shelf life after opening, refer to the expiration date printed on the package insert or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications")

5.16 Calibrator (XN CAL/XN CAL PF)

Intended use

Use the XN CAL for the calibration of the instrument for WBC, RBC, HGB, HCT, PLT, and RET.
Use the XN CAL PF for the calibration of the instrument for PLT-F (platelet count obtained from the PLT-F channel).

Warnings and precautions (for in vitro diagnostic use only)

Risk of infection

Always wear protective garments and gloves when using control blood. Also, wash your hands after completing the process.
The basic blood used in the calibrator has tested negative for HBs antigen, HCV/HIV-1/HIV-2 antibodies, and serologic tests for syphilis. However, there are no tests that can completely rule out any infections. In addition, it has not been tested for other viruses. Therefore, handle it with the same level of care you would use when handling other blood samples that may be infectious.

Storage and shelf life after first opening

Store the calibrator in a dark refrigerated place at 2 - 8°C.
If it has not been opened, you can keep it until the expiration date printed on the vial label and outer box.
For shelf life after opening, refer to the expiration date printed on the package insert or reagents specifications. (➤**P.5-17** "5.18 Table of reagent specifications")

5.17 Symbols used on the labels

Signs and symbols used on reagent containers and packages are as follows:

> **Caution!**
> Important information about the handling of reagents is noted on their containers or the package insert. Use the reagents after fully understanding the descriptions.

	Harmful (Hazardous class in the EU)		Catalogue number
	Corrosive (Hazardous class in the EU)		Concentrated reagent
	In vitro diagnostic medical device		Keep away from sunlight
	Manufacturer		Use no hooks
	Authorised Representative in the European Community		This way up
	Consult instructions for use		Keep away from rain
	Temperature limitation		Stacking limit by number
	Biological risks		Fragile; handle with care
	Use by		Corrugated recycles
	Batch code		

The design of the symbols may differ from the actual product.

5.18 Table of reagent specifications

5.18.1 Table of reagent specifications

Brand name	Volume	Storage temp.	Usage temp.	Shelf life after opening	Composition
CELLPACK DCL	20 L	2 - 35°C	15 - 30°C	60 days	Sodium chloride 0.7% Tris buffer 0.2% EDTA-2K 0.02%
	10 L				
CELLPACK DST	20 L			60 days	Sodium chloride 15.7% Tris buffer 4.3% EDTA-2K 0.4%
	10 L				
	4 L				
CELLPACK DFL	1.5 L			60 days	Tricine buffer 0.17%
SULFOLYSER*	1.5 L	1 - 30°C		60 days	Sodium lauryl sulfate 1.8 g/L
	4 L			90 days	
	5 L				
Lysercell WNR	4 L	2 - 35°C		60 days	Organic quaternary ammonium salts 0.20% Nonionic surfactant 0.10%
Lysercell WDF	4 L			90 days	Organic quaternary ammonium salts 0.07% Nonionic surfactant 0.17%
Lysercell WPC	1.5 L			90 days	Anionic surfactant 0.03% Nonionic surfactant 0.12%
Fluorocell WNR	82 mL			90 days	Polymethine dye 0.005% Ethylene glycol 99.9%
Fluorocell WDF	42 mL			90 days	Polymethine dye 0.002% Methanol 3.0% Ethylene glycol 96.9%
Fluorocell RET	12 mL			90 days	Polymethine dye 0.03% Methanol 7.9% Ethylene glycol 92.0%
Fluorocell PLT	12 mL			90 days	Oxazine dye 0.003% Ethylene glycol 99.9%
Fluorocell WPC	12 mL			90 days	Polymethine dye 0.004% Ethanol 15.1% Ethylene glycol 84.8%
CELLCLEAN AUTO	4 mL	1 - 30°C		-	Sodium Hypochlorite (available chlorine concentration 5.0%)

* Available reagent package sizes may vary in some regions. For more details please contact your local Sysmex representative.

5.18.2 Table of control blood/calibrator specifications

Brand name	Volume	Storage temp.	Usage temp.	Shelf life after opening
XN CHECK	3.0 mL	2 - 8°C	15 - 30°C	7 days
XN CHECK BF	3.0 mL			30 days
XN CAL	3.0 mL			4 hours
XN CAL PF	3.0 mL			

Chapter 6 Basic Operation

This chapter explains the basic operation of this instrument.

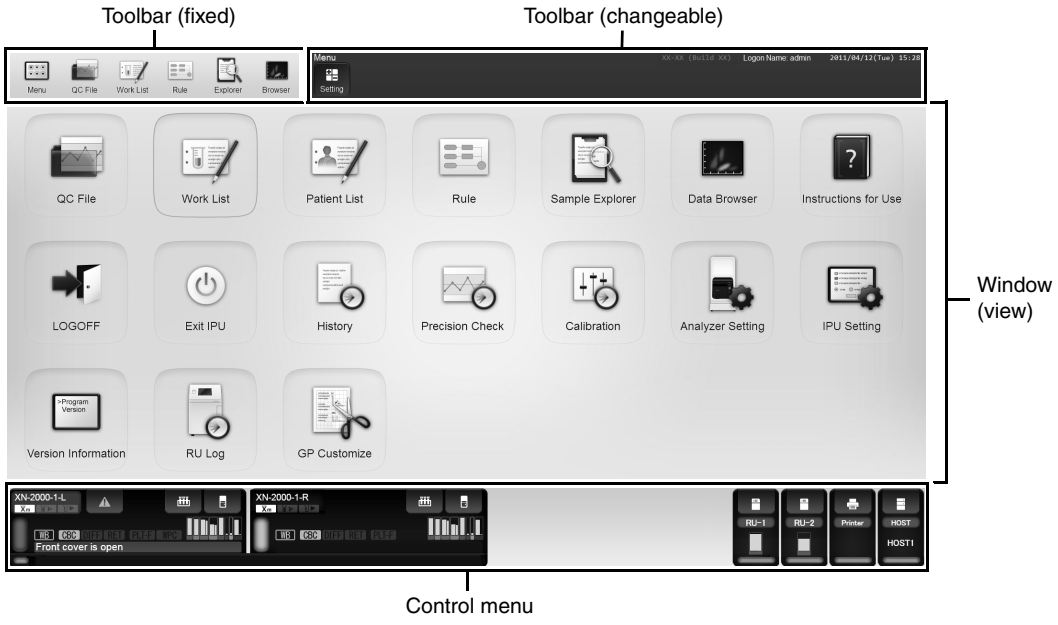
6.1 Operation of the IPU

The operation of the IPU is based on Windows. For information on how to perform Windows, see the user's manual or the help system of the operating system.
The commonly used functions of the IPU are accessible via the touchscreen. If you are using a touchscreen display (optional), you can operate the IPU by directly touching the display.

⚠ Caution!
The IPU is a dedicated PC for the instrument, and cannot be used as a generic PC.

6.1.1 Main screen layout

The basic screen layout of the IPU is as follows



Toolbar (fixed)	The following frequently-used function buttons are displayed:
[Menu]	Click to return from each function screen to the Menu screen.
[QC File]	Click to display the QC File screen.
[Work List]	Click to display the Work List screen.
[Rule]	Click to display the Rule screen.

[Explorer]	Click to display the Sample Explorer.
[Browser]	Click to display the Data Browser.
Toolbar (changeable)	Buttons are displayed according to the displayed function of the window. While performing each function, clicking the [Close] button displayed on the right edge closes each function screen displayed on in the window.
Window (view)	Area for performing various types of processes and operations. By default, the Menu screen is displayed. Click the desired icon to execute its function. (➤**P.6-7** "6.1.3 List of menu items") You can change the icons to be displayed in the Menu screen. Click the [Settings] button on the toolbar to select the icons to be displayed. Icons that are hidden in the menu screen are also hidden on the toolbar.
Control menu	Displays the status of each device connected to the IPU. In addition, you can perform operations on each device, such as analysis and maintenance.

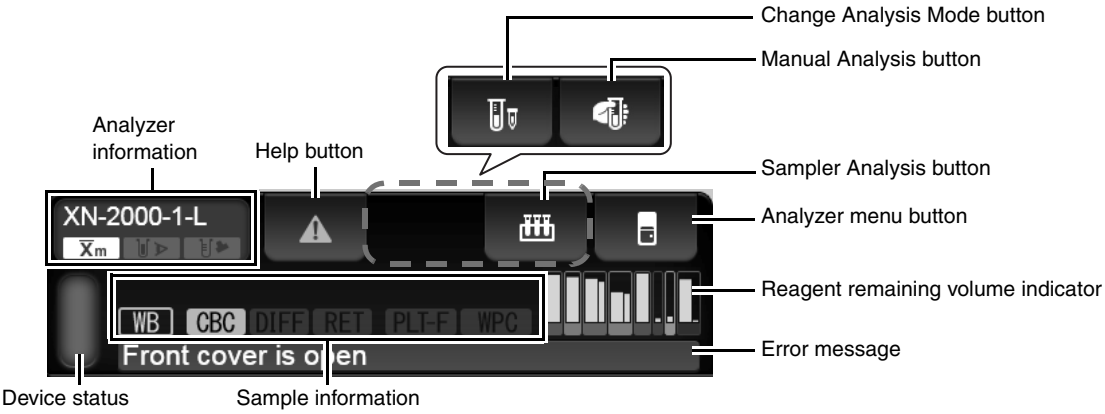
6.1.2 Control menu

The layout of the Control menu is as follows:

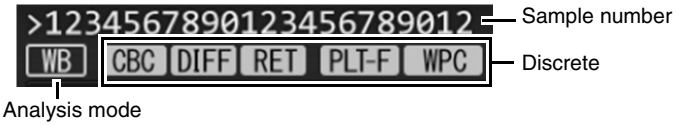
Analyzer area	Displays information about the analyzers. Up to three analyzers can be displayed, according to the number of analyzers connected to one IPU.
Sampler area	Displays information about the sampler.
RU area	Displayed when the RU-20 is connected.
Printer area	Displays information about the printer.
Host computer area	Displays information about the host computer.

● **Analyzer area**

The following items are displayed in the analyzer area:



Analyzer information	Displays the name of the analyzer and its settings. The meaning of each icon is as follows: : This is displayed when the X-barM function is ON. : This is displayed when the blood aspiration sensor is ON. : This is displayed when [Cap Open] is ON.
Help button	This is displayed when there is an error. Click to display the Help dialog box.
Change Analysis Mode button	This is displayed when performing manual analysis. Click to select an analysis mode.
Manual Analysis button	This is displayed when performing manual analysis. Click to define the settings for the sample. The displayed icon depends on the [Cap Open] setting. : This is displayed when [Cap Open] is OFF. : Blinks when [Cap Open] is ON.
Sampler Analysis button	This is displayed when performing sampler analysis. Click to define the settings for the sample. In addition, if you click during sample analysis, a dialog box for aborting the sample analysis is displayed.
Analyzer menu button	Click to run various types of maintenance functions. Clicking this button opens and closes the Analyzer menu. (➤**P.6-7** "6.1.3 List of menu items")
Reagent remaining volume indicator	Displays visually how much reagent is remaining. The colors indicate the color of each reagent's package. The reagents are, from left to right in the figure below: DCL, SULFOLYSER, WNR, WDF, DFL, RET, PLT, WPC. The thick bars indicate dilution/hemolytic agent, and thin bars indicate dye.  Click the reagent level display to open the reagent replacement dialog.

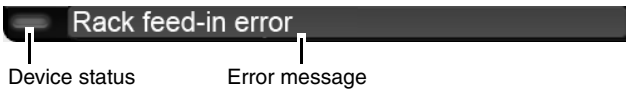
Error message	Displays the highest priority error among all current errors. The displayed error is categorized as one of the following error types: Orange background / black text: Caution Red background / white text: Warning Non-urgent information such as notices appear in normal background / white text.
Device status	Indicates the status of the analyzer. The meaning of each displayed color is the same as the Status indicator LED on the device. (➤**P.4-1** "Chapter 4: 4.1 Analyzer")
Sample information	Displays the information about the sample to be analyzed. **Sample number:** Displays the sample number. If [>] appears at the beginning of the sample number, this indicates that the next sample can be aspirated. If the sample number is not read, or if it has not been entered manually, a message is displayed to prompt the input of the number. **Analysis mode:** The selected analysis mode is displayed from the following: WB: Whole blood, LW: Low WBC, PD: Pre-Dilution, BF: Body Fluid, HPC: HPC, hsA: hsA **Discrete:** Displays the selected discrete test. This is not displayed when the analysis mode is BF/HPC. 

Note:

Clicking other places in the screen while the dialog box is displayed will minimize the dialog box, as shown below. Because the dialog box is still internally open in this state, you may not be able to perform other operations.

● Sampler area

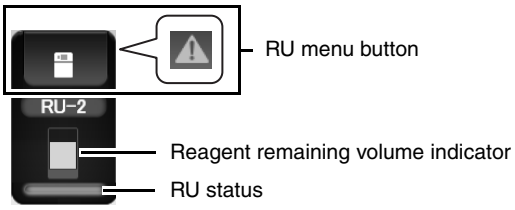
The following items are displayed in the sampler area:



Device status	Indicates the status of the sampler. The meaning of each displayed color is the same as the Status indicator LED on the device. (➤**P.4-13** "Chapter 4: 4.4.4 XN conveyor (CV-50)")
Error message	Displays the highest priority error among all current errors. The displayed error is categorized as one of the following error types: Orange background / black text: Caution Red background / white text: Warning

● RU area

The following items are displayed in the RU area:



RU menu button	Opens and closes the RU help dialog. When an error occurs on the RU-20, a help icon appears in the button part. For details on the RU help dialog, see Chapter 14. (➤**P.14-2** "Chapter 14: 14.1.2 Help dialog box")
Reagent remaining volume indicator	Displays visually how much reagent is remaining in the RU-20.
RU status	Indicates the status of the RU-20. The meaning of each displayed color is as follows: Green: Ready Flashing green: Starting up / Maintenance in progress / Reagent preparation in progress / Automatic operation (draining / RO water refilling) / Shutting down Orange: Warning Red: Error

● Printer area

The following items are displayed in the printer area:

Printer menu button

Number of print jobs

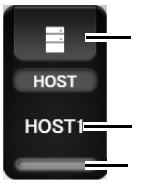
Printer status

Printer menu button	Opens and closes the printer's menu. Printing can be stopped from the printer menu.
Number of print jobs	Shows the number of jobs spooled to the printer.
Printer status	Displays the status of connection with the printer. The meaning of each displayed color is as follows: Not lit: No connection setting Green: Connected* Red: Error in progress

* Displays the printer connection status in the IPU settings. Lights green when the printer power is OFF, and also when the printer driver is not installed.

● Host computer area

The following items are displayed in the host computer area:



Host menu button

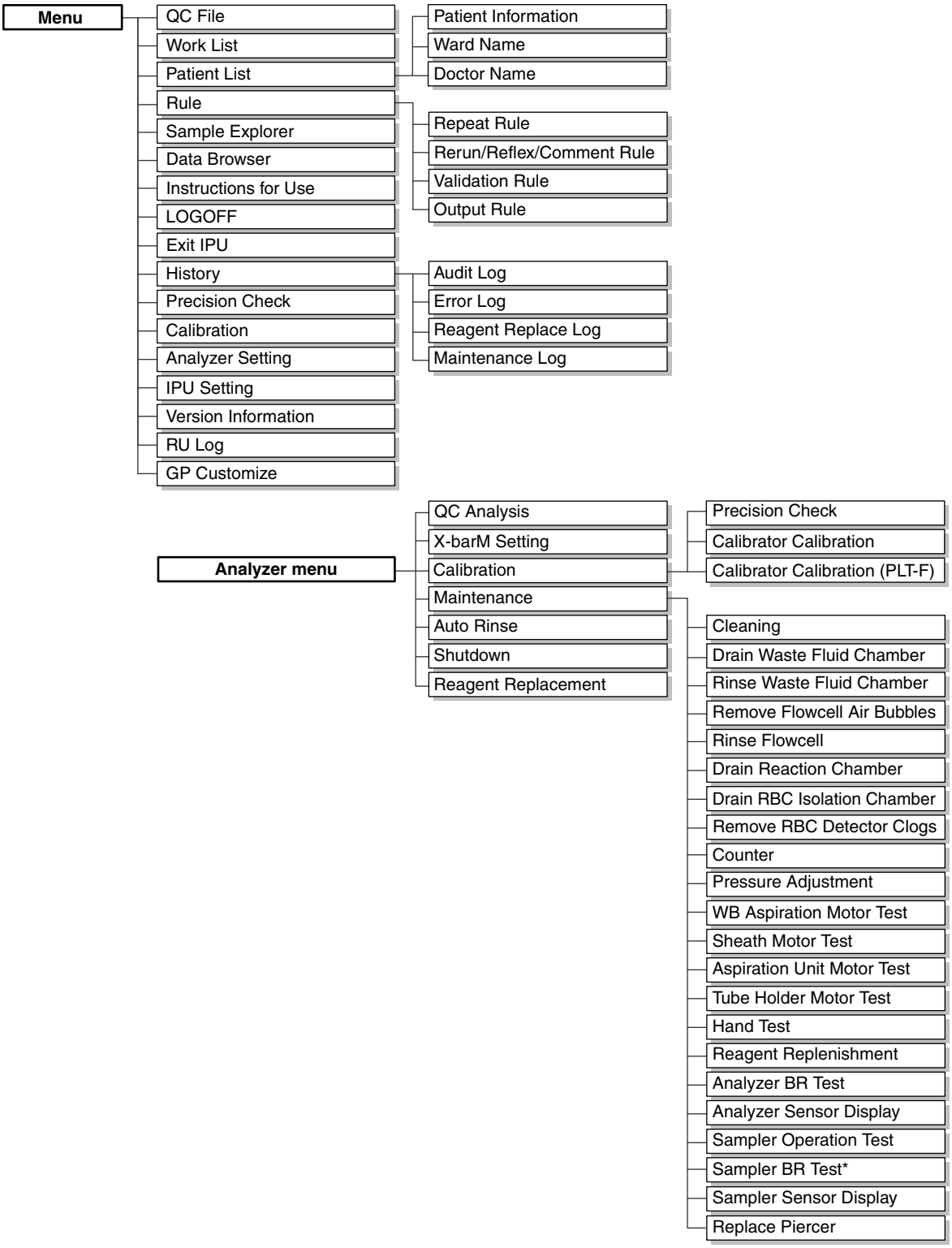
Host setting

Host status

Host menu button	Opens and closes the host computer's menu. The items displayed in this menu are synchronized with the setting in [Host Computer]. For details, see "Administrator's Guide". (➤Administrator's Guide, "Chapter 4: 4.3.4 Connection settings")
Host setting	Displays the name of the connected host computer.
Host status	Displays the status of connection with the host computer. The meaning of each displayed color is as follows: Not lit: No connection setting Green: Connected Flashing green: Communicating Red: Cannot connect

6.1.3 List of menu items

The layout of the items displayed in the basic screen of the IPU are as follows:



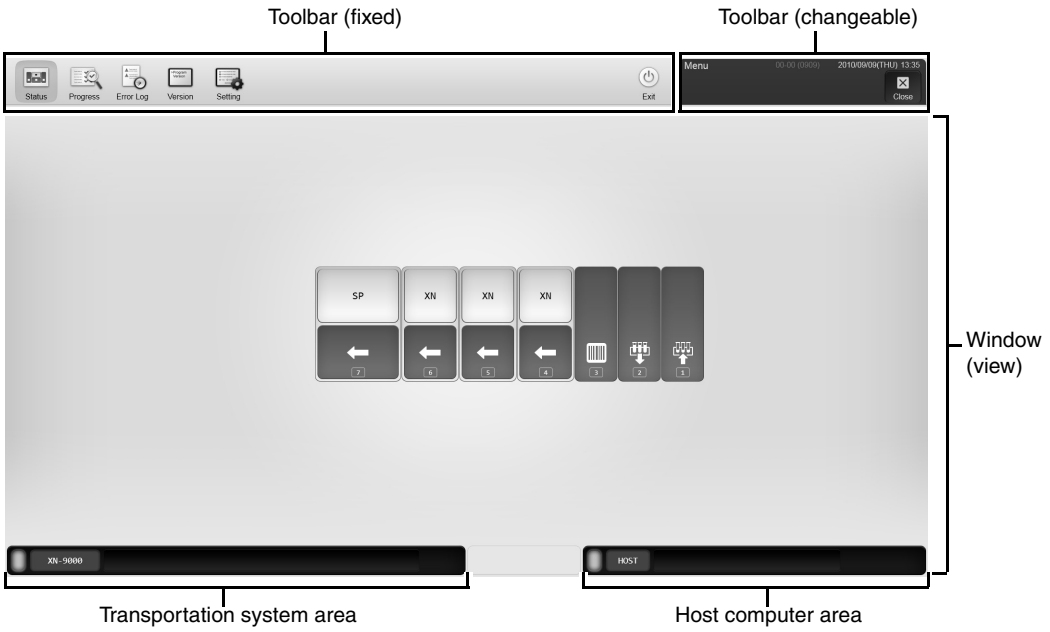
* Grayed out when the CV-50 is connected.

6.2 Operation of the transportation controller (CT-90)

The Transportation controller is a device for operating and configuring the transportation system.
The operation can be performed via the touchscreen. Directly touch the display to operate the controller.

6.2.1 Main screen layout

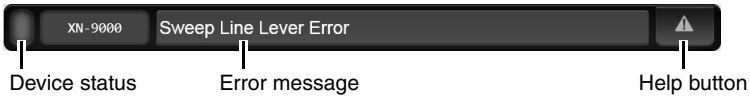
The basic screen layout of the Transportation controller is as follows:



Toolbar (fixed)	Displays buttons for executing the functions.
[Status]	Touch to check the status of the system.
[Progress]	Touch to check the progress of the analysis.
[Error Log]	Touch to check the error log.
[Version]	Touch to display the version information of the each device.
[Setting]	Touch to configure the Transportation controller.
[Exit]	Touch to shut down the entire transportation system or the transportation controller.
Toolbar (changeable)	Buttons are displayed according to the displayed function of the window. While performing each function, clicking the [Close] button displayed on the right edge closes each function screen displayed on in the window.
Window (view)	Area for performing various types of processes and operations. By default, the Status screen is displayed.
Transportation system area	Displays the information about the entire transportation system.
Host computer area	Displayed when the instrument is connected to a host computer.

● Transportation system area

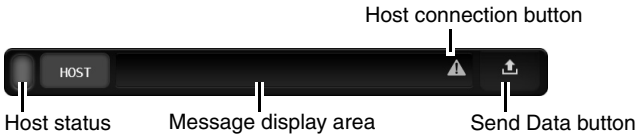
The following items are displayed in the transportation system area:



Device status	Indicates the status of the entire instrument. The meaning of each displayed color is as follows: Green: Ready Red: Error in progress
Error message	Displays the highest priority error among all current errors. The displayed error is categorized as one of the following error types: Black background / orange text: Caution Red background / white text: Warning
Help button	This is displayed when there is an error. Click to display the Help dialog box.

● Host computer area

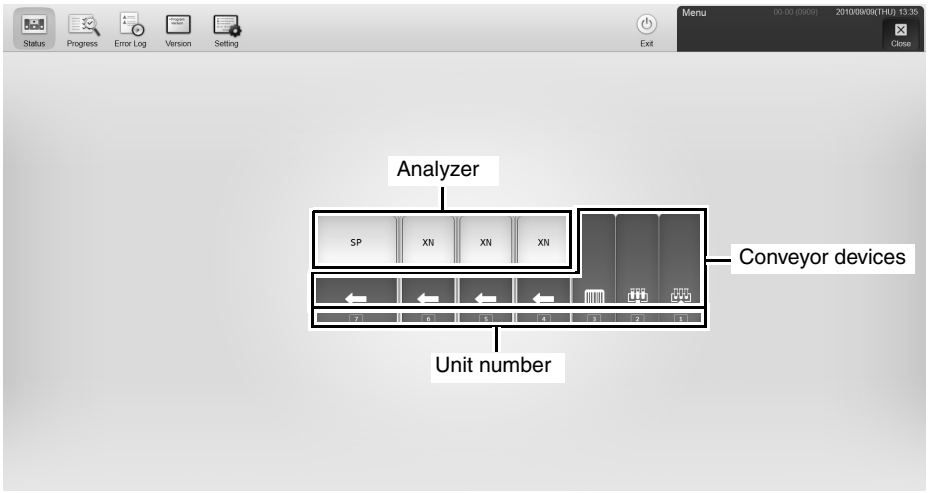
The following items are displayed in the host computer area:



Host status	Displays the status of connection with the host computer. The meaning of each displayed color is as follows: Gray: No host connection setting Green: Connected Red: Not connected
Message display area	Displays a message when there is an unsent data.
Host connection button	Click to display the dialog box. Touching [OK] in the dialog box changes the host status to Connected.
Send Data button	Click to display the dialog box. Touching [OK] in the dialog box sends the unsent data. This is enabled when there is an unsent data.

6.2.2 Check system status

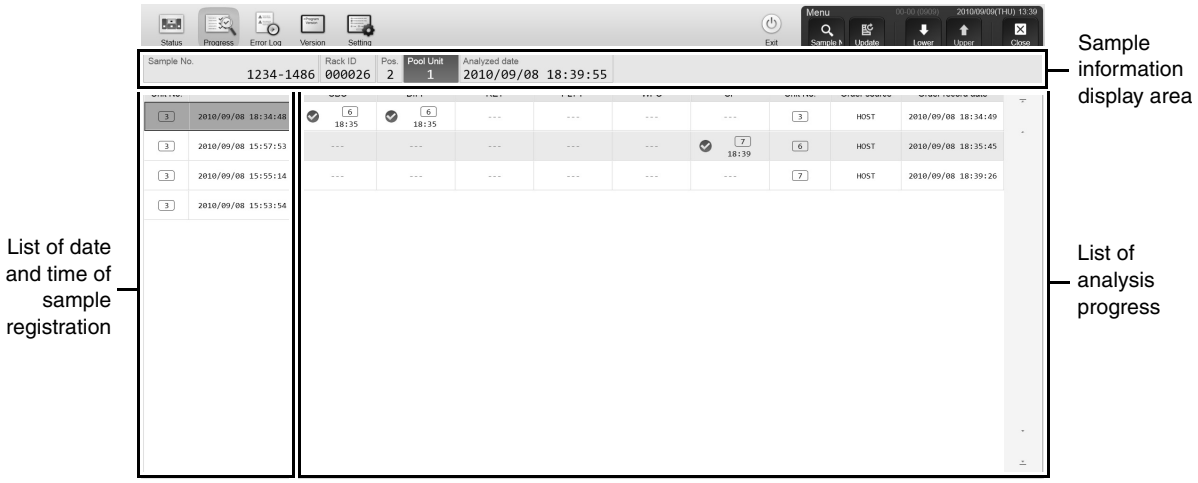
Touching the [Status] button on the toolbar displays the screen below.



Conveyor devices	Displays the status of the conveyor devices.
Categories of conveyor devices	: Feeder section : Collection section : Buffer section (Used to expand the conveyor system line.) : Barcode terminal section : Conveyor section : Turn unit section
Conveyor device status	Gray: Not connected Green: System analysis mode Orange: Off-line analysis mode Red: Error in progress
Unit number	Numbers are assigned in order starting from the right side of the instrument. These numbers are used to distinguish the devices when checking progress, etc.
Analyzer	Analyzers connected to the transportation system. The XN series are displayed as [XN], and the SP-10 is displayed as [SP]. The meaning of each displayed color is as follows: Gray: Not connected White: Normal Orange: Starting, maintenance in progress, manual analysis in progress Red: Error in progress

6.2.3 [Progress] screen

Touching the [Progress] button on the toolbar displays the screen below:



[Progress] screen

● Sample information display area

Displays information about the sample whose progress you want to check.

[Sample No.]	Displays the sample number.
[Rack ID]	Displays the rack number where the sample is set.
[Pos.]	Displays the position of the sample.
[Pool Unit]	Displays the unit number of the device that is storing the sample. In addition, depending on the result at the time of storing, the background is displayed as follows: Green: Ended normally Red: Error/Pending exists
[Analyzed date]	Displays the date on which the analysis of the sample was completed.

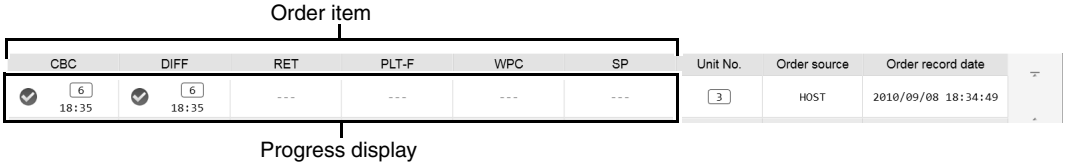
● List of date and time of sample registration

If multiple analyses were performed on the same sample, select the corresponding analysis from this list.

[Unit No.]	Displays the unit number of the unit to which the sample was registered.
Date	Displays the date and time at which the sample was registered.

● **List of analysis progress**

Displays the progress information for the selected sample.



Order item	The progress is categorized into orders for analysis parameters and instruments.
Progress display	Displays the progress information for each parameter. 6 — Device from which the result was output 18:35 — Time at which the result was output Indicates the status of the order. The meaning of each icon is as follows:
	--- No order
	Order registration
	Analysis complete
	Analysis error
	Inadequate sample
	Cancel order
	Transition order
	Unknown analysis result
	Pending
[Unit No.]	Displays the unit number of the device to which the order was registered.
[Order source]	Displays the requestor of the order. The order requestor is selected from below: This is not displayed when passing through BT-40 for the second time. HOST, XN, Manual, CT-90, SP In addition, if a retest was performed, one of the following types of retest is displayed: Repeat, Reflex, Default, Rerun
[Order record date]	Displays the date and time when the order was registered.

6.2.4 Check the progress of an analysis

You can check the progress of the sample on which a system analysis was performed. In addition, you can track the history of when and how the sample was analyzed.
Follow the steps below to check the progress of an analysis.

1 Touch the [Progress] button on the toolbar.

The [Progress] screen appears. (➤**P.6-11** "6.2.3 [Progress] screen")

2 Touch [Spl. No.].

The dialog box on the right appears.

3 Enter the sample number.

Touch the input field and enter the sample number.

4 Touch [OK].

The progress of the specified sample number appears in the list of analysis progress.

> **Note:**
> To refresh the displayed progress information, touch [Update].

Example of progress over time

1. Analysis order for [CBC] and [DIFF] recognized

CBC	DIFF	RET	PLT-F	WPC	SP	Unit No.	Order source	Order record date
		--	--	--	--	3	HOST	2010/08/19 21:29:04

2. After the analysis is complete, an analysis order for a retest of [RET] recognized

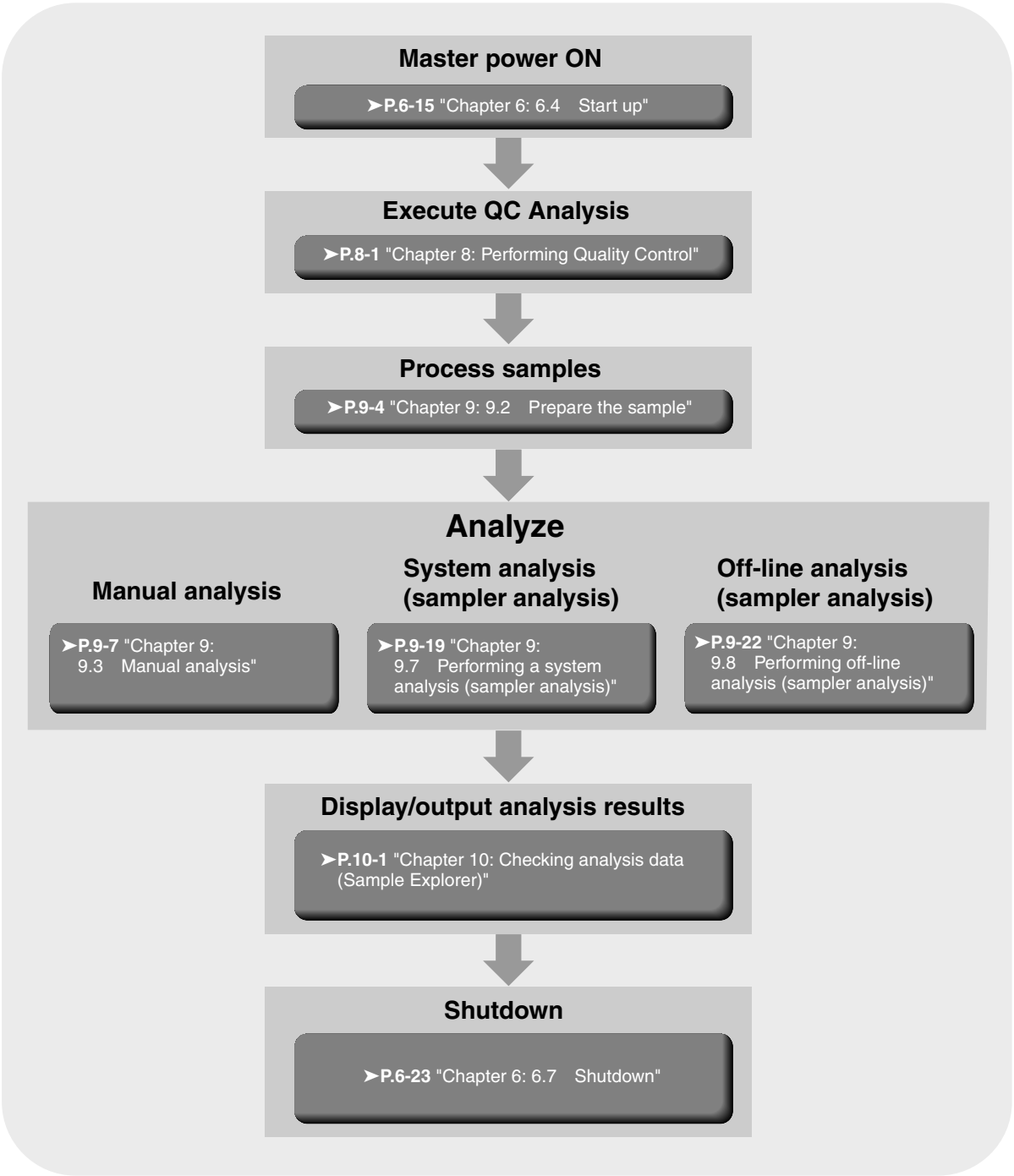
CBC	DIFF	RET	PLT-F	WPC	SP	Unit No.	Order source	Order record date
1 21:30	1 21:30	--	--	--	--	3	HOST	2010/08/19 21:29:04
--	--		--	--	--	1	HOST	2010/08/19 21:30:59

3. [RET] analysis complete

CBC	DIFF	RET	PLT-F	WPC	SP	Unit No.	Order source	Order record date
1 21:30	1 21:30	--	--	--	--	3	HOST	2010/08/19 21:29:04
--	--	4 21:35	--	--	--	1	HOST	2010/08/19 21:30:59
--	--	--	--	--	--	4	HOST	2010/08/19 21:32:17

6.3 Overall flow of operation

The flow chart below is a general representation of the operation of this instrument.
Once you understand the overall flow, see each operation explained in detail in the following sections.



6.4 Start up

6.4.1 Checks prior to turning power ON

Before turning ON the instrument's power, check the following.

Instrument inspection

- Check the connection of tubes and cables.
- Check if there are any bent tubes.
- Check if there is any object on top of the instrument.
- Check for any misplaced racks.
- Make sure that the network devices (hubs and network converters) are all powered ON.
- Discard any waste fluid in the waste container (if applicable).
  For the details on discarding waste fluid, see Chapter 13. (➤**P.13-5** "Chapter 13: 13.3.1 Replace the waste container")

Reagent inspection

Make sure there are extra supplies of reagents for the number of samples to be processed on the day of analysis. The amount of reagent needed varies with analysis mode. Therefore, check if enough reagent is available for the daily routine analyses.
If a reagent runs out during the analysis, the instrument automatically stops. Replace the reagent at this time. The analysis cannot resume until the replacement is complete.

Volume of reagent per box

For reagent volumes, refer to Chapter 5.
(➤**P.5-17** "Chapter 5: 5.18 Table of reagent specifications")

Volume of reagent used per analyzed sample (in continuous analysis)

* The following are examples. For more information, please contact your local dealer or Sysmex Representative.

Reagent	Discrete mode	
	CBC	CBC+WDF+WPC+RET+PLT-F
Total reagent volume	Approx. 29.9 mL	Approx. 62.8 mL
CELLPACK DCL	Approx. 27.9 mL	Approx. 53.7 mL
SULFOLYSER	Approx. 0.5 mL	Approx. 0.5 mL
Lysercell WNR	Approx. 1.5 mL	Approx. 2.5 mL
Fluorocell WNR	Approx. 20 µL	Approx. 20 µL
Lysercell WDF	-	Approx. 1.5 mL
Fluorocell WDF	-	Approx. 20 µL
Lysercell WPC	-	Approx. 1.5 mL
Fluorocell WPC	-	Approx. 20 µL
CELLPACK DFL	-	Approx. 3.0 mL
Fluorocell RET	-	Approx. 20 µL
Fluorocell PLT	-	Approx. 20 µL

Volume of reagent used on instrument startup

Total reagent volume	Approx. 313.8 mL
CELLPACK DCL	Approx. 286.5 mL
SULFOLYSER	Approx. 1.5 mL
Lysercell WNR	Approx. 7.5 mL
Fluorocell WNR	Approx. 60 µL
Lysercell WDF	Approx. 4.5 mL
Fluorocell WDF	Approx. 60 µL
Lysercell WPC	Approx. 4.5 mL
Fluorocell WPC	Approx. 60 µL
CELLPACK DFL	Approx. 9 mL
Fluorocell RET	Approx. 60 µL
Fluorocell PLT	Approx. 60 µL

* Analysis conditions:
At least 1 hour and no more than 24 hours after shutdown/cleaning.

Volume of reagent used on shutdown process

Total reagent volume	Approx. 75.9 mL
CELLPACK DCL	Approx. 71.9 mL
CELLCLEAN AUTO	Approx. 4 mL (1 vial)

Volume of reagent used for rinsing

Total reagent volume	Approx. 272.6 mL
CELLPACK DCL	Approx. 236.2 mL
SULFOLYSER	Approx. 2 mL
Lysercell WNR	Approx. 10 mL
Fluorocell WNR	Approx. 80 µL
Lysercell WDF	Approx. 6 mL
Fluorocell WDF	Approx. 80 µL
Lysercell WPC	Approx. 6 mL
Fluorocell WPC	Approx. 80 µL
CELLPACK DFL	Approx. 12 mL
Fluorocell RET	Approx. 80 µL
Fluorocell PLT	Approx. 80 µL

6.4.2 Turning ON the power for the entire system

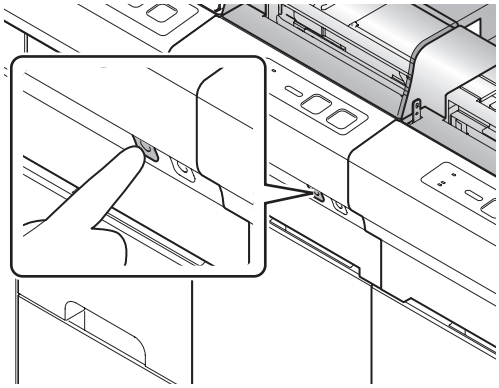
Follow the steps below to turn ON the power for the entire instrument.

1 Verify that power switches on the individual conveyors, instruments and devices on the XN-9000 system are in the "ON" position.

Leaving power switches to the sampler and the analyzer in "ON" position will allow master startup switch on BT device to control power to these devices.
(➤**P.4-1** "Chapter 4: Part Names and Functions")

2 Press master startup switch at BT to turn on entire system and connected instruments and devices.

Press the switch (green) as shown in the adjacent diagram..
The power for the entire instrument turns ON.
Check the status of the device in the [Status] screen of the transportation controller.



Information

If a transportation unit remains gray in the [Status] screen after startup, check the status LED of that device.

- If the LED is OFF, make sure the main power is ON and press the startup switch of the device.
- If the LED is ON, turn the main power OFF and then ON, and press the startup switch of the device. At this time, an error may occasionally occur in another device. Stop the alarm, wait until the device that is starting up has completed startup, and reset.

6.4.3 Turning ON the power for a specific analyzer (XN-10/XN-20)

When you want to perform manual analysis only, for example, you can start just the analyzer (XN-10/XN-20). Follow the steps below to turn ON the power for the analyzer.

1 Verify that the main power switch of XN conveyor (CV-50) is ON.

(➤**P.4-13** "Chapter 4: 4.4.4 XN conveyor (CV-50)")

2 Turn ON the IPU.

The power to the instrument turns ON, and the analyzer runs a self-check. Wait until the self-check is completed. (➤**P.6-20** "6.4.5 Execution of analyzer self-check")

If the IPU Logon setting is set to ON, the Logon dialog box appears.
(➤**P.6-19** "6.4.4 Log on to the IPU")

Information

Do not restart only the IPU (by restarting Windows) or log off (log off from Windows) while the main power switch of the connected equipment is ON. After Windows restarts or you log off, the equipment may not be able to reconnect with the IPU.
If you need to restart or off from Windows, also switch off the main power switch of the equipment. Make sure that the IPU has finished restarting before switching the main power switch back on.

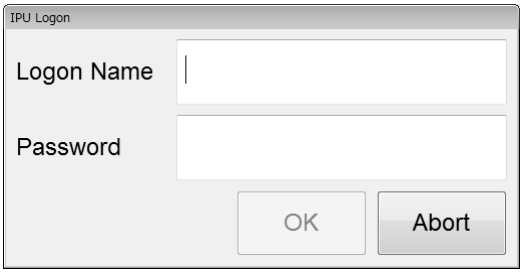
Note:

- If an error occurs (e.g. if a reagent runs out) during startup, the operator must log on to the IPU to resolve the error.
- If you want to perform a off-line analysis (sampler analysis), turn ON the startup switch on each conveyor.

6.4.4 Log on to the IPU

When turning ON the instrument's power, the following logon dialog box appears in the IPU*. Enter the required information, then click [OK] to log on to the instrument. If you click [Abort], logon is not performed, and the IPU program exits.

* If Auto Logon is enabled in the IPU, the Logon dialog does not appear.



Contact your administrator for your logon name and password.

Information

Immediately after logging on, the administrator should reset the default logon name and password.
Also, add users and set their permissions for this instrument. For details, see "Administrator's Guide". (➤Administrator's Guide, "Chapter 4: 4.3.2 System settings")

6.4.5 Execution of analyzer self-check

Once the power on the instrument turns ON, a self-test automatically runs for approximately 10 minutes, to determine if there is any error in the analyzer. The self-check consists of the following tasks.

● **Initialization of the mechanical parts**

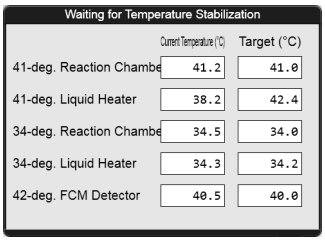
The mechanical parts move to their initial positions, and initialize/check the hydraulic parts.

● **Rinse**

Rinses the analyzer one to three times, depending on how long it has been since the last rinse.

● **Waiting for temperature stabilization***

The dialog box on the right appears, and the system waits until the temperatures are stable.
Once the temperatures are stable, the dialog box closes automatically.



Current Temperature (°C)	Displays the current temperatures of each device.
Target (°C)	Displays the target temperatures.

* Depending on the analyzer type, the following items do not appear in the dialog box.
34-deg. Reaction Chamber, 34-deg. Liquid Heater

● **Background check**

Performs analysis without aspirating the samples to verify the effects of the auto rinse. This is repeated up to 3 times.
The analysis results can be checked in the Sample Explorer screen. Any item whose result is not within the acceptable range is marked with a [!].

Parameters analyzed in background check and their acceptable values

Checked Parameter	Acceptable Value	Explanation
WBC-N	0.10 x 10^3/µL or less	WBC counted in the WNR channel
WBC-D	0.10 x 10^3/µL or less	WBC counted in the WDF channel
WBC-P*1	0.10 x 10^3/µL or less	WBC counted in the WPC channel
RBC	0.02 x 10^6/µL or less	-
HGB	0.1 g/dL or less*2	-
PLT-I	10 x 10^3/µL or less	PLT counted in the RBC/PLT channel (PLT particle size distribution)
PLT-O*1	10 x 10^3/µL or less	PLT counted in the RET channel
PLT-F*1	3 x 10^3/µL or less	PLT counted in the PLT-F channel

*1 These items do not appear with all analyzer types.
*2 In the case of Netherlands SI units, 0.1 mmol/L.

If the results are still not within the acceptable range after 3 analyses, it will be considered a background check error. Click [Execute] in the Help dialog box to execute Auto Rinse and Background Check again.
If the results are still not within the acceptable range, see Chapter 14. (➤**P.14-6** "Chapter 14: 14.2 Error message list")

Caution!
When the results are not within the acceptable range, you can still finish the check by clicking [Close] on the Help dialog box. However, please note that the analysis results may be unreliable. Clicking [Close] does not clear the error.

Note:
The sample number for the background check data is [BACKGROUNDCHECK].

6.5 Log off from the IPU

To switch between users, follow the steps below to log off.

1 Click the [LOGOFF] icon in the Menu screen.

The dialog box on the right appears.

2 Click [Yes].

The user is logged off from the IPU.
After the logoff, the Logon dialog box appears. (➤**P.6-19** "6.4.4 Log on to the IPU")

Note:
You cannot log off while the analyzer or the conveyor is running.

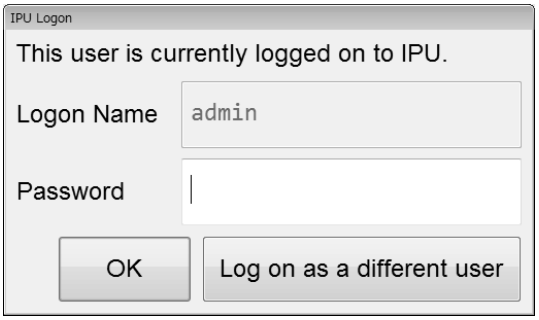
6.6 Operation lock function (IPU Screen Lock)

When an operator needs to step away from the instrument, the IPU can be locked.
The operation lock is turned ON in the following cases. However, if a dialog or control menu appears, the operation lock function will not operate.

- When the instrument has not been operated for a set length of time*
- When the operator turns ON the operation lock function directly by pressing Ctrl + L.

* You can set this between 15 to 60 minutes. For the details on the instrument's settings, see "Administrator's Guide". (➤Administrator's Guide, "Chapter 4: 4.3.2 System Settings")

The following dialog box appears while the operation lock is enabled.



[Logon Name]	Displays the user name currently logged on.
[Password]	Enter the password here to unlock.
[OK]	Click this button after entering the password to unlock the operation lock.
[Log on as a different user]	Log off the current user, and then click when logging on as a different user.

Information

IPU Screen Lock will not interrupt system analysis (sampler analysis).

6.7 Shutdown

This section describes the procedure for shutting down the instrument. Be sure to perform shutdown after finishing analysis for the day.

6.7.1 Automatically shutting down the entire system

The power of the entire system can be turned off automatically by placing a rack with CELLCLEAN AUTO. Use the special racks for shutdown. The racks for shutdown have a green label for identification. In the procedure below, a rack with a barcode label beginning with "SRSA" is used as an example. For details, see "Administrator's Guide". (➤Administrator's Guide, "Chapter 5: 5.3.1 Acceptable barcodes")

Note:

When shutdown is performed using this method, "Shutdown1" is executed on the SP-10. If you wish to execute "Shutdown2", see below.
(➤**P.6-27** "6.7.3 Shutting down the SP-10 manually")

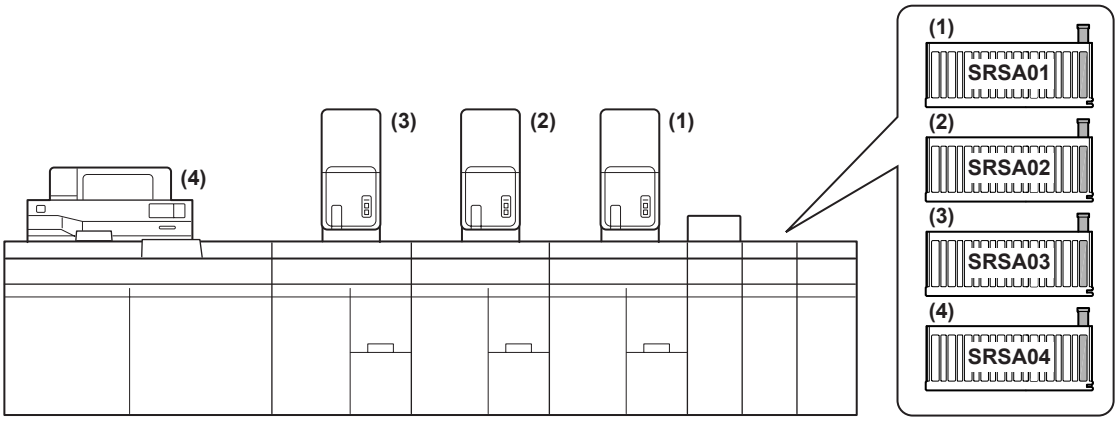
Follow the steps below to shut down the entire system.

1 Make sure each instrument is in the READY state.

If the status LED is not lit green, wait until it does.
If an error has occurred on one of the instruments or an instrument is performing standalone analysis, that instrument will not be shut down.
It takes about 20 minutes for the SP-10 to enter the READY state after the final analysis.

2 Place CELLCLEAN AUTO in the rack.

Place CELLCLEAN AUTO in the racks with numbers corresponding to each analyzer as shown below (recommended). This procedure uses the basic configuration (4 analyzers) as an example. Prepare a number of racks equal to the number of analyzers you are using.



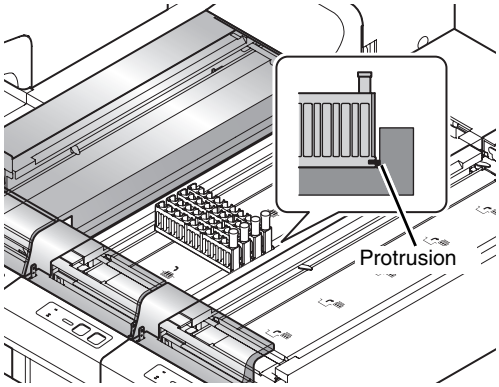
Note:

- You can shut down a particular analyzer by placing only the rack for that analyzer. Shutdown of only that analyzer and the entire transportation system will take place. Shutdown of analyzers for which racks are not placed will not be performed.
- Shutdown can also be performed by placing a number of CELLCLEAN AUTO vials equal to the number of instruments in the rack with the barcode label "SRSA00". In this case, the placement positions in the rack correspond to the instruments as follows:
  - 7th: 4th connected analyzer
  - 8th: 3rd connected analyzer
  - 9th: 2nd connected analyzer
  - 10th: 1st connected analyzer

  For details, see "Administrator's Guide". (➤Administrator's Guide, "Chapter 5: 5.3.1 Acceptable barcodes")

3 Place the rack in the feeder.

Slide the groove on the rack into the protrusion on the right side (when you face the analyzer). Conveying automatically starts when the rack is placed.



4 Shutdown is performed automatically.

CELLCLEAN AUTO is aspirated in each analyzer and rinsing begins sequentially.

- After the racks are sent to the collection section, the power of the transportation system turns OFF.
- When shutdown is finished, the power of each instrument turns OFF.

Caution!

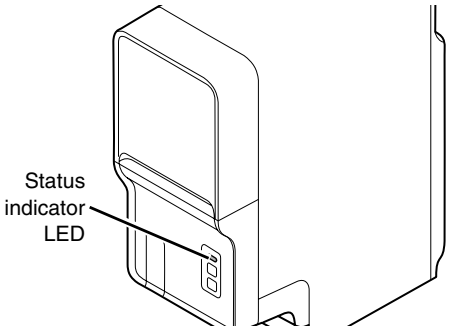
- Use 1 vial of CELLCLEAN AUTO for each analyzer. CELLCLEAN AUTO that has already been used cannot be reused.
- During the transition to shutdown, sample tubes other than CELLCLEAN AUTO are not accepted.
- Do not mix regular sample tubes together with CELLCLEAN AUTO.
- If a sample other than CELLCLEAN AUTO is placed in a shutdown rack, the sample will not be analyzed.
- A rack other than a special shutdown rack will not be accepted.

6.7.2 Shutting down the analyzer manually

If needed, you can shut down only the analyzer.
Follow the steps below to shut down the analyzer.

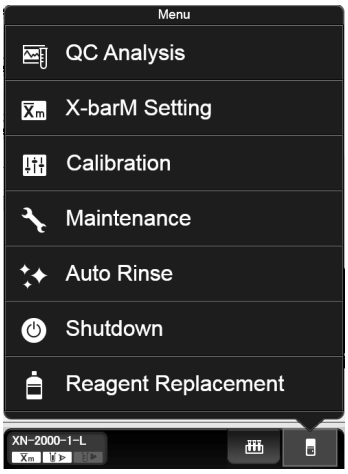
1 Check the Status indicator LED on the analyzer.

If the Status indicator LED is not lit green, wait until it does.



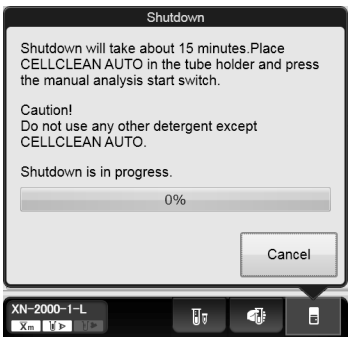
2 Click the Analyzer menu button on the control menu.

The menu on the right appears.



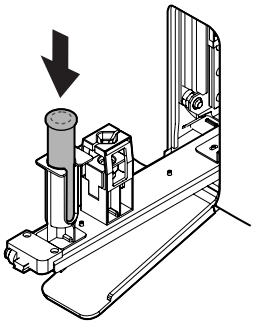
3 Click [Shutdown].

The window on the right appears.
If retracted, the tube holder slides out forward.



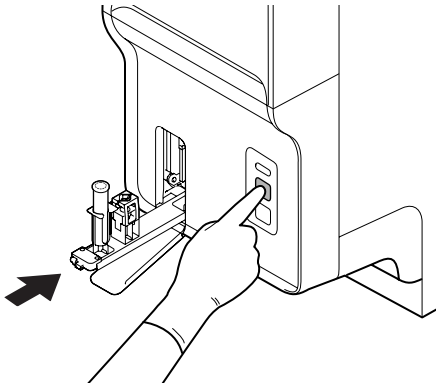
4 Place CELLCLEAN AUTO in the tube holder.

Place it in the front holder, when you face the analyzer.



5 Press the start switch on the analyzer.

The tube holder retracts into the analyzer and aspiration begins. When aspiration finishes, the tube holder automatically eject out.



Note:

- When [IPU Shutdown] is set to ON, the IPU shuts down automatically after all analyzers connected to the IPU have shut down.
  (➤Administrator's Guide, "Chapter 4: 4.3.2 System Settings")
- About 15 minutes is required for shutdown. Progress is shown in a progress bar on the screen. When shutdown finishes, the tube holder automatically retracts into the analyzer.
- If the CELLCLEAN AUTO is not removed before shutdown finishes, a notice indicating that a sample tube remains in the tube holder will appear at the next startup.

6.7.3 Shutting down the SP-10 manually

If needed, you can shut down only the SP-10.
Follow the steps below to shut down the SP-10 analyzer.

1 Perform the preparations for shutting down the SP-10.

For details, see the Instructions for Use for SP-10.
(➤SP-10 Instructions for Use, "Chapter 9: 9.1.1 Performing [Shutdown1]" , "Chapter 9: 9.2.2 Performing [Shutdown2]")

2 Touch [Conv.int.] in SP-10's main menu screen.

Note:
If the power to the transportation system is OFF, the step for interrupting the transport is not necessary. Carry out the operations in steps 5 through 8.

3 Touch [Interrupt].

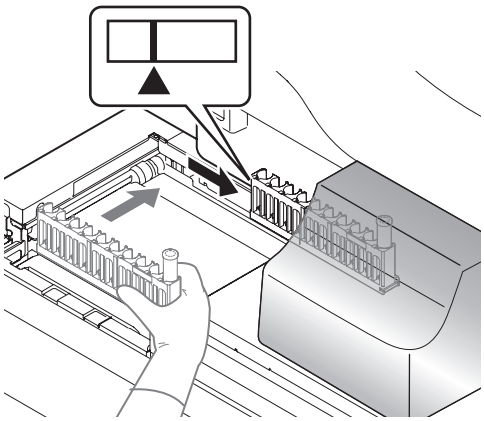
4 Touch [Return].

5 Touch [Shutdown] in main menu screen.

The Shutdown screen appears.

6 Set CELLCLEAN AUTO on the SP conveyor (CV-60).

1 Place CELLCLEAN AUTO in the 10th position of the rack.
2 Set the rack so that its left end fits the label shown on the right.

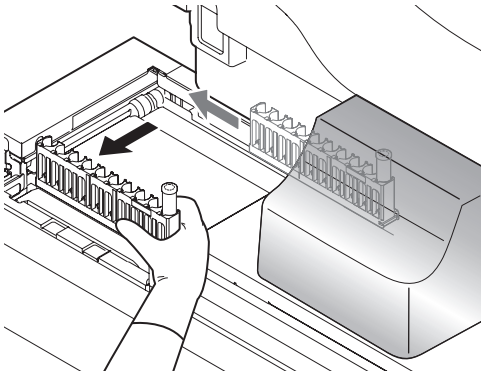


7 Touch [Shutdown1(Daily)] or [Shutdown2(Weekly)] in SP-10's Shutdown screen.

The progress will be displayed in a progress bar on the screen. Wait until the preparation of the smear sample finishes and the sample tube is returned to the rack.

8 Remove the rack.

Slide the rack to left on analysis line, and then remove it.



6.7.4 Turning OFF the transportation system manually

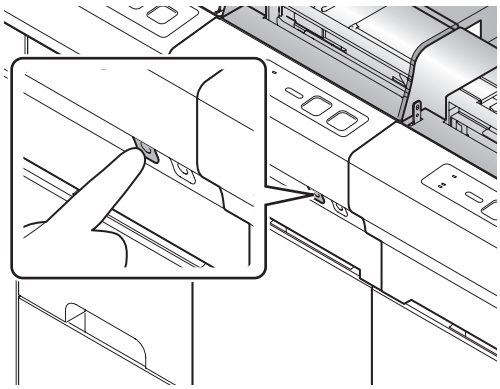
If needed, you can turn OFF only the power of the transportation units.
Follow the steps below to shut down the transportation system.

1 Make sure that all transportation units are in the READY state.

If the status LED is not lit green, wait until it does.

2 Hold down the master startup switch on the barcode terminal (BT-40) for at least 2 seconds.

Press the switch (green) as shown in the adjacent diagram.



Or, execute the procedure below.

1 Touch the [Exit] button on the toolbar in Transportation controller.
2 Touch [Turn off the power of the conveyor unit and CT-90.]
3 Touch [OK].

3 The entire transportation system's power is turned OFF.

6.7.5 Shutting down the IPU manually

If needed, you can shut down the IPU.
Follow the procedure below to turn off the power of the IPU.

1 Click [Exit IPU] in the menu screen.

A dialog box appears.

2 Click [Yes].

The IPU shuts down.

3 Shutdown Windows.

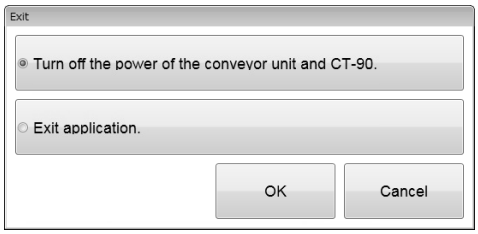
Your computer shuts down.

6.7.6 Shutting down the transportation controller manually

If needed, you can shut down only the transportation controller.
Follow the procedure below to turn off the power of the transportation controller.

1 Touch the [Exit] button on the toolbar.

The dialog box on the right appears.



2 Touch [Exit application].

3 Touch [OK].

The transportation controller shuts down.

4 Shutdown Windows.

Your computer shuts down.

6.8 Restart the analyzer

If [IPU Shutdown] is set to OFF, you can restart the analyzer by following the steps below.
If [IPU Shutdown] is set to ON, the IPU shuts down automatically after all analyzers connected to the IPU have shut down. Therefore, the analyzers cannot be restarted.
(➤Administrator's Guide, "Chapter 4: 4.3.2 System settings")

1 Shutdown all analyzers connected to the IPU.

The restart all button appears in the control menu.

2 Click [Restart Analyzer] in the control menu.

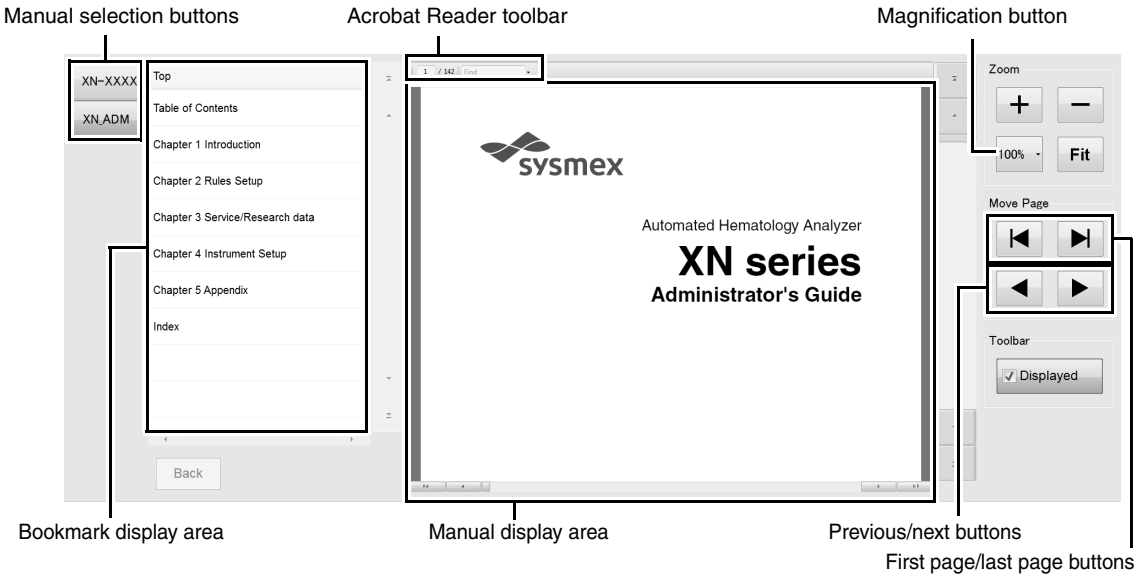
The power to the analyzer turns ON, and the analyzer runs a self-check. Wait until the self-check is complete.
(➤**P.6-20** "6.4.5 Execution of analyzer self-check")

Note:

To restart the entire instrument, see below.
(➤**P.6-17** "6.4.3 Turning ON the power for a specific analyzer (XN-10/XN-20)")

6.9 On-line manuals

For rapid access, the manual will be accessible through the IPU.
The following screen appears when [Instructions for Use] is clicked in the menu screen.



Manual selection buttons	Click to change manuals. The manuals that appear vary depending on the configuration of your instrument.
Acrobat Reader toolbar	Acrobat Reader toolbar area. Enter a page number in the box on the left to display that page. Enter a text string in the box on the right to search the manual for that text.
Manual display area	Displays the manual.
Bookmark display area	Table of contents of the manual. Click a chapter title to display the topics in that chapter. Click a topic to display that topic in the screen.
[Back]	Click to return the bookmark area to the list of chapter titles.
[Zoom]	Changes the zoom
[+]	Click to enlarge the view of the manual.
[-]	Click to reduce the view of the manual.
Magnification button	Select any magnification to change the view of the manual to that magnification.
[Fit]	Click to fit the view of the manual to the manual display area.

[Move Page]		Use to move through the pages.
	First page/last page buttons	Click to move to the first page or the last page of the displayed manual.
	Previous/next buttons	Click to move back to the previous page or forward to the next page.
[Toolbar]		You can select whether the Acrobat Reader toolbar is displayed.

Chapter 7 Preparing for analysis (registering information)

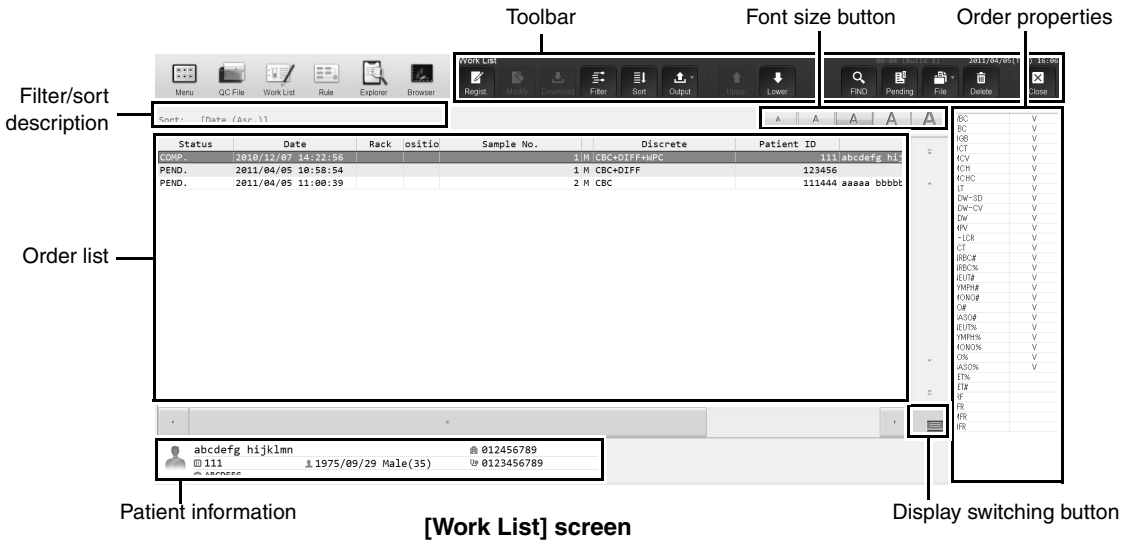
This chapter explains how to manually register the analysis order and the patient information before performing an analysis.
This is not an operation to be performed routinely on this instrument. Normally, analysis orders and patient information are sent and received between the host computer and the transportation controller.

7.1 Work List functions

The Work List functions allow you to display, register, modify and delete analysis orders. You can register analysis information for up to 2,000 orders. You can sort, filter, search, save and restore analysis order.

7.1.1 Work List screen

Clicking the [Work List] icon in the Menu screen displays the screen shown below.Alternatively, you can also click the [Work List] button on the toolbar.
A maximum of 2,000 analysis orders can be stored.



[Work List] screen

● **Toolbar**

The button of the following functions are displayed.

[Regist.]	Click to display the [Regist Order] dialog box.
[Modify]	Click to display the [Modify Order] dialog box for the selected analysis order.
[Download]	Click to download analysis orders from the host computer.
[Filter]	Click to display a dialog box that allows you to set conditions for the data displayed in the order list.
[Sort]	Click to display a dialog box that allows you to set the sorting order for the data displayed in the order list.
[Output]	Click to output the data of the selected analysis order.
[Upper]	Click to move the selection up by one row.

[Lower]	Click to move the selection down by one row.
[FIND]	Click to display a dialog box that allows you to search data.
[Pending]	Click to switch the display between pending orders only and all analysis orders.
[File]	Click to display a submenu. This can be used to save and restore data.
[Delete]	Click to display a dialog box that allows you to delete the selected analysis order.

● Order list

The main screen of the Work List screen.

[Status]	Displays the status of the order.
[PEND.]	Indicates that the order has been registered.
[COMP.]	Indicates that the analysis has completed.
[ERR.]	Indicates that an error has occurred.
[Date]	Displays the date and time at which the order was registered.
[Rack]	Displays the rack number.
[Position]	Displays the sample tube position number when the sampler analysis was performed.
[Sample No.]	Displays the sample number. The column to the right of the [Sample No.] column indicates how the sample number was obtained. [B] : Hand-held barcode reader input [M] : Manually entered [C] : Host computer queried If you modify a sample number, an [M] is displayed.
[Discrete]	Displays the discrete tests for the analysis parameters you specified in the [Work List] screen or the host computer.
[Patient ID]	Displays the patient ID.
[Patient Name]	Displays the name of the patient (first name, last name).
[Sample Comment]	Displays the status of the sample entered by the user and other information.

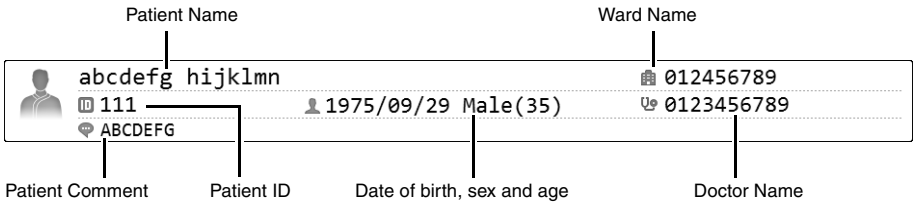
● Order properties

Displays the details of the analysis order selected in the order list.
It appears on the sub screen.

[ITEM]	All analysis items are displayed.
[Order]	The analysis parameters for the order selected in the list pane are marked with a check mark ([V]).

● Patient information

Displays the patient information of the analysis order selected in the order list.
It appears on the sub screen.



Patient Name	Displays the name of the patient (first name, last name).
Patient ID	Displays the patient ID.
Date of birth, sex and age	Displays the date of birth, gender, and age of the patient.
Ward Name	Displays the patient's ward name or the name of the clinical service.
Doctor Name	Displays the name of the doctor assigned to the patient.
Patient Comment	Displays comments about the patient.

Note:

- For the details on registering each items, see below.
  - Patient Name, Patient ID, Date of birth, sex and age:
    (➤**P.7-19** "7.2.2 Registering and modifying patient information")
  - Ward Name:
    (➤**P.7-26** "7.2.7 Registering and modifying ward names")
  - Doctor Name:
    (➤**P.7-28** "7.2.9 Registering and modifying doctor names")
- Items that have not been filled will not be displayed.

● Filter/sort description

Shows what conditions were used to display the analysis orders. These are the conditions you specified in the filter and sort settings.
For the details on the settings, see below.
(➤**P.7-9** "7.1.3 Sorting analysis orders")
(➤**P.7-10** "7.1.4 Specifying data display conditions (filter)")

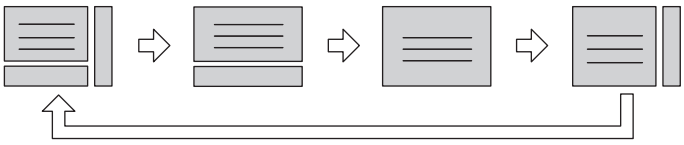
The following symbols are used.

Symbol	Analysis Method
[ ] Brackets	The condition inside [ ] is considered one grouping. If there is a defined name, it is shown in front of the brackets. e.g. A filter called "Weekly Retests" that restricts by [Date]: Weekly Retests[Date[2010/05/05~2010/06/06]]
, Comma	The conditions before and after the comma are combined with a logical AND. e.g. Orders restricted by [Date] AND [Order Type]: [Date[2010/05/05~2010/06/06],Order Type[Rerun]]

Symbol		Analysis Method
|	Pipe	The conditions before and after the pipe are combined with a logical OR. e.g. All orders whose [Order Type] is either [Rerun] OR [Reflex]: [Order Type[Rerun|Reflex]]
:	Colon	Used between a setting and its value. e.g. All orders whose [Print Graphic] setting under [Output Results] is [Outputted]: [Output Results[Print Graphic:Outputted]]
( )	Parentheses	Indicates [Asc.] or [Desc.]. e.g. All orders sorted by [Analysis Date] in ascending order: [Analysis Date(Asc.)]
>	Greater-than symbol	Indicates priorities between sort conditions. e.g. [Date] has higher priority than [Time]: [Date(Desc.)]>[Time(Asc.)]

● **Display switching button**

You can click the display switching button to open/close the sub screens. Click to switch through the 4 patterns in the order "sub-screen (right and bottom)" → "sub-screen (bottom)" → "no sub-screen" → "sub-screen (right)".



● **Font size button**

To change the size of the characters and the line height in the sample list, click the character size button.
When you change the size setting of the characters, see "Administrator's Guide".
(➤Administrator's Guide,"Chapter 4: 4.3.3 Display settings")

Note:

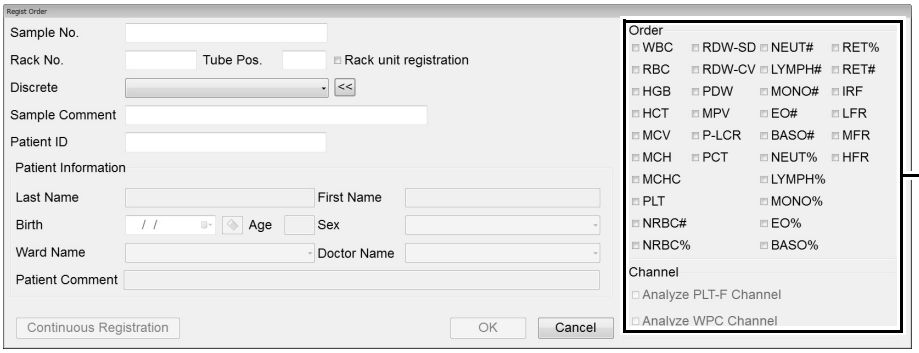
Multiple data can be selected as follows:
- Drag multiple consecutive rows while holding down the left button on the mouse or.
- While pressing Ctrl, click on the row that you want to select.

7.1.2 Registering and modifying analysis orders

This section explains how to register and modify an analysis order from the [Work List] screen.

Registering an analysis order

Click the [Regist.] button on the toolbar to display the dialog box below.



[Regist Order] dialog

Modifying an analysis order

When you double-click on the table of orders in the [Regist Order] dialog, the [Modify Order] dialog appears. Alternatively, you can also select the order you want to modify, and then click the [Modify] button on the toolbar.

The fields in the [Modify Order] dialog box are the same as those of the above*. Please refer to it.

* [Rack unit registration] does not appear.

Note:

- If 2,000 analysis orders have been registered, the [Regist.] button on the toolbar is grayed out and cannot be clicked. Delete old orders and then register a new analysis order.
- Analysis orders for which analysis has been completed cannot be modified.
- When registering an analysis order, if an order with the same entries for the items below has already been registered, a dialog box will appear to confirm overwriting of the previous order.
  - [Sample No.]

Follow the steps below to register or modify an analysis order.

1 Populate the displayed fields.

[Sample No.]	For new registrations, a sample number is automatically generated. Alternatively, you can also assign an arbitrary sample number. You can enter up to 22 characters.
[Discrete]	Select the discrete test. For the parameters included in each discrete test, see below. (➤**P.7-8** "Table of discrete tests and their corresponding analysis parameters") A selection button is displayed on the right side of [Discrete]. Clicking the button displays the order selection area on the right side of the dialog box.
[Sample Comment]	Enter comments about the sample. You can enter up to 40 characters.
[Patient ID]	Enter the patient ID. You can enter up to 16 characters. When you enter a [Patient ID], a corresponding [Patient Information] is automatically searched. If there is a match, the information is displayed. This is displayed only if the user who is logged in has the privileges to display and modify patient info. For details on privileges to display and modify patient info, see the "Administrator's Guide". (➤Administrator's Guide,"Chapter 4: 4.3.2 System settings")

* For the analysis ordering setting, see the "Administrator's Guide". (➤Administrator's Guide, "Chapter 4: 4.3.5 Auto Processing Settings")

● [Patient Information]

The analysis order can be registered without entering any patient information.

* This is displayed only if the user who is logged in has the privileges to display and modify patient info. For details on privileges to display and modify patient info, see the "Administrator's Guide". (➤Administrator's Guide,"Chapter 4: 4.3.2 System settings")

[Last Name]	Enter the last name of the patient. You can enter up to 20 characters.
[First Name]	Enter the first name of the patient. You can enter up to 20 characters.
[Birth]	Enter the patient's date of birth. Enter it in the format "Year (4 digits)/Month (2 digits)/Date (2 digits)". If you click the button on the right edge of the input field, a calendar appears. You can also enter the date by selecting from this calendar. A delete button is displayed on the right side of [Birth] field. Clicking it will clear the patient's date of birth.
[Age]	Enter the patient's age. This is automatically displayed when [Birth] is entered.
[Sex]	Select the patient's gender.
[Ward Name]	Select the name of the patient's ward.
[Doctor Name]	Select the name of the doctor assigned to the patient.

[Patient Comment]	Enter any comment about the patient. You can enter up to 100 characters.

Information

If a patient ID has not been entered, patient information cannot be entered.

Order selection area

● **[Order]**

Select the check boxes to specify the parameters to analyze. The displayed analysis parameters vary depending on the configuration of the connected analyzer.
If you have selected a [Discrete], the check boxes for the corresponding parameters are selected.
If the selected parameter combination does not exist under [Discrete], [FREE SELECT] is displayed in the [Discrete] field.
For discrete tests and analysis parameters, see below.
(➤**P.7-8** "Table of discrete tests and their corresponding analysis parameters")

● **[Channel]**

[Analyze PLT-F Channel]	Select this check box to enable the analysis of the PLT-F channel. You can select this check box only when the order includes the PLT parameter.
[Analyze WPC Channel]	Select this check box to enable the analysis of the WPC channel. You can select this check box only when the order includes the DIFF parameter.

2 Click [OK].

The dialog box closes, and the analysis order is registered (or modified).
To register continuously, click [Continuous Registration].
* In the Modify dialog box, [Continuous Registration] does not appear.

[Continuous Registration]	The entered analysis order is registered and the next analysis order can be registered.

Note:

If a discrete test in not selected under [Discrete], or if the [Sample No.] field is blank or set to "0", the [OK] button and [Continuous Registration] button are grayed out and cannot be clicked.

Table of discrete tests and their corresponding analysis parameters

Default Discrete Tests	Analysis parameters											
	WBC	RBC	HGB	HCT	MCV	MCH	MCHC	PLT*1	RDW-SD/ RDW-CV/ PDW/MPV/ P-LCR/PCT	NRBC# NRBC%	NEUT%/LYMPH%/ MONO%/EO%/BASO%/ NEUT#/LYMPH#/ MONO#/EO# / BASO#	RET%/RET#/ IRF/LFR/ MFR/HFR
CBC*2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-
CBC+DIFF*2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
CBC+DIFF+RET*3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CBC+RET*3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓
CBC+PLT-F*3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-
CBC+DIFF+PLT-F*3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
CBC+DIFF+RET+PLT-F*2,3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CBC+RET+PLT-F*3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓
CBC+DIFF+WPC*3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
CBC+DIFF+RET+WPC*3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CBC+DIFF+PLT-F+WPC*3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
CBC+DIFF+RET+PLT-F+WPC*3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FREE SELECT	If a combination other than the above default discrete tests is selected, [FREE SELECT] is displayed.											
FREE SELECT+WPC	This is displayed when the condition for [FREE SELECT] is met, and the [Analyze WPC Channel] check box is selected.											
FREE SELECT+PLT-F	This is displayed when the condition for [FREE SELECT] is met, and the [Analyze PLT-F Channel] check box is selected.											
FREE SELECT+PLT-F+WPC	This is displayed when the condition for [FREE SELECT] is met, and the [Analyze WPC Channel] and the [Analyze PLT-F Channel] check boxes are both selected.											

*1 In addition, depending on the specified analysis conditions, the analysis results from [RBC/PLT], [PLT-F], or a combination of [RBC/PLT] and [RET] channel will be used.

*2 During [Pre-Dilution] mode, you can use only these discrete tests. [RET] and [PLT-F] do not appear with all analyzer types.

*3 Cannot be used depending on the analyzer type.

7.1.3 Sorting analysis orders

You can sort analysis orders by the conditions that you specify.
Follow the steps below to sort analysis orders.

1 Click the [Sort] button on the toolbar.

The dialog box on the right appears.

2 Populate the displayed fields.

In fields [1st Key] through [4th Key], specify the sort conditions.
The sort conditions are prioritized from [1st Key] to [4th Key].
After selecting the keys, sort the alphanumeric in [Asc.] (0 to 9, A to Z) or [Desc.] (9 to 0, Z to A) order.

[Date]	Sorts by date and time of registration.
[Sample No.]	Sorts by sample number.
[Rack No.]	Sorts by rack number.
[Tube Pos.]	Sorts by sample tube position number.
[None]	Condition not specified.

3 Click [OK].

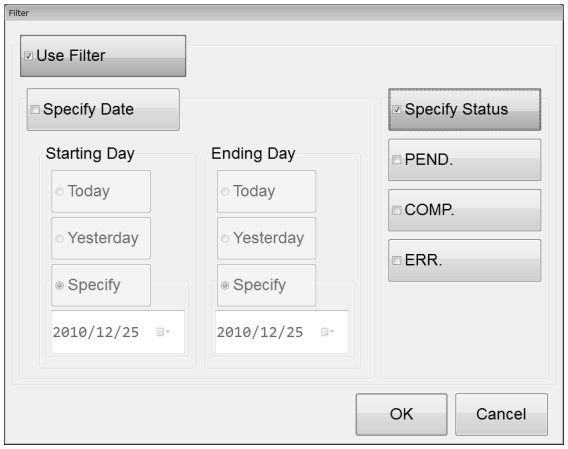
The dialog box closes, and sorting is applied.

7.1.4 Specifying data display conditions (filter)

You can specify conditions for the data you want displayed.
Follow the steps below to specify conditions for the data you want displayed.

1 Click the [Filter] button on the toolbar.

The dialog box on the right appears.
If a pending order is displayed, the [Filter] button is grayed out and cannot be clicked.



2 Populate the displayed fields.

The following items appear in the dialog box.

[Use Filter]	Selecting this check box will display only the orders that match the specified conditions. If you clear the check box, the settings will be grayed out and cannot be selected.
[Specify Date]	Select this check box to restrict the data to display by date.
[Starting Day] / [Ending Day]	Click to select [Today], [Yesterday] or [Specify]. Selecting [Specify] allows you to specify the date. In the field below [Specify], enter the date in the format "Year (4 digits)/Month (2 digits)/Date (2 digits)". If you click the button on the right edge of the input field, a calendar appears. You can also enter the date by selecting from this calendar.
[Specify Status]	Select this check box to specify the status of the analysis order you want displayed.
[PEND.]	Select this check box to display orders that have not been analyzed.
[COMP.]	Select this check box to display orders whose analysis have been completed.
[ERR.]	Select this check box to display orders in which an analysis error has occurred.

3 Click [OK].

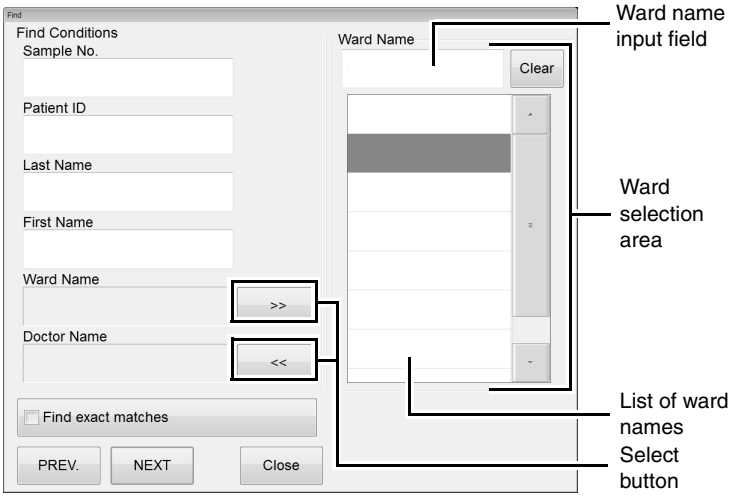
The dialog box closes and the specified data appear.

7.1.5 Searching analysis orders

You can search for a specific analysis order.
Follow the steps below to search for an analysis order.

1 Click the [FIND] button on the toolbar.

The dialog box on the right appears. When the dialog box is started, the ward name / doctor name selection field is not displayed.



When the Ward selection area is displayed

> **Note:**
> The doctor selection area is similar to the above dialog box. Please refer to it.

2 Populate the displayed fields.

The following items appear in the dialog box.

● **[Find Conditions]**

[Sample No.]	Enter the patient's sample number. You can enter up to 22 characters.
[Patient ID]	Enter the patient's ID. You can enter up to 16 characters.
[Last Name]	Enter the patient's last name. You can enter up to 20 characters.
[First Name]	Enter the patient's first name. You can enter up to 20 characters.
[Ward Name]	Displays the selected ward name.
Select button	Clicking the button displays the ward selection area on the right side of the dialog box.
[Doctor Name]	Displays the selected doctor for the patient.
Select button	Click to cancel the ward name / doctor name filter.

● **Ward / Doctor selection area**

Ward name / Doctor name input field	Enter a condition to narrow down the ward names / doctor names. You can enter up to 20 characters.
List of ward names / doctor names	Displays the ward names / doctor names that contain the condition that you entered. Click to select the ward name / doctor name. You can only select one ward name / doctor name.
[Clear]	Click to clear the selected ward name / doctor name.

Note:

You can enter "?" and "*" as substitution characters in your search.

"?": A "?" is used in place of any one character.
e.g. If you search for "99?99", "99099", "99999", and "99A99" are all selected.

"*": A "*" is used in place of zero or more characters.
e.g. If you search for "9*9", "909", "9119", and "99A99" are all selected.

3 Specify the search condition.

If you want to find orders that match the specified conditions exactly, select the [Find exact matches] check box. If you clear the check box, it will also find orders that partially match the specified conditions.

4 Click [PREV.] / [NEXT].

An order that matches the search conditions is selected in the list pane.

[PREV.]	Click to search up from the analysis order selected in the list pane.
[NEXT]	Click to search down from the analysis order selected in the list pane.

5 Click [Close].

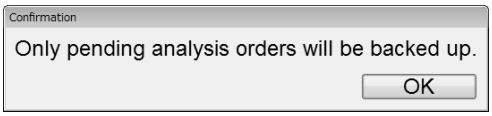
The dialog box closes.

7.1.6 Saving pending order (backup)

You can save all of the registered pending orders in one file.
Follow the steps below to save pending analysis orders.

1 Click the [File] button - [Backup] on the toolbar.

The dialog box on the right appears.



Note:
If there are no pending orders, [Backup] is grayed out and cannot be clicked.

2 Click [OK].

The [Save As] dialog box appears.

3 Specify the save folder.

4 Enter the file name.

The file extension is ".odr".

Note:
The default file name is in the format [XN][Software version][Order][Date of save_Time of save].odr.
e.g. [XN][00-01][Order][20100505_080808].odr

5 Click [Save].

All registered pending orders are saved.

Information
In the patient information that is associated with the order, only [Patient ID] is backed up regardless of the setting. To back up other patient information, back up from patient registration.

7.1.7 Restoring saved pending orders

You can restore saved pending orders.
Follow the steps below to restore saved pending orders.

1 Click the [File] button - [Restore] on the toolbar.

The [Open] dialog box appears.

2 Select the name of the file you want to restore.

The file extension is ".odr".

3 Click [Open].

Pending orders are restored.

Note:

- Once the number of registered orders exceeds 2,000, any subsequent new registration will overwrite the oldest registered order.
- If a registered data already exists with the same value for the items below, a dialog box appears to confirm overwriting.
  - [Sample No.]
  - [Rack No.] and [Tube Pos.]
- Because of the analyzer's structure, the orders which cannot be registered are deleted when the orders including the items that cannot be analyzed are restored.

7.1.8 Displaying only the pending orders

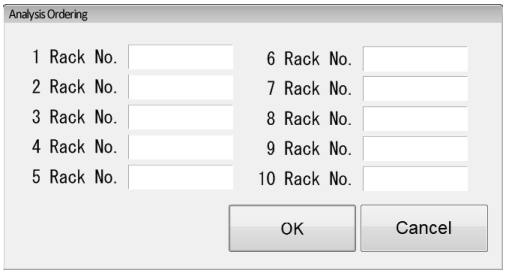
Displaying only pending analysis orders in the order list is possible.
Click the [Pending] button on the toolbar to display pending orders.

7.1.9 Downloading analysis orders

Analysis orders can be downloaded from the host computer.
Follow the steps below to download analysis orders.

1 Click the [Download] button on the toolbar.

The dialog box on the right appears.



2 Enter the [Rack No.].

Enter the rack number of the analysis order you want to download.
You can enter up to 6 characters.
You can query up to 10 orders.

3 Click [OK].

The analysis orders are downloaded from the host computer using the rack number that you entered.

Note:

- If the host computer is not connected, if the order request item is set to [Sample No.], [OK] is grayed out and cannot be clicked.
- Once the number of registered orders exceeds 2,000, any subsequent new orders will overwrite the oldest registered order.
- If the [Patient ID], [Ward Name] and/or [Doctor Name] of a downloaded analysis order are the same as an already registered order, they are overwritten.
- If a communication error occurs while downloading, the downloaded orders are registered. The orders which does not finish downloaded are not registered.
- If the downloaded analysis order and the already registered pending order have the same [Rack No.] and [Tube Pos.], a dialog box appears to confirm overwriting.
- Because of the analyzer's structure, the orders which cannot be registered are deleted when the orders including the items that cannot be analyzed are restored.

7.1.10 Deleting analysis orders

Follow the steps below to delete analysis orders selected in the order list.

1 In the list pane, click the order you want to delete.

The order is selected.
You can select multiple items.

2 Click the [Delete] button on the toolbar.

The dialog box on the right appears.

3 Click [OK].

The dialog box closes, and the order is deleted.

7.2 Patient List functions

Use the Patient List functions to display, register, modify, save, restore and delete patient information, ward names, and doctor names.

Opening / switching to [Patient List] screen

Clicking the [Patient List] icon in the Menu screen displays the [Patient List] screen.
Clicking the tab switches the view.

* The procedures for using the functions in the [Patient List] screen are same as the [Work List] screen. For information on saving, restoring, and deleting patient information, see the procedures for using the [Work List] screen.

● **Saving [Patient Information]**

You can back up all of [Patient Information], [Ward Name], and [Doctor Name] into a single file. The file extension is ".pat". Refer to the following procedures in the [Work List] screen.
(➤**P.7-13** "7.1.6 Saving pending order (backup)")

Note:

The default file name is in the format [XN][Software version][Patient][Date of save_Time of save].pat
e.g. [XN][00-01][Patient][20100505_080808].pat

Information

If [Include patient information] is selected in [Security Settings], patient information is output to the backup file. If [Output patient information] is selected, patient information is output to a CSV file. For the details on the security settings, see "Administrator's Guide".
(➤Administrator's Guide, "Chapter 4: 4.3.2 System settings")

● **Restoring saved [Patient Information]**

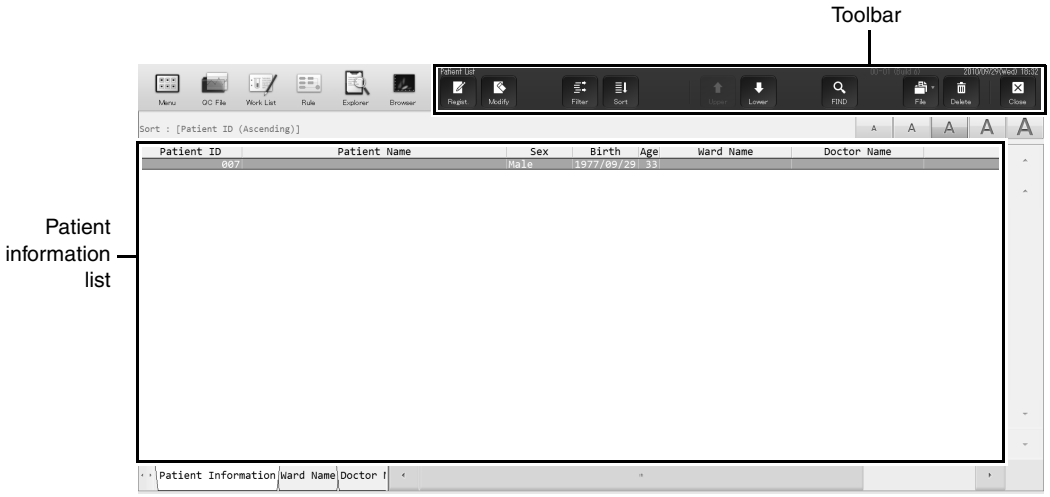
You can restore the [Patient Information], the [Ward Name], or the [Doctor Name] from the backup patient information. The file extension is ".pat". Refer to the following procedures in the [Work List] screen.
(➤**P.7-14** "7.1.7 Restoring saved pending orders")

● **Deleting [Patient Information], [Ward Name], and/or [Doctor Name]**

Perform this operation while the screen corresponding to the item to be deleted is displayed. Refer to the following procedures in the [Work List] screen.
(➤**P.7-16** "7.1.10 Deleting analysis orders")

7.2.1 Patient Information screen

Clicking the [Patient Information] tab displays the following screen.
In the [Patient Information] screen, you can sort, filter, search, save and restore patient information. You can register patient information for up to 10,000 patients.



[Patient Information] screen

● Toolbar

The button of the following functions are displayed.

[Regist.]	Click to display the [Register Patient Information] dialog box.
[Modify]	Click to display the [Modify Patient Information] dialog box for the selected patient information.
[Filter]	Click to display the dialog box that allows you to set the conditions for the data to be displayed in the patient information list.
[Sort]	Click to display the dialog box that allows you to set the sort order for the data to be displayed in the patient information list.
[Upper]	Click to move the selection up by one row.
[Lower]	Click to move the selection down by one row.
[FIND]	Click to display a dialog box that allows you to search data.
[File]	Click to display a submenu. This can be used to save and restore data.
[Delete]	Click to display a dialog box that allows you to delete the selected patient information.

● **Patient information list**

Displays the registered patient information.

[Patient ID]	Displays the patient's ID.
[Patient Name]	Displays the name of the patient (first name, last name).
[Sex]	Displays the patient's gender.
[Birth]	Displays the patient's date of birth.
[Age]	Displays the patient's age.
[Ward Name]	Displays the patient's ward name or the name of the clinical service.
[Doctor Name]	Displays the name of the doctor assigned to the patient.
[Patient Comment]	Displays comments about the patient.

7.2.2 Registering and modifying patient information

This section explains how to register and modify patient information.

Registering patient information

Click the [Regist.] button on the toolbar to display the following dialog box.

[Register Patient Information] dialog

Modifying patient information

From the list pane, double-click the patient information you want to modify. The [Modify Patient Information] dialog box appears. Alternatively, you can also select the patient information you want to modify, and then click the [Modify] button on the toolbar.

The fields in the [Modify Patient Information] dialog box are the same as those in the [Register Patient Information] dialog box*. Please refer to it.

Follow the steps below to register or modify patient information.

* [Continuous Registration] does not appear.

1 Populate the displayed fields.

[Patient ID]	For new registrations, you can enter the patient ID. You can enter up to 16 characters. You cannot modify it. The patient ID cannot be changed when modifying information.
[Last Name]	Enter the patient's last name. You can enter up to 20 characters.
[First Name]	Enter the patient's first name. You can enter up to 20 characters.
[Birth]	Enter the patient's date of birth. Enter it in the format "Year (4 digits)/Month (2 digits)/ Date (2 digits)". If you click the button on the right edge of the input field, a calendar appears. You can also enter the date by selecting from this calendar. A delete button is displayed on the right side of [Birth] field. Clicking it will clear the [Birth] field.
[Age]	Enter the patient's age. This is automatically displayed once the date of birth is entered.
[Sex]	Select the patient's gender.
[Ward Name]	Select the patient's ward name or the name of the clinical service.
[Doctor Name]	Select the doctor assigned to the patient.
[Patient Comment]	Input comments about the patient. You can enter up to 100 characters.

2 Click [OK].

The dialog box closes, and the patient information is registered (or modified).
Clicking [Continuous Registration] registers the [Patient Information] that you just entered, and allows you to register the next [Patient Information]*.

* In the Modify dialog box, [Continuous Registration] does not appear.

Note:

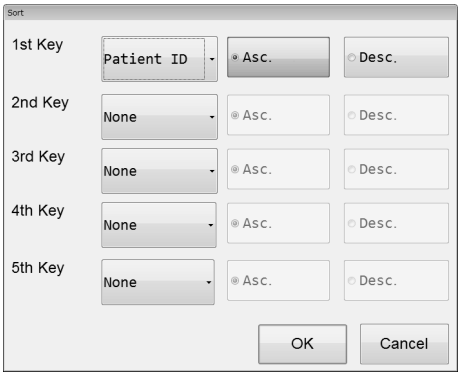
Once the number of registered orders exceeds 10,000, any subsequent new registration will overwrite the oldest registered order.

7.2.3 Sorting patient information

You can sort patient information by the condition that you specify.
Follow the steps below to sort patient information.

1 Click the [Sort] button on the toolbar.

The dialog box on the right appears.



2 Populate the displayed fields.

In fields [1st Key] through [5th Key], specify the sort keywords. The sort conditions are prioritized from [1st Key] to [5th Key]. After selecting the keys, sort the alphanumeric in [Asc.] (0 to 9, A to Z) or [Desc.] (9 to 0, Z to A) order.

[Patient ID]	Sorts by patient's ID.
[Last Name]	Sorts by patient's last name.
[First Name]	Sorts by patient's first name.
[Age]	Sorts by patient's age.
[Sex]	Sorts by patient's gender.
[None]	Condition not specified.

3 Click [OK].

The dialog box closes, and sorting is applied.

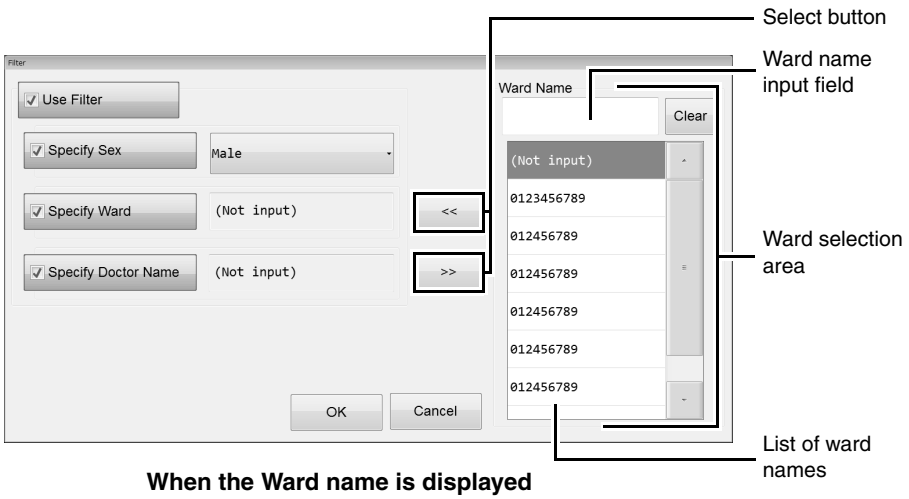
7.2.4 Specify conditions for the patient information to display (filter)

You can specify conditions for the data you want displayed in the patient information list.
Follow the steps below to specify conditions for the data you want displayed.

1 Click the [Filter] button on the toolbar.

The following dialog box appears.

* When the dialog box is started, the ward name / doctor name selection field is not displayed.



When the Ward name is displayed

Note:

The doctor selection area is similar to the above dialog box. Please refer to it.

2 Populate the displayed fields.

The following items appear in the dialog box.

[Use Filter]	Selecting this check box will display only the orders that match the specified conditions. If you clear the check box, the following settings will be grayed out and cannot be selected.
[Specify Sex]	Selecting this check box enables you to specify the patient's gender.
[Specify Ward]	Selecting this check box enables you to specify the patient's ward.
Select button	Clicking the button displays the ward selection area on the right side of the dialog box.
[Specify Doctor Name]	Selecting this check box enables you to specify the name of the patient's doctor.
Select button	Clicking the button displays the doctor selection area on the right side of the dialog box.

● **Ward / Doctor selection area**

Ward name / Doctor name input field	Enter a condition to narrow down the ward names / doctor names. You can enter up to 20 characters.
List of ward names / doctor names	Displays the ward names / doctor names that contain the condition that you entered. Click to select the ward name / doctor name. You can only select one ward name / doctor name.
[Clear]	Click to cancel the ward name / doctor name filter.

3 Click [OK].

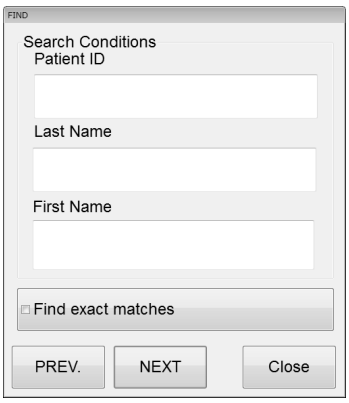
The dialog box closes.
Only the patient information that match all of the specified criteria are displayed.

7.2.5 Searching for patient information

You can search for specific patient information.
Follow the steps below to search for patient information.

1 Click the [FIND] button on the toolbar.

The dialog box on the right appears.



2 Populate the displayed fields.

[Patient ID]	Enter the patient ID. You can enter up to 16 characters.
[Last Name]	Enter the patient's last name. You can enter up to 20 characters.
[First Name]	Enter the patient's first name. You can enter up to 20 characters.

Note:

You can enter "*" and "?" as substitution characters in your search.

"?": A "?" is used in place of any one character.
e.g. If you search for "99?99", "99099", "99999" and "99A99" are all selected.

"*": A "*" is used in place of zero or more characters.
e.g. If you search for "9*9", "909", "9119" and "99A99" are all selected.

3 Specify the search condition.

If you want to find patient informations that match the specified conditions exactly, select the [Find exact matches] check box. If you clear the check box, it will also find patient informations that partially match the specified conditions.

4 Click [PREV.] / [NEXT].

An patient information that matches the search conditions is selected in the list pane.

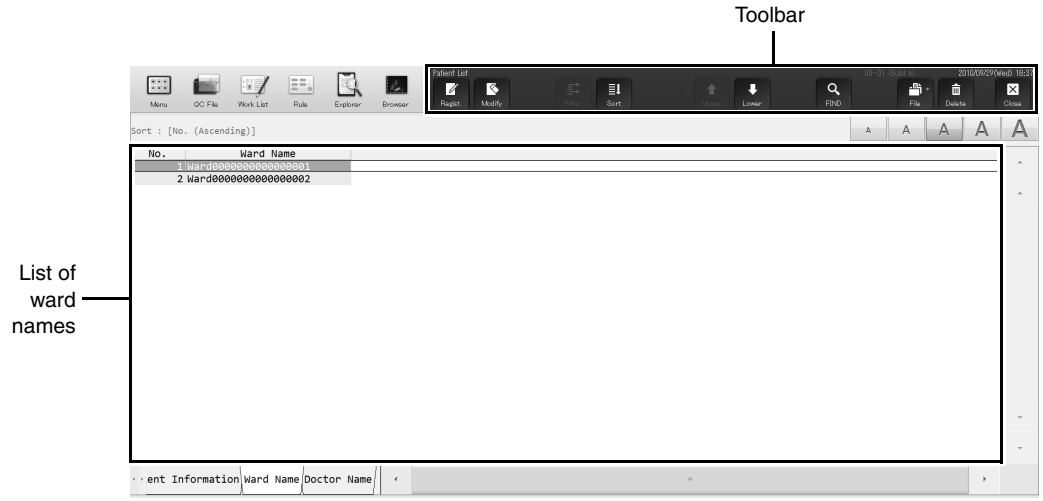
[PREV.]	Click to search upward from the ward name selected in the list.
[NEXT]	Click to search downward from the ward name selected in the list.

5 Click [Close].

The dialog box closes.

7.2.6 Ward Name screen

Clicking the [Ward Name] tab displays the following screen.
In the [Ward Name] screen, you can sort and search ward names. You can register up to 200 ward names.



● Toolbar

The button of the following functions are displayed.

[Regist.]	Click to display the [Register Ward Name] dialog box.
[Modify]	Click to display the [Modify Ward Name] dialog box for the selected ward name.
[Sort]	Click to display the dialog box that allows you to set the conditions for the data to be displayed in the ward name list.
[Upper]	Click to move the selection up by one row.
[Lower]	Click to move the selection down by one row.
[FIND]	Click to display a dialog box that allows you to search data.
[Delete]	Click to display a dialog box that allows you to delete the selected ward name.

● List of ward names

[No.]	Displays the ward number.
[Ward Name]	Displays the name of the ward.

Note:

For instructions on the following tasks in the [Ward Name] screen, see the procedures for the [Patient Information] screen.

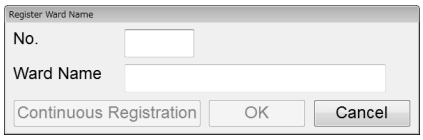
- Sorting ward names
  (➤**P.7-21** "7.2.3 Sorting patient information")
- Searching for a ward name
  (➤**P.7-23** "7.2.5 Searching for patient information")
- Deleting ward names
  (➤**P.7-16** "7.1.10 Deleting analysis orders")

7.2.7 Registering and modifying ward names

You can register and modify ward names from the [Ward Name] screen.

Registering a ward name

Click the [Regist.] button on the toolbar to display the dialog box on the right.



[Register Ward Name] dialog

Modifying a ward name

From the list pane, double-click the ward name you want to modify. The [Modify Ward Name] dialog box appears. Alternatively, you can also select the ward name you want to modify, and then click the [Modify] button on the toolbar.

The fields in the [Modify Ward Name] dialog box are the same as those in the [Register Ward Name] dialog box. Please refer to it.

Follow the steps below to register or modify a ward name.

1 Populate the displayed fields.

[No.]	For new registrations, the minimum number that has not been registered is automatically generated. You can change the displayed number. Any number between 0 and 200 can be entered. The number cannot be changed when modifying information.
[Ward Name]	Enter the name of the ward. You can enter up to 20 characters.

2 Click [OK].

The dialog box closes, and the ward name is registered (or modified).

Clicking [Continuous Registration] registers the [Ward Name] that you just entered, and allows you to register the next [Ward Name]*.

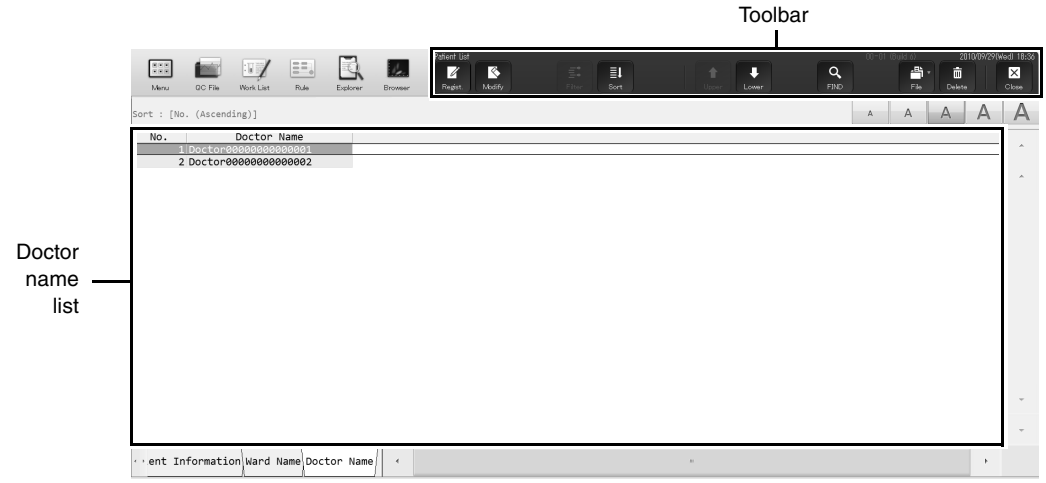
* In the Modify dialog box, [Continuous Registration] does not appear.

Note:

If 200 records have been registered, the [Regist.] button on the toolbar is grayed out and cannot be clicked.

7.2.8 Doctor Name screen

Clicking the [Doctor Name] tab displays the following screen.
In the [Doctor Name] screen, you can sort and search for doctor names. You can register up to 200 doctor names.



● Toolbar

The button of the following functions are displayed.

[Regist.]	Click to display the doctor name registration dialog box.
[Modify]	Click to display the Modify dialog box for the selected doctor name.
[Sort]	Click to display the dialog box that allows you to set the conditions for the data to be displayed in the doctor name.
[Upper]	Click to move the selection up by one row.
[Lower]	Click to move the selection down by one row.
[FIND]	Click to display a dialog box that allows you to search data.
[Delete]	Click to display a dialog box that allows you to delete the selected doctor name information.

● Doctor name list

[No.]	Displays the doctor number.
[Doctor Name]	Displays the doctor's name.

Note:

For instructions on the following tasks in the [Doctor Name] screen, see the procedures for the [Patient Information] screen.

- Sorting doctor names
  (➤**P.7-21** "7.2.3 Sorting patient information")
- Searching for a doctor name
  (➤**P.7-23** "7.2.5 Searching for patient information")
- Deleting doctor names
  (➤**P.7-16** "7.1.10 Deleting analysis orders")

7.2.9 Registering and modifying doctor names

You can register and modify doctor names from the [Doctor Name] screen.

Note:

The steps for registering and modifying a doctor name are the same as those for registering and modifying a ward name.
(➤**P.7-26** "7.2.7 Registering and modifying ward names")

Chapter 8 Performing Quality Control

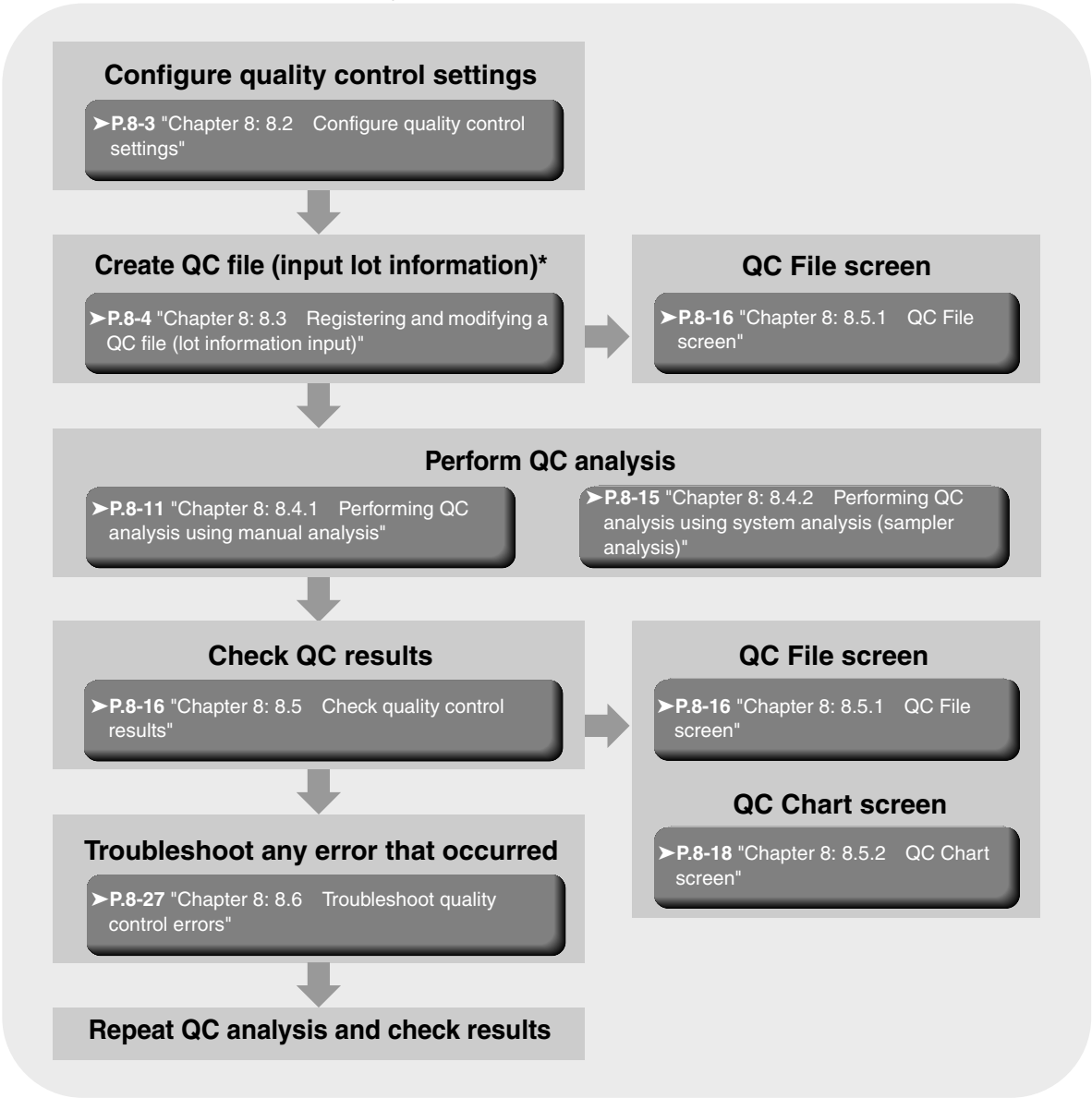
This chapter explains how to perform quality control tasks.

8.1 Introduction

Quality control is the routine monitoring of performance using commercial or patient controls. Controls with known characteristics are analyzed and compared to the known characteristics using statistical methods. This allows changes to performance to be detected and then action can be taken if these changes are significant.

8.1.1 Quality control workflow

Follow the steps below to perform quality control.



* This step is not necessary if you are using the automatic lot registration function.

8.1.2 Types of quality control

The following types of quality control methods exist. Use the appropriate method according to your needs.

QC methods using control material

- **X-bar Control**: The control blood is analyzed twice in succession, and the average of the 2 results is used as the control data.
- **L-J Control**: Takes the data from a single analysis of control blood and uses it as the control data.

QC using normal samples

X-barM Control: This program calculates a weighted average of batches of normal patient samples (usually 20) and plots the resulting value as control data. The number of samples can be set to any number.

8.1.3 About the timing of QC analysis

Quality control is performed in order to monitor an instrument's performance over time.
XN CHECK is the quality control material used to monitor the performance of the XN analyzer.
Quality control should be run according to licensing agency regulations.
It should be noted that for troubleshooting purposes, additional control runs may be necessary.

Note:

You can periodically display a message to prompt the user to perform quality control tasks (quality control alarm).

8.1.4 Quality control materials

When performing X-bar control or L-J control, use dedicated control blood.

● **Types of control blood**

XN CHECK Level 1
XN CHECK Level 2
XN CHECK Level 3
XN CHECK BF Level1
XN CHECK BF Level2

Information

- Only use the specified control blood. Control blood is specially designed to the analysis technology of the instrument.
- To execute the quality control using an external QC sample or a residual sample (pooled blood), set the [Material] to [Other].

8.2 Configure quality control settings

Before performing quality control tasks, configure the following settings.

- Method of quality control (X-bar Control or L-J Control)
- Settings related to limits
- X-barM batch setting

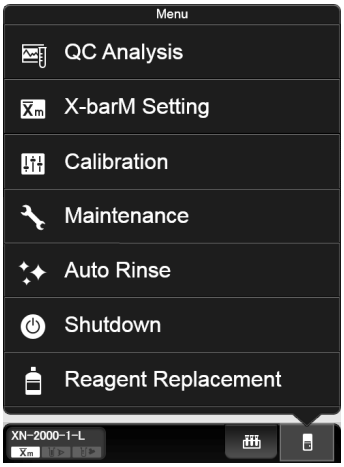
For explanation on how to configure these settings, see "Administrator's Guide".
(➤Administrator's Guide, "Chapter 4: 4.3.8 QC settings")

8.2.1 Activating / deactivating X-barM Control

X-barM control is executed each time the analyzer is started.
You can temporarily change this setting to not execute control.
Follow the steps below to configure X-barM control settings.

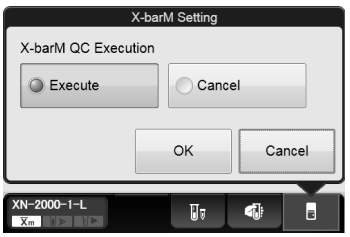
1 Click the Analyzer menu button on the control menu.

The menu on the right appears.



2 Click [X-barM Setting].

The dialog box on the right appears.
Click [Execute] to perform X-barM Control, or [Cancel] to cancel X-barM Control.



3 Click [OK].

8.3 Registering and modifying a QC file (lot information input)

To perform quality control tasks, QC files must be registered.
You can register up to 94 QC files per analyzer.

Register lot information using one of the methods below.

- Manual lot registration (➤**P.8-4** "8.3.1 Performing lot registration manually")
- Automatic lot registration (➤**P.8-10** "8.3.2 Performing lot registration automatically")
- Modifying lot information (➤**P.8-10** "8.3.3 Modifying lot information")

8.3.1 Performing lot registration manually

Follow the steps below to perform lot registration.

1 Click the [QC File] icon in the Menu screen.

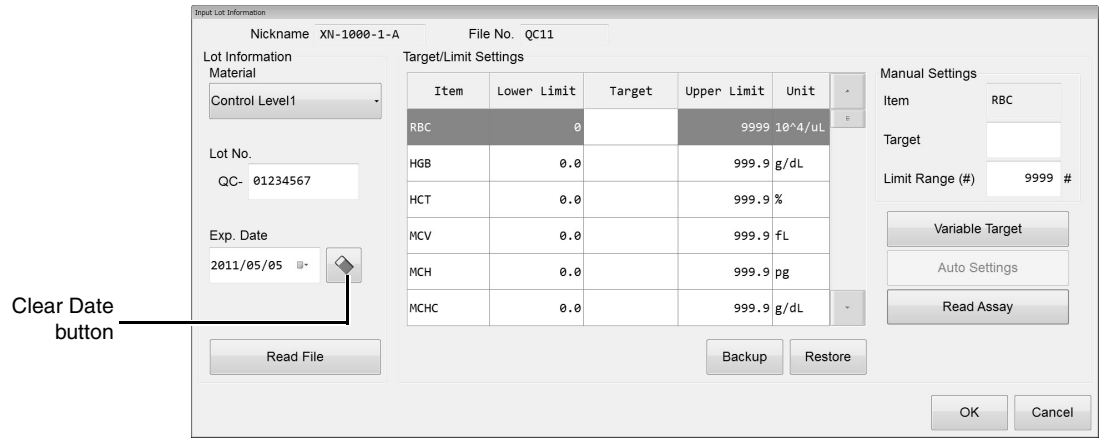
The [QC File] screen appears.

2 Click a tab and select an analyzer.

QC files are managed for each analyzer.Select the analyzer that you want to register.
For the tabs, see below.
(➤**P.8-16** "8.5.1 QC File screen")

3 Click the [Regist.] button on the toolbar.

The following dialog appears.



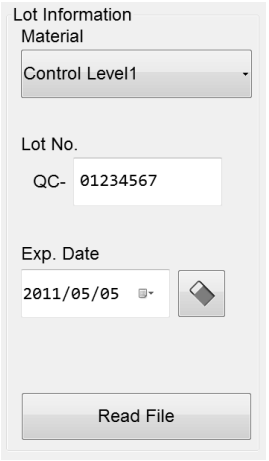
[Input Lot Information] dialog

4 Enter lot information.

● [Lot Information]

This section explains lot information settings.

[Material]	Select the type of control blood.
[Lot No.]	Enter the lot number. You can enter up to 8 alphanumeric characters.
[Exp. Date]	Displays the currently set date. You can also click and directly enter the date. Clear Date button: Click to clear the displayed date.

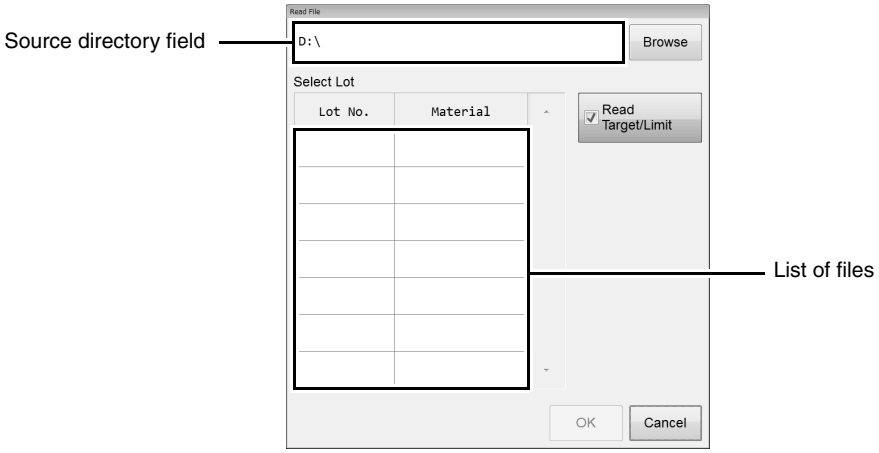


Information

If you modify the [Material], the values in the list of setting parameters in step 5 are reset to the values that appear when the [Input Lot Information] dialog box is opened.

● **[Read Assay File]**

Reads the lot information from the CD-ROM that came with the control blood, or from the specified folder. Clicking [Read Assay File] will display the following dialog box.



Source directory field	Displays the folder from which the file list will be imported. You can also specify the import destination by manual entry.
[Browse]	Click to display the dialog box for specifying the folder.
[Select Lot]	Displays the list of files on the CD-ROM. Select the file that you want to register.
[Read Target / Limit]	Select this check box if you want to read the target / limit of the selected QC item. If the check box is not checked, the target/limit values are reset to their default values which are shown when the dialog box is opened.

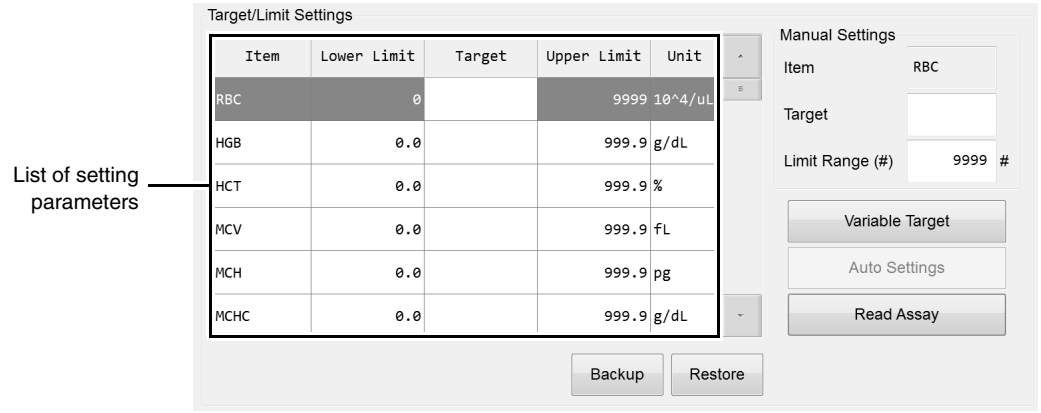
Note:

The lot number is registered as shown below in the assay file*.

- XN CHECK Level1: QC-XXXX1101
- XN CHECK Level2: QC-XXXX1102
- XN CHECK Level3: QC-XXXX1103
- XN CHECK BF Level1: QC-XXXX1301
- XN CHECK BF Level2: QC-XXXX1302

*A number for each lot appears in XXXX.

5 Set target and limit values.



● List of setting parameters

This section explains how to edit target values and limit values.

[Item]	The QC item name is displayed.
[Lower Limit]	The lower limit value is displayed.
[Target]	You can enter the target value. If left blank, a variable target is used, same as when you enter "0".
[Upper Limit]	The upper limit value is displayed.
[Unit]	The units of the QC item are displayed.

● [Manual Settings]

You can manually set the target and limit values for the selected QC item.

[Item]	Displays the name of the item currently selected in the list.
[Target]	Click to enter the target value of the item that is selected in the list.
[Limit Range (#)] / [Limit Range (%)]	Click to enter the limit value of the item that is selected in the list. Depending of the configuration, this is displayed as a numerical value (#), or a ratio (%).

● [Variable Target]

Specify this to quality control the QC files with arbitrary target values.
A function that automatically calculates the target values using the control data in the file. This function activates when the targets are set to blank for X-bar Control, L-J Control, and X-barM Control.

Click to designate the target value of the selected item as a variable.
Nothing will be displayed in the [Target] field of the applicable item. If a "0" is entered in the [Target], or if it is left blank, it will be processed as a variable target.

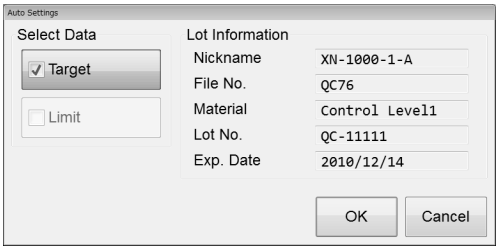
Note:

The average of the plots, excluding the latest plot, is set as the variable target.

The target values are calculated as follows:
If the number of plots is zero: 0*
If the number of plots is 1: value of the plot.
If the number of plots is 2 or more: Average value (excluding the latest plot)
*If the limit setting is ratio, the limit range will be 100% and the minimum number of digits will be displayed on the grid for each QC item.

● [Auto Setting]

Automatically sets the target and limit values for the selected QC item.
Clicking [Auto Setting] will display the dialog box on the right.



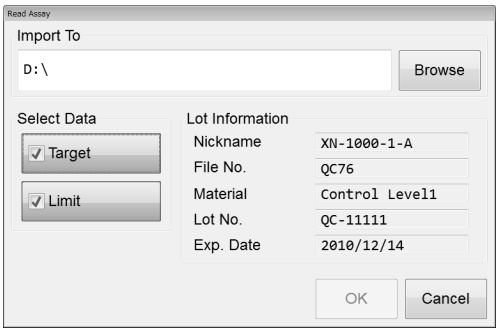
[Select Data]	When the respective check box(es) is selected, the value for [Target] and/or [Limit] fields will be automatically calculated.
[Lot Information]	Displays the lot information.

Information

If the QC data or the selected range of plots contains less than 3 plots, statistical data cannot be calculated for the limit, therefore the limit cannot be automatically set.

● [Read Assay Items]

Reads the assay targets and limits from the CD-ROM that came with the control blood, or from the specified folder. The file extension is ".qxn" or ".qbf".
Clicking [Read Assay Items] will display the dialog box on the right.



[Browse]	Click to display the dialog box for specifying the folder.
[Select Data]	When the respective check box(es) is selected, the value for [Target] and/or [Limit] fields will be read.
[Lot Information]	Displays the lot information.

● **[Backup]**

The [Save As] dialog box is displayed to let you save a target/limit backup file.

> **Note:**
> The Target/Limit values are saved as follows.
> [Analyzer ID][Software version][QCTargetLimit][File No.][Material][Lot No.].tlf

● **[Restore]**

The [Open] dialog is displayed to let you restore a target/limit backup file.

6 Click [OK].

The lot information is registered and the dialog closes.

> **Information**
> If lot information with a same number already exists in the analyzer for which you are registering the lot information, registration cannot be performed.

8.3.2 Performing lot registration automatically

When sampler analysis is performed, lot information is acquired immediately before analysis and registered in the QC file. The assay value file is read from the CD-ROM included with the control blood and the lot information is registered in the QC file.
Lot information (expiration date, target/limit values) is acquired from the lot number.
If 94 QC files are already saved, saving a new file deletes the oldest file from the data base.
If the oldest file is in use, the next oldest file that is not in use is deleted.

Note:

- A backup is kept of the deleted file as shown below.
  [Analyzer ID][Software version][QCFile][Date of save_Time of save][Material][Lot No.].qcf
- If the lot number after "QC-" is more than 8 digits long, registration will not be performed.

8.3.3 Modifying lot information

Follow the procedure below to modify lot information.

1 Click the [QC File] icon in the Menu screen.

The QC File screen appears.
For QC file, see below.
(➤**P.8-16** "8.5.1 QC File screen")

2 Select the QC file to be modified and click the [Modify] button on the toolbar.

The [Input Lot Information] dialog box appears.
For information on the [Input Lot Information] dialog box, see below.
(➤**P.8-4** "8.3.1 Performing lot registration manually")

The following items can be modified.

- Lot No
- Exp. Date.
- Target/Limit

Note:

[Material] cannot be modified, and thus the [Read File] button is grayed out and cannot be clicked.

8.4 Perform QC analysis

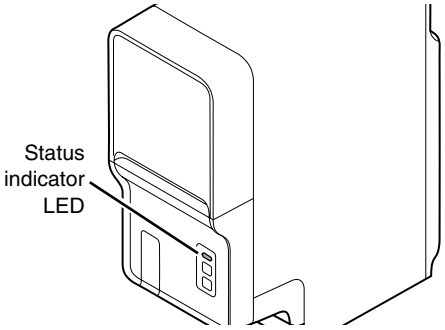
This section explains how to perform QC analysis.

8.4.1 Performing QC analysis using manual analysis

To perform body fluid analysis QC or QC using an external QC sample or remaining sample (pooled blood), perform manual analysis.To perform QC using an external QC sample or remaining sample (pooled blood), set [Material] to [Other].
Follow the steps below to perform QC analysis using manual analysis.

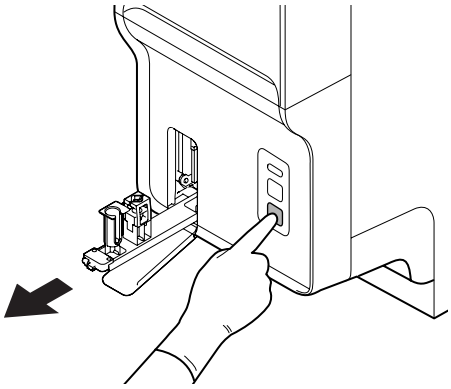
1 Check the Status indicator LED on the analyzer.

If the Status indicator LED is not lit green, wait until it does.



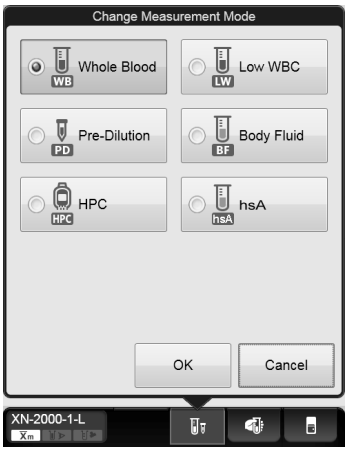
2 If the tube holder has not ejected out, press the mode switch.

The tube holder slides out forward.



3 Click the Change Analysis Mode button on the control menu.

The dialog box on the right appears.
If the sample is whole blood, select [Whole Blood] mode.
For body fluid, select [Body Fluid] mode.

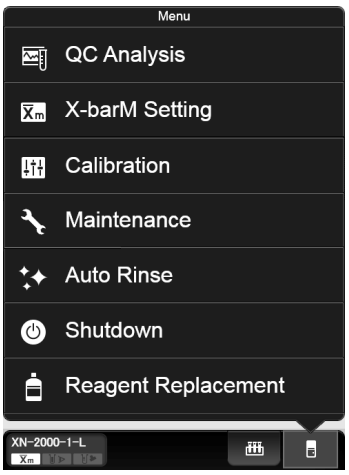


4 Click [OK].

The dialog box closes.

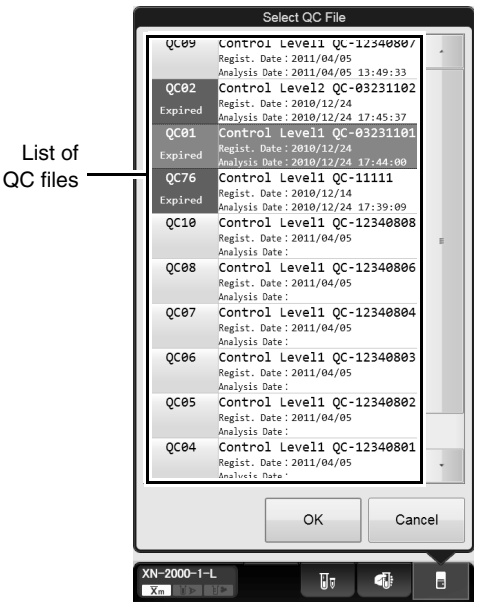
5 Click the Analyzer menu button on the control menu.

The menu on the right appears.



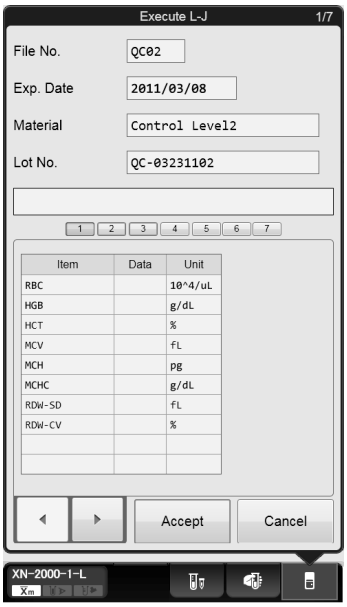
6 Click [QC Analysis].

The dialog box on the right appears.



7 From the list of QC files, click the file you want to analyze.

The dialog box on the right appears.



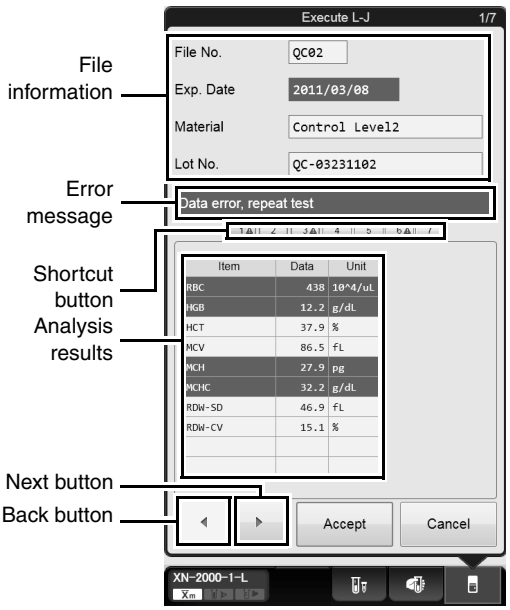
[Execute L-J] dialog

8 Analyze the sample using manual analysis.

For the details on analysis, see Chapter 9.
(➤**P.9-7** "Chapter 9: 9.3 Manual analysis" Step 5 and following steps)
For the procedure for analyzing body fluid, see Chapter 9.
(➤**P.9-11** "Chapter 9: 9.4 Body fluid analysis" Step 5 and following steps)

9 Check the analysis results.

When the analysis finishes, the analysis results are displayed in the [Execute L-J] dialog box.



File information	The information about the analyzed QC file is displayed.
Error Message	A message is displayed when there is an anomaly in the analysis results. [Check control chart]: Indicates that the analysis data exceeds the QC limit. [Data error, repeat test]: Indicates that the analysis data exceeds the QC limit by over three times. This is displayed in white font on red background.
Shortcut button	Click to display item screens that are not currently displayed. If the data in a screen includes a warning, a warning mark appears.
Analysis results	Displays the analysis results*. For L-J Control, data will be displayed for 1 analysis only. For X-bar Control, the sample is analyzed twice, and an average value is displayed. If there was an abnormality in the analysis results, the corresponding cells are highlighted in red. * The dialog box above is for L-J Control.
Back button	Click to display the previous screen.
Next button	Click to display the next screen.
[Accept]	Click to close the dialog and plot the analysis data onto QC charts.

For the details on checking your analysis results, see below.
(➤**P.8-16** "8.5 Check quality control results")

8.4.2 Performing QC analysis using system analysis (sampler analysis)

When using control blood, you can perform L-J Control by system analysis (sampler analysis).
Follow the steps below to perform QC analysis using system analysis (sampler analysis).
Use the special racks for QC. Racks for QC have a red label for identification.In the procedure below, racks with a barcode label beginning with "SRQA" are used as an example.
For the special racks that are used, see the "Administrator's Guide".
(➤Administrator's Guide, "Chapter 5: 5.3.1 Acceptable barcodes)

1 Place the vial containing control blood in the rack.

When using a new lot of control blood, you can automatically import QC data obtained from the server.
If the instrument is not configured to allow connection with the server, or if no network connection is available, insert the CD-ROM that came with the control blood into the IPU before analyzing, import the assay values, and register the lot information.
For importing assay values, see below.
(➤**P.8-4** "8.3 Registering and modifying a QC file (lot information input)")

2 Analyze the samples using system analysis (sampler analysis).

For procedures on analysis, see Chapter 9.
(➤**P.9-19** "Chapter 9: 9.7 Performing a system analysis (sampler analysis)")

Once the analysis is finished, the QC results are displayed on the IPU's screen.
For procedures on checking your analysis results, see below.
(➤**P.8-16** "8.5 Check quality control results")

Note:

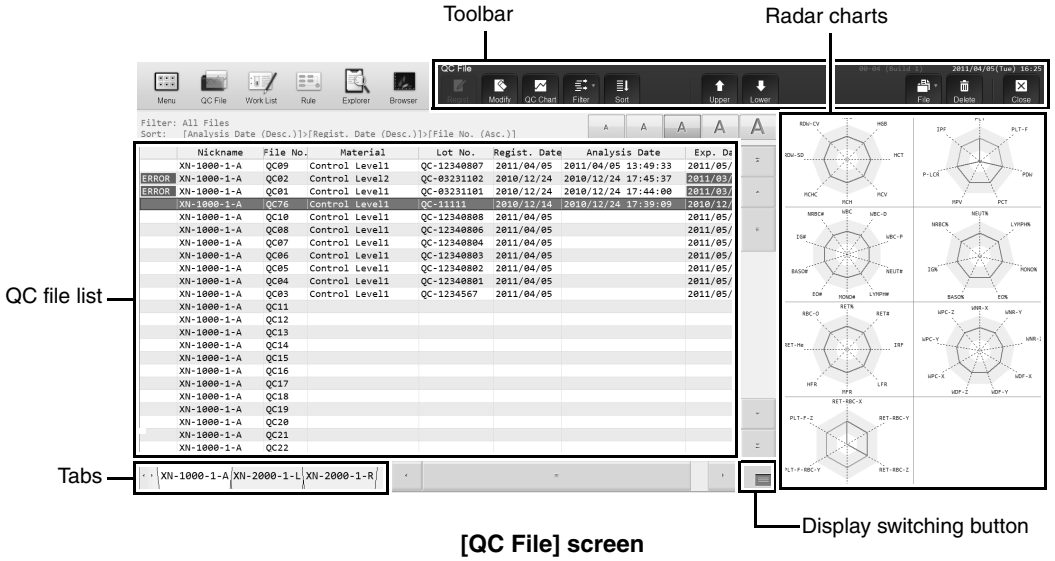
- QC can only be performed on one rack at a time.
- The rack and tube information received from the transportation system is checked to see whether it is a QC sample, when the sample number is assigned by the XN conveyor (CV-50).

8.5 Check quality control results

This section explains how to check the results from QC analysis.

8.5.1 QC File screen

In the [QC File] screen, you can check the latest QC results for the QC file that is selected in the list.
Clicking the [QC File] button on the toolbar, or the [QC File] icon on the Menu screen displays the following screen.



[QC File] screen

● Toolbar

The buttons of the following functions are displayed.

[Regist.]	Click to display the [Input Lot Information] dialog box.
[Modify]	Click to display the [Input Lot Information] dialog box in edit mode. The displayed controls and fields are the same as when manually registering a new QC file.
[QC Chart]	Click to display the [QC Chart] screen.
[Filter]	Click to display the submenu. Select either [All Files] or [Lot registration exists].
[Sort]	Sort the QC file list. Click to display the submenu.
[File No.]	Click to sort by file number in ascending order.
[Analysis Date]	Each time this is clicked, the sorting method changes in the following order: analysis date/time descending order – registration date descending order – file number ascending order.
[Sort]*	Click to sort by the sorting condition set in [Modify Settings]. * The name of [Sort] in the sub-menu can be changed using [Sort Name] in [Modify Settings].
[Modify Settings]	Click to open a dialog that lets you set the sorting condition. Select from [File No.], [Lot No.], [Regist. Date], or [Analysis Date].

[Upper]	Click to move the selection up by one row.
[Lower]	Click to move the selection down by one row.
[File]	Click to display a submenu. This can be used to save and restore data. The submenus are not displayed when the X-barM chart is displayed.
[Delete]	Click to display a dialog box that allows you to delete the selected QC file.

● QC file list

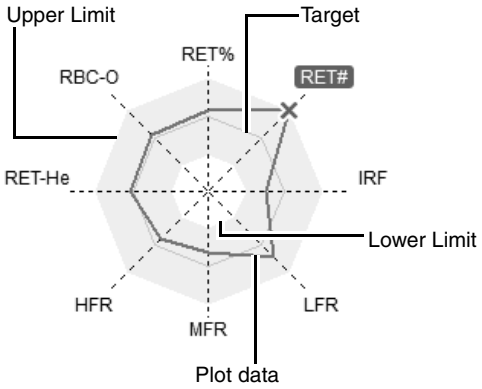
Displays a list of registered QC files.
If there is a problem with a QC data, "[Error]" is displayed in white font on red background, on the left side of the list of QC files.

● Tabs

Click to show data for a specific analyzer, or for all analyzers.

● Radar charts

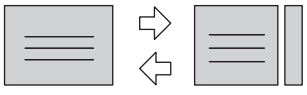
Displays the latest plot data from the selected QC file on the radar charts.
If there is not a single plot in the selected QC file, only the frame and the item name are displayed.
Any point exceeding the upper or lower limit is marked with a red "X".



Title	Displays the name of the analysis parameter (QC item). The displayed parameters vary with the QC method used. Any parameter exceeding the QC limit (upper or lower) will be highlighted in red.
Lower Limit	Indicates the lower QC limit.
Upper Limit	Indicates the upper QC limit.
Target	Indicates the target value.
Plot data	Indicates the plot data from the selected QC file.

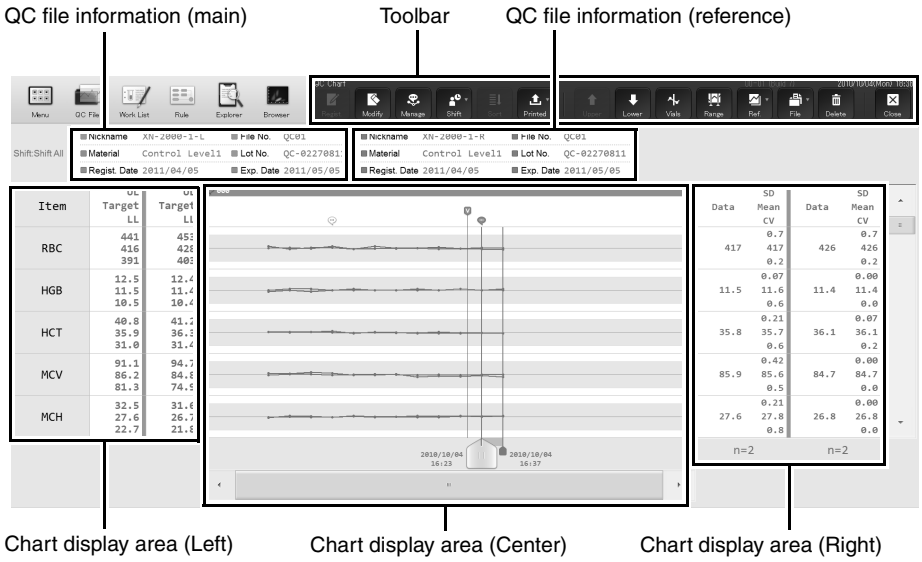
● Display switching button

You can click the display switching button to open/close the Radar charts (sub screens).



8.5.2 QC Chart screen

The [QC Chart] screen allows you to view detailed graph data of the QC file. Clicking the [QC Chart] on the [QC File] screen's toolbar displays the following screen.



[QC Chart] screen

● Toolbar

The buttons of the following functions are displayed.

[Regist.]	Click to display the [Input Lot Information] dialog box. The QC chart is not displayed if the lot information has already been registered.
[Modify]	Click to display the [Input Lot Information] dialog box in edit mode. The displayed controls and fields are the same as when manually registering a new QC chart.
[Manage]	Click to display the [Cursor Data Management] dialog box, which allows you to set the cursor data. (➤**P.8-22** "8.5.3 Configuring cursor data settings")
[Shift]	You can set up a maximum of 3 work shifts. This button switches the display between charts for each shift. To apply display by shift, select any shift between [Shift 1] to [Shift 3]. Selecting [Shift All] displays all shifts.
[Sort]	Click to display the sort dialog box. You can change the order of quality control items. This item does not appear when [Ref.] - [Compare Analyzers] is selected.
[Output]	Print the selected chart to various printers or a host computer. Click the [Output] button to select [Host Computer (HC)], [Report (GP)] or [Ledger (LP)].
[Upper]	Click to move the selection up by one row.
[Lower]	Click to move the selection down by one row.

[Vial]	You can display a vial line to indicate replacing of a vial with a new one. While the analysis data from the new vial is selected, click [Vial] to draw the vial line. Repeat the same procedure to delete the line. This button cannot be used in X-barM control. (➤**P.8-23** "8.5.4 Displaying the vial line")
[Range]	Click to display the QC chart in select range mode. When the number of plots on the QC chart is 1 and a lot has not been registered on the QC chart, the [Range] button cannot be selected. (➤**P.8-23** "8.5.5 Select range mode")
[Ref.]	Click to display the submenu.
[None]	Select this check box to cancel the reference function.
[Compare QC Files]	QC charts registered to the same analyzer are overlaid on top of each other for comparison. Compares the new lot with the current lot. (➤**P.8-25** "8.5.6 Compare QC Files")
[Compare Analyzers]	Compares QC files for the same material but registered to other analyzers. (➤**P.8-26** "8.5.7 Compare Analyzers")
[File]	Click to display a submenu. This can be used to save and restore data.
[Delete]	Click to display a dialog box that allows you to delete the selected data point.

● QC file information

Apart from the main QC file, you can compare its information with two additional QC files.
The information from each QC file is displayed in different colors.

[Nickname]	Displays the name of the analyzer for the QC chart.
[Material]	Displays the material registered for the QC file.
[Regist. Date]*	Displays the registration date of the material registered in the QC file.
[File No.]	Displays the QC file number.
[Lot No.]*	Displays the lot number registered for the QC file.
[Exp. Date]*	Displays the expiration date of the control blood for the QC file. When it has expired, it is displayed in white font on red background.

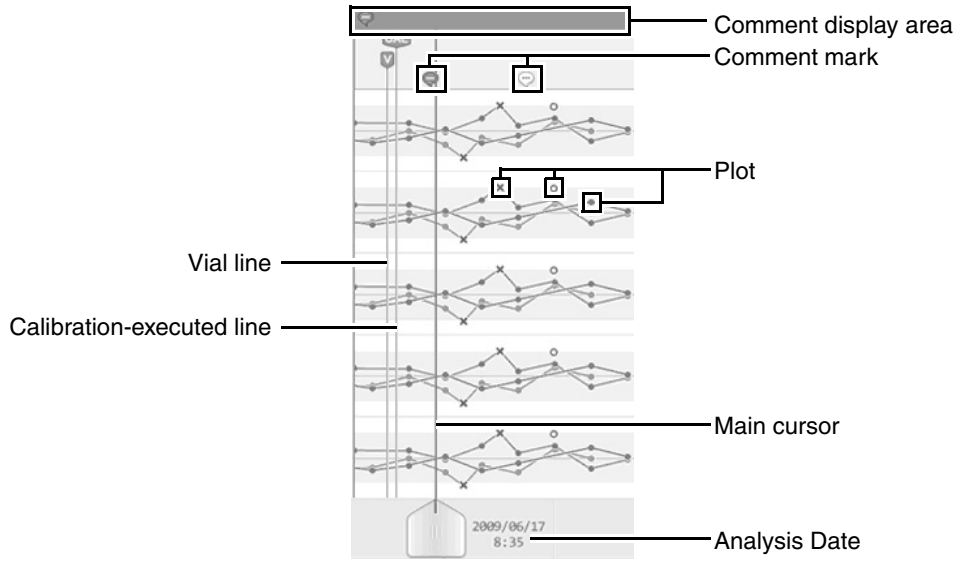
* Not displayed if [File No.] is X-barM.

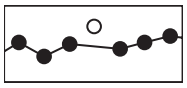
● Chart display area (Left)

[Item]	Displays the name of the QC item.
[UL]	Displays the upper control limit.
[Target]	Displays the control target value.
[LL]	Displays the Lower control limit.

● Chart display area (Center)

The analysis data are plotted cumulatively and displayed in the chart area as a line graph.
When comparing QC files, the line graphs are displayed in different colors for each QC file.



Comment display area		Displays comments.
Comment mark		Displayed when a comment exists for a QC chart. For the procedure for entering comments, see below. (➤**P.8-22** "8.5.3 Configuring cursor data settings")
		Indicates a comment for the cursor data. The comment is displayed in the comment display area.
		Indicates a comment for data other than the cursor data.
Plot	●	Displayed when the analysis data is within the range between the upper and lower limits.
	×	Displayed when the analysis data is outside the range between the upper and lower limits.
	○	Displayed when the analysis data is not managed. A plot for a data that is not managed is not connected by lines, as shown on the figure on the right.  A data that is not managed is displayed in this way even if it is outside the range between the upper and lower limits. For details on data that is not managed, see below. (➤**P.8-22** "8.5.3 Configuring cursor data settings")
Vial line		Indicates that the vial was switched to a new one.
Calibration-executed line		A calibration-executed line (a line to indicate that a calibration was performed) is displayed to the left of the first plot after the calibration. The calibration-executed line cannot be erased.

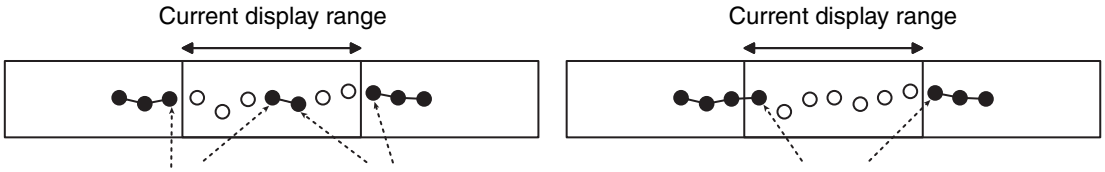
Main cursor		Indicated the currently selected data.
Analysis Date		Displays the date and time of analysis for the data selected by the cursor.

● **Chart display area (Right)**

[n=xx]	Displays the total number of all managed plots that appear in the chart display area.
[Data]	Displays the data specified by the main cursor. Values exceeding the [UL] value in the chart display area (right) are indicated by a [+], and values that are under the [LL] value are indicated by a [-].
[SD]	Displays the standard deviation calculated from all managed plots that appear in the chart display area.
[Mean]	Displays the average value calculated from all managed plots that appear in the chart display area.
[CV]	Displays the coefficient of variation calculated from all managed plots that appear in the chart display area.

Note:

- When the [QC Chart] screen is not in the range-selecting mode (when the only cursor displayed is the main cursor), this is called single-cursor mode.
- Once the number of datapoints exceeds 300, any subsequent new plot will overwrite the oldest data.
- If the displayed range of the QC chart contains plots that are not managed, the plots do not connect to the plots outside the displayed range.



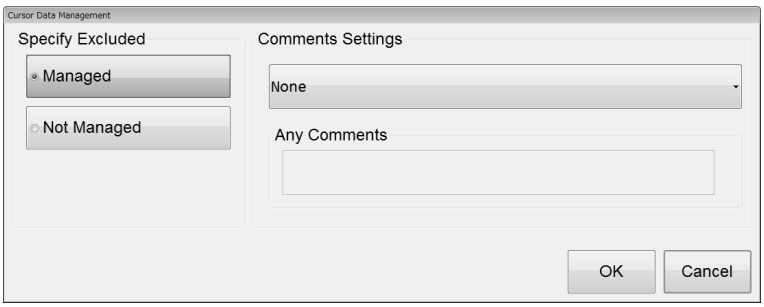
- The plots of data for which the data mask [- - - -] (this means non-analyzable) appears are not joined by the line.
  For the data masks, see below.
  (➤**P.10-9** "Chapter 10: 10.1.4 Numerical data of the analysis results")

8.5.3 Configuring cursor data settings

You can exclude the QC data selected by the cursor or add comments to it.
Follow the steps below to configure the cursor data settings.

1 Click the [Manage] button on the toolbar.

The following dialog box appears.



[Cursor Data Management] dialog box

[Specify Excluded]	Specify whether a QC data should be excluded from quality control. Use the cursor to select the QC data in question, and select whether or not they are to be managed*. If [Not Managed] is selected, the excluded data is not managed by the functions below. • Statistical computations (SD, Mean, CV) • Automatic limit computation • Variable target computation • Number of data points n * In X-barM control, this is always managed.
[Comments Settings]	A comment can be added to the QC data selected by the cursor.
[None]	Select this if you are not including any comment for the selected data.
[Input Any Comment]	Select this if you want to type a comment.
[Fixed Comments]	Select this if you want to use a comment from a list of preset comments. You can preset up to 10 user-defined comments. (➤Administrator's Guide, "Chapter 4: 4.3.8 QC settings")
[Any Comments]	Select this when [Input Any Comment] is selected in [Comments Settings]. You can enter up to 100 characters.

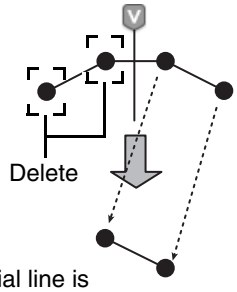
2 Click [OK].

The selected settings become reflected in each QC item.

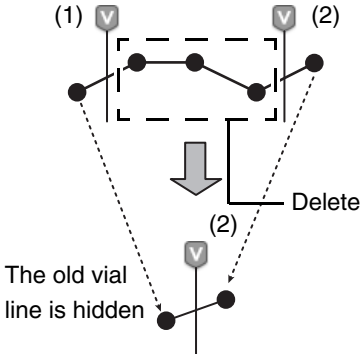
8.5.4 Displaying the vial line

The display of the vial line changes depending on the existence of a plot. The relationship between the vial line and the plot is as follows.

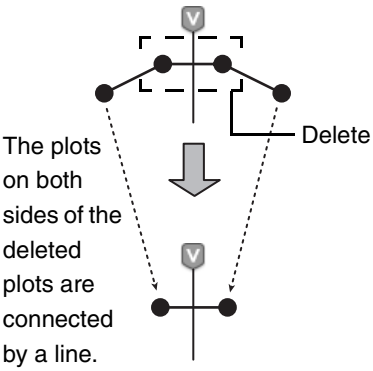
If all plots before the vial line are deleted



If all plots between the vial lines are deleted



If plots on both sides of the vial line are deleted

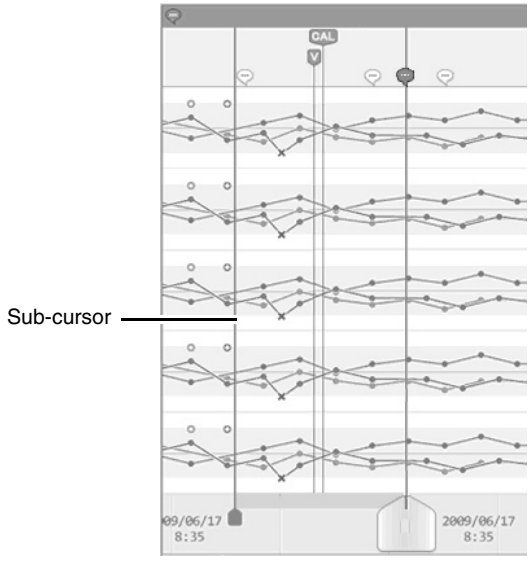


8.5.5 Select range mode

A main cursor and sub-cursor can be displayed on the QC chart, and the data between the two cursors can be manipulated. You can compare the analysis results at the start point indicated by the sub-cursor, with the statistics over any selected range.
When modifying lot information in select range mode, you can automatically configure target/limit settings for the plot of the selected range.

When you click on [Range] in the [QC Chart] screen, a sub-cursor appears.
The sub-cursor is fixed at the position where the main cursor was located.
The main cursor is used for scrolling to select a range, and can be moved by clicking on the end point of the range you want to select in the [QC Chart] screen.

Sub-cursor		Displayed in range-selecting mode. It indicates the start point of the selection.



In the range-selecting mode, the functions of some buttons on the toolbar and the layout of the [QC Chart] screen are different from the single-cursor mode.

● Toolbar

The buttons whose functions change are as follows.

[Shift]	If [Shift] is changed, range selection mode is canceled.
[Sort]	Sorts the displayed items.
[Manage]	The [Manage] button cannot be used.
[Ref.]	The range-selecting mode is automatically cancelled.
[Output]	The selected range of data can be output to an output destination.
[Delete]	The selected range of data can be deleted (only main chart data is deleted). Range selection mode is cancelled.

● Chart display area (Right)

[n=xx]	Displays the number of managed plots within the range selected by the cursors.
[Data]	The data at the sub-cursor (the original position) data is displayed.
[SD]	Displays the standard deviation calculated from the managed plots within the range selected by the cursors.
[Mean]	Displays the average value calculated from the managed plots within the range selected by the cursors.
[CV]	Displays the coefficient of variation calculated from the managed plots within the range selected by the cursors.

Note:

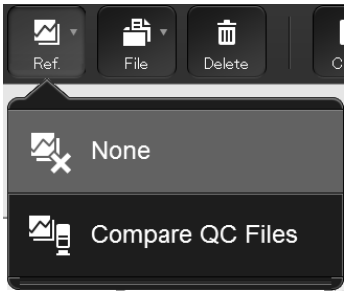
- To cancel select range mode, press the [Range] button on the toolbar again.
- When the QC charts are hidden, the range-selecting mode is automatically cancelled.

8.5.6 Compare QC Files

QC charts registered to the same analyzer are overlaid on top of each other for comparison. Compares the new lot with the current lot.
X-barM data cannot be compared with other data.
Follow the steps below to compare QC files.

1 In the [QC Chart] screen, click the [Ref.] button on the toolbar.

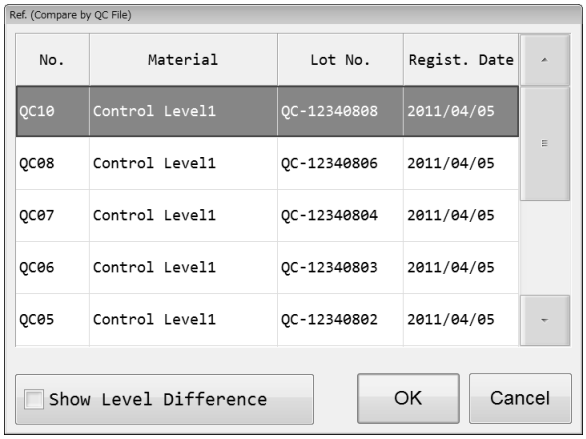
The submenu on the right appears.



2 Click [Compare QC Files].

The dialog box on the right appears.

[Show Level Difference]	
Not selected	Only files with the same material and same level as the main chart are shown in the dialog box.
Selected	All files with the same material as the main chart are shown in the dialog box.



3 Select the QC files you want to overlay, and then click [OK].

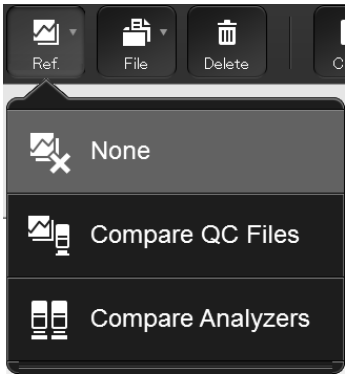
The selected QC files are compared and displayed.
Only one QC file can be superimposed.

8.5.7 Compare Analyzers

Compares QC files for the same material but registered to other analyzers.
Follow the steps below to compare analyzers.

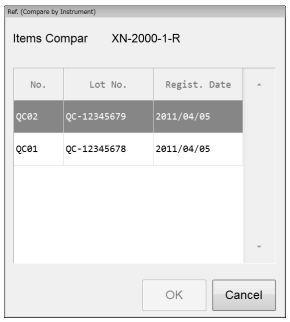
1 In the [QC Chart] screen, click the [Ref.] button on the toolbar.

The submenu on the right appears.

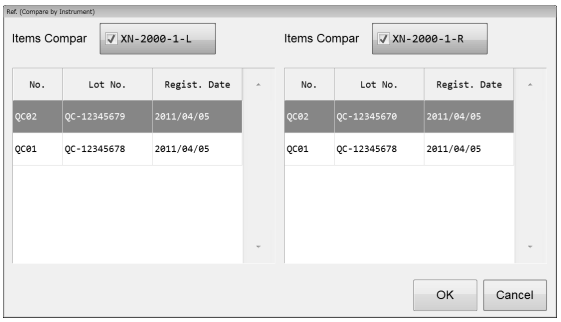


2 Click [Compare Analyzers].

The following dialog box appears.



When two analyzers are connected



When three analyzers are connected

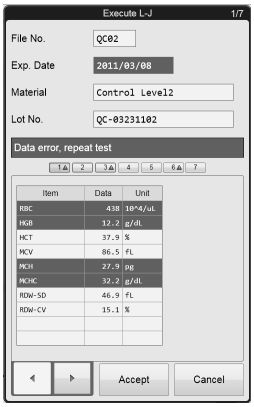
3 Select the check boxes for the analyzers you want to overlay, and click [OK].

The selected analyzers are compared and displayed.

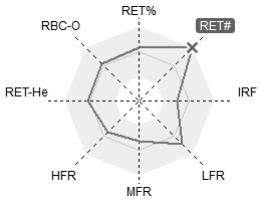
8.6 Troubleshoot quality control errors

This section explains how to troubleshoot errors that occur during quality control analysis.

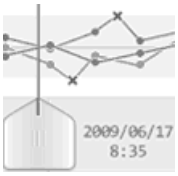
- **If a data exceeds the QC limit, and is highlighted in red, check the analysis data in the Data Browser screen.**



- **Check parameters which have recorded errors on the radar chart.**



- **Check detailed data from the line graph.**



Note:

When performing manual QC analysis, if you click the [Cancel] button on the analysis screen, the data will not be plotted to the QC file.

8.7 Manage QC files

This section explains how to manage QC files.
Follow the steps below to modify, delete, save and restore QC files.

1 Click the [QC File] icon menu.

The [QC File] screen appears.

2 Select the QC file you want to manage.

Modify

Click the [Modify] button on the toolbar to display the [Input Lot Information] dialog box.
The displayed controls and fields are the same as when manually registering a new QC file.
(➤**P.8-4** "8.3 Registering and modifying a QC file (lot information input)")

Delete

Click the [Delete] button on the toolbar to delete the selected file.

Save QC file data

Click the [File] button - [Backup] on the toolbar to display the dialog box for confirming the file name and save directory.

Note:

The following file is saved.
[Analyzer ID][Software version][QCFile][Date of save_Time of save][Material][Lot No.].qcf

Restoring saved data

Click the [File] button - [Restore] on the toolbar to display the dialog box for specifying the file to read.

Chapter 9 Analyzing samples

This chapter explains the preparation of analysis samples and the different analysis modes.

⚠ Caution!

- Please ensure that samples are mixed sufficiently before being placed on the analyzer. This is especially important for samples from patients prone to high degrees of sedimentation or for samples that have been refrigerated/transported in a cool environment.
- The instrument is equipped with a Blood Aspiration Sensor. However, there is a possibility that correct results may not be obtained if the sample volume is lower than that stated in the Instructions for Use.
- During analysis, do not turn OFF the main power switch of the instrument. Risk of corrupting the information that is written to the reagent cartridge.

9.1 Types of analysis

This instrument supports the following analysis mode.

Manual analysis

In this analysis, the operator loads the sample tubes individually by hand. The operator also mixes the samples by hand. Use this analysis for STAT sample analysis, or for analyzing special samples.

Micro analysis

This is a type of manual analysis. The analysis is performed without a cap on the sample tube, to reduce dead volume. The conditions for micro analysis are as follows:

- When [Cap Open] is turned ON in the Manual Analysis menu
- When an analysis is performed in [Pre-Dilution] mode
- When a micro collection tube is used

RBT analysis

This is a type of manual analysis. The analysis is performed using Raised Bottom Tubes, to reduce dead volume.

Body fluid analysis*1

This is a type of manual analysis. Use this analysis to measure body fluid.

HPC analysis*1

This is a type of manual analysis. Use this for the analysis of HPC-related parameters.

hsA analysis*1,2

This is a type of manual analysis. Use this for the analysis of low-concentration blood cell samples for research.

*1 The availability of these functions depends on your system configuration.

*2 For information on hsA analysis, see the "Administrator's Guide".
(➤Administrator's Guide, "Chapter 3: 3.3 hsA analysis")

⚠ Caution!

In manual analysis, Raised Bottom Tubes can only be used for RBT analysis. Risk of instrument failure.

System analysis (sampler analysis)

In this analysis, the operator loads the sample tubes into a rack, which is then automatically transported and analyzed by the instrument.
The maximum number of samples you can load at a time depends on the device configuration.
To use Raised Bottom Tubes in system analysis (sampler analysis), place the tubes in a rack for Raised Bottom Tubes (RBT rack).

Off-line analysis (sampler analysis)

In this analysis, the operator separates an analyzer from the system's transport line, in order to perform a separate analysis of a rack. Use this analysis for samples of greater urgency.

Caution!

In off-line analysis (sampler analysis), Raised Bottom Tubes and RBT racks cannot be used.
Risk of instrument failure.

Note:

Except when performing micro analysis, use the sample tube with the cap on.

9.1.1 Analysis modes

In this instrument, you can select the analysis mode according to the different samples.
The following are characteristics of each analysis mode:

Analysis mode	Description	Remarks
[Whole blood] mode 	Used for analyzing whole blood.	• Anticoagulant added • Manual analysis/Sampler analysis • This mode is automatically selected when performing a System analysis/Off-line analysis (sampler analysis).
[Low WBC] mode 	Used for analyzing low WBC using whole blood. The count time of the WDF channel is set to 3 times that of [Whole blood] mode to increase white blood cell measurement accuracy.	• Anticoagulant added • Manual analysis • Sampler analysis (only for retesting and querying host)
[Pre-Dilution] mode 	Used for analyzing a minute amount of blood collected from the earlobe or fingertip.	• 1:7 dilution • Manual analysis (micro analysis) only • Blood aspiration sensor not used
[Body Fluid] mode* 	Used for analyzing body fluid (cerebrospinal fluid, serous (peritoneal and pleural), synovial fluid, CAPD (Continuous ambulatory peritoneal dialysis) fluid).	• Manual analysis only • Blood aspiration sensor not used
[HPC] mode* 	Used for the analysis of HPC-related parameters using whole blood.	• Anticoagulant added • Manual analysis only • Blood aspiration sensor not used
[hsA] mode* 	Used for the analysis of parameters of low-concentration blood cells for research.	• Manual analysis only • Blood aspiration sensor not used

* The availability of these functions depends on your system configuration.

Information

The parameters in the hsA analysis results are for research purpose only.
Do not use the analysis results of these parameters for the diagnosis of patients.

9.2 Prepare the sample

This section will explain how to prepare the sample for analysis.

9.2.1 Sample types and handling

Samples analyzed in each analysis mode are as follows:

- [Whole blood]/[Low WBC]/[HPC] mode: Whole blood
- [Pre-Dilution] mode: Diluted blood such as capillary blood that has been diluted
- [Body Fluid] mode: Body fluid (cerebrospinal fluid, serous (peritoneal and pleural), synovial fluid, CAPD (Continuous ambulatory peritoneal dialysis) fluid)

Handling whole blood

Collect venous blood with anticoagulant (EDTA-2K, EDTA-3K, or EDTA-2Na). Draw the specified amount of blood as per the package insert of the tube used.

The sample should be analyzed within 4 hours after collection. If it is not possible to analyze the sample within 4 hours, store it in a refrigerator at 2 to 8°C until it can be analyzed. When analyzing a refrigerated sample, take it out of the refrigerator at least 15 minutes prior to analysis, to bring it back to room temperature. Once restored to room temperature, mix the blood sufficiently before performing analysis.

⚠ Caution!

- Please ensure that samples are mixed sufficiently before being placed on the analyzer. Any delay in processing after mixing may lead to the production of incorrect results.
  This is especially important for samples from patients prone to high degrees of sedimentation or for samples that have been refrigerated/transported in a cool environment.
- If analyzing in [HPC] mode, mix the sample gently and analyze promptly.
  Mixing with excessive force may cause cellular degradation and or activation of the sample and should be avoided.
- Use only the specified anticoagulant.
  Using a non-specified anticoagulant may result in hemolysis or platelet aggregation, preventing correct analysis results.
- Please ensure that sample tubes are filled and used in accordance with the manufacturer's package insert.
  If a sample tube is filled in excess of the specified volume, accurate analysis cannot be guaranteed.
  Over filling can lead to insufficient mixing or inadequate sample anticoagulation.
  Sample tubes are designed such that the normal filling allows an air gap at the top of the tube. This air gap is crucial to mixing as without this the blood does not move when the tube is inverted.

Handling diluted blood

For diluted blood, dilute capillary or venous blood by a factor of 7. In the case of capillary blood, dilute by a factor of 7 after collection by dispensing the blood directly into the diluent. Do not use any anticoagulants. Alternatively, you can collect the blood in a micro collection tube, and dilute it later.

e.g.

1 Pour CELLPACK DCL into the diluent-dispensing container.
2 Dispense 120 µL of CELLPACK DCL into the micro collection tube.
3 Add 20 µL blood to the micro collection tube containing 120 µL CELLPACK DCL (dilution ration 1:7).
4 Cap the sample, mix well and analyze

⚠ Caution!

- The sample should be analyzed immediately after dilution, as platelet aggregation can easily occur in diluted samples.
  In addition, the dispensed diluent can cause a margin of error in the analysis data due to evaporation or contamination.
  Therefore, a new diluted blood sample should be prepared for each analysis.
- After diluting the sample, mix gently and analyze promptly. If the sample is mixed excessively after dilution, the results may not be accurate.
- It is OK to apply light pressure to collect the capillary blood sample. However, too much pressure will squeeze out body fluid with the blood, which lowers the reliability of the analysis results.

Handling body fluids

Upon the collection of body fluid, add an anticoagulant such as EDTA or heparin as needed.
Analyze as soon as possible after collecting the sample. Particularly in the case of cerebrospinal fluid (CSF), it has been indicated that cell breakdown starts to occur within one hour after collection*.

* CLSI H56-A: Clinical and Laboratory Standards Institute H56-A

⚠ Caution!

Excessive mixing of a body fluid sample may cause false WBC-BF and TC-BF# values.
Mix as gently as possible.

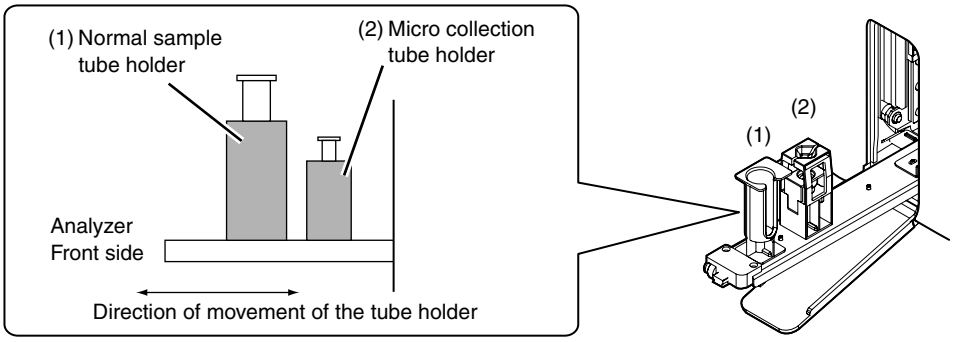
Sample volume

This section explains the required sample volume.

Type of analysis	Specimen	Tube type	Sample Setting Position	Manual Analysis Menu [Cap Open]	Aspirated sample volume	Required sample volume
Sampler analysis	Whole blood	Closed tube	Sampler rack	-	88 µL	1 mL
		Raised Bottom Tube (closed)	RBT rack	-		250 µL
Manual analysis	Whole blood	Closed tube	Normal tube holder	OFF	88 µL	1 mL
		Open tube		ON		300 µL
		Open micro tube	Micro tube holder	-		160 µL
		Raised Bottom Tube (closed)	Normal tube holder	OFF		250 µL
	Diluted blood	Open tube	Normal tube holder	ON	70 µL	300 µL
		Open micro tube	Micro tube holder	-		140 µL
	Body fluid*1	Closed tube	Normal tube holder	OFF	88 µL	1 mL
		Open tube		ON		300 µL
		Open micro tube	Micro tube holder	-		160 µL
	Whole blood (HPC)*2	Closed tube	Normal tube holder	OFF	190 µL	1 mL
		Open tube		ON		400 µL
		Open micro tube	Micro tube holder	-		260 µL

*1 The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.

*2 HPC analysis can only be performed if the instrument offers the HPC analysis mode.



9.3 Manual analysis

This section explains how to analyze whole blood and diluted blood in manual analysis. The method for analyzing a STAT sample is the same as the method for manual analysis.

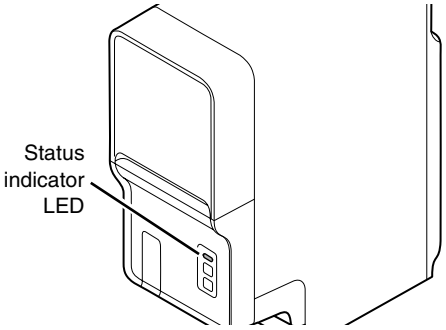
⚠ Caution!

- Samples measured in the manual mode are not mixed by the instrument and therefore must be mixed manually.
- A Raised Bottom Tube cannot be used in [Pre-Dilution] mode.

Follow the steps below to perform manual mode analysis.

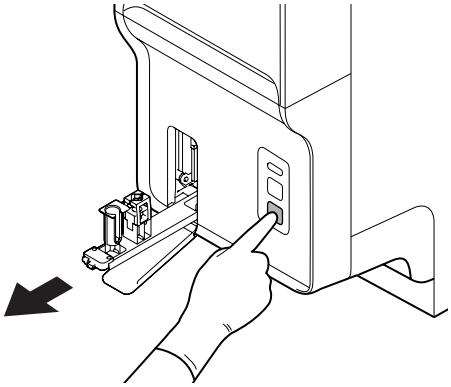
1 Check the Status indicator LED on the analyzer.

If the Status indicator LED is not lit green, wait until it does.
This step is not necessary when analyzing a STAT sample.
Proceed to the next step.



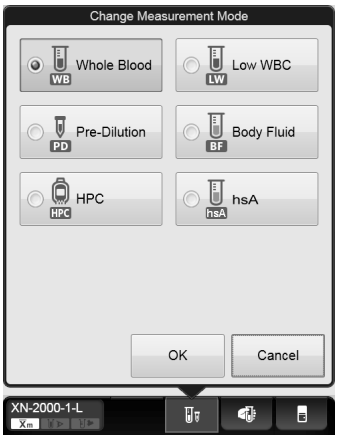
2 If the tube holder has not ejected out, press the mode switch.

The tube holder slides out forward.



3 Click the Change Analysis Mode button on the control menu.

The dialog box on the right appears.



● **Specifying the analysis mode**

[Whole blood]	Select this when using whole blood as the sample.
[Low WBC]	Select this to perform low WBC analysis when using the whole blood as the sample.
[Pre-Dilution]*	Select this when using 1:7 diluted blood as the sample.

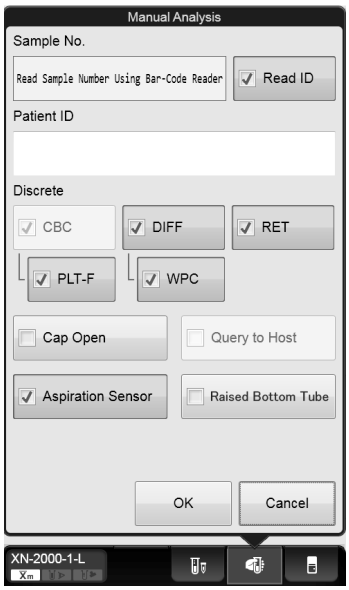
* When changing to [Pre-Dilution] from a different mode, the switching will takes some time. Please wait a while.

4 Click [OK].

The dialog box closes.

5 Click on the Manual Analysis button on the control menu.

A dialog box corresponding to the selected mode appears.



● **In [Whole blood] mode / [Low WBC] mode:**

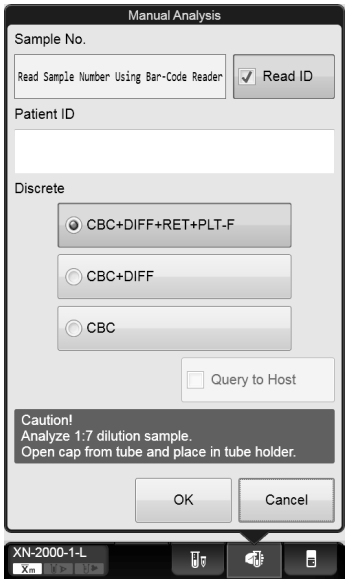
[Sample No.]*	Input is not necessary if the [Read ID] checkbox is selected. If you will not scan a barcode, enter the sample number manually in the input field.
[Read ID]	Select this checkbox if barcode labels on sample tubes will be scanned using the analyzer's built-in barcode reader. This cannot be selected if sample tube barcode reading is not enabled in the analyzer settings.
[Patient ID]	Enter the patient ID in the input field.
[Discrete]	Select the check marks for the discrete tests you want performed. In [Low WBC] mode, [DIFF] cannot be changed.
[Cap Open]	Select the check mark to perform a micro blood analysis. This enables you to analyze the sample without a cap on the sample tube, to minimize dead volume.
[Query to Host]	This only appears if real-time query is set to ON in the analyzer settings. Select this checkbox to query the host for analysis information. This cannot be selected when the [Read ID] checkbox is selected.
[Aspiration Sensor]	Enables/disables the Blood Aspiration Sensor.
[Raised Bottom Tube]	Select the check mark to perform RBT analysis. This enables you to analyze the sample by using a Raised Bottom Tube, to minimize dead volume. This enables you to analyze the sample with the cap on the sample tube.

* You can also use the hand-held barcode reader to input the sample number.

● **In [Pre-Dilution] mode:**

[Cap Open], [Aspiration Sensor] and [Raised Bottom Tube] are not displayed.

In addition, the discrete tests are different. Other settings are the same as the [Whole blood] mode.



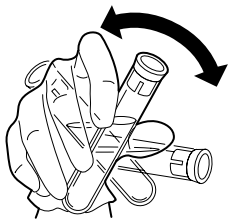
Note:

- The instrument is equipped with a Blood Aspiration Sensor. However, there is a possibility that correct results may not be obtained if the sample volume is low and the sensor could not detect a "Short Sample" or "Sample Not Asp Error".
- If you know in advance that the blood sample has a very low hemoglobin (e.g. blood from a dialysis patient), disable the Blood Aspiration Sensor.
  (➤Administrator's Guide, "Chapter 4: 4.2.9 Analyzer settings")

6 Click [OK].

The dialog box closes.

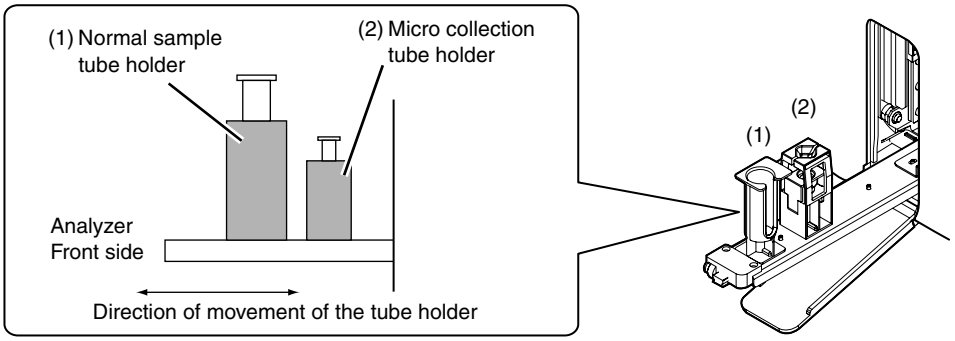
7 Mix the sample tube as shown.



e.g. Normal sample tube

8 Place the sample tube in the tube holder.

There are 2 sample tube holders.
When inserting a micro collection tube, insert the tube all the way in so that the bottom of the tube contacts the base of the holder.



● **When performing micro analysis**

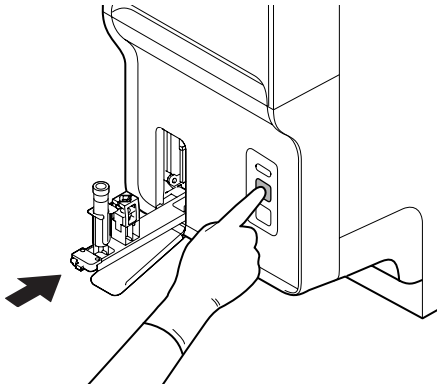
Place the sample tubes after removing the cap.
When removing the cap, use caution to prevent the sample from splattering.

● **When performing RBT analysis**

Place the Raised Bottom Tube in the normal sample tube holder.

9 Press the start switch on the analyzer.

The tube holder slides in, and the aspiration of the sample begins.
Once the analysis finishes, the tube holder slides out.



e.g. When a normal tube is set

10 Remove the sample.

To analyze another sample, repeat steps 3 through 10.

11 Press the mode switch on the analyzer.

The tube holder slides into the analyzer.
For the details on checking the analysis results, see Chapter 10. (➤**P.10-1** "Chapter 10: 10.1 Sample Explorer functions")

Information

If a message appears during analysis to ask for reagent replacement, replace the reagent concerned. If the reagent is replaced when the reagent level is low, bubbling could occur, which would raise the blank value.

9.4 Body fluid analysis

This section explains samples and analysis items for body fluid analysis.

* The availability of this function depends on your system configuration.

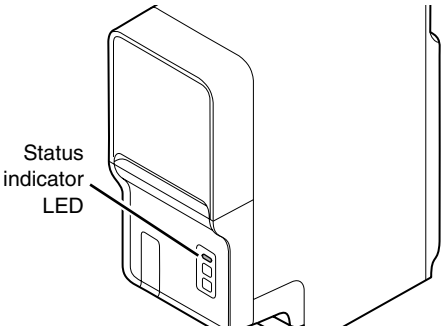
⚠ Caution!

A Raised Bottom Tube cannot be used for body fluid analysis.

Follow the steps below to perform body fluid analysis.

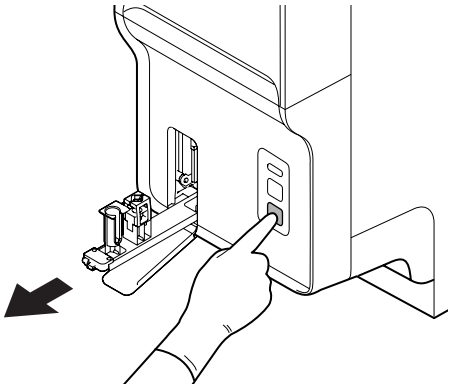
1 Check the Status indicator LED on the analyzer.

If the Status indicator LED is not lit green, wait until it does.



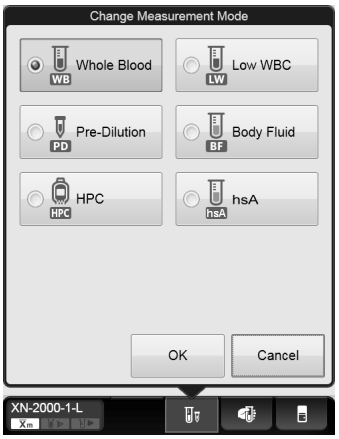
2 If the tube holder has not ejected out, press the mode switch.

The tube holder slides out forward.



3 Click the Change Analysis Mode button on the control menu.

The dialog box on the right appears.



4 Click [Body Fluid].

5 Click [OK].

The instrument will automatically perform a background check after body fluid analysis is accessed.
If the background values that result from the background check are under the allowable values, the Status indicator LED lights green and the analyzer enters the body fluid analysis preparation done state.

Checked Parameter	Acceptable Value	Explanation
WBC-BF	0.001 x 10^3/µL or less	White blood cell count in body fluid obtained from the WDF channel.
RBC-BF	0.003 x 10^6/µL or less	Red blood cell count in body fluid obtained from the RBC/PLT channel.

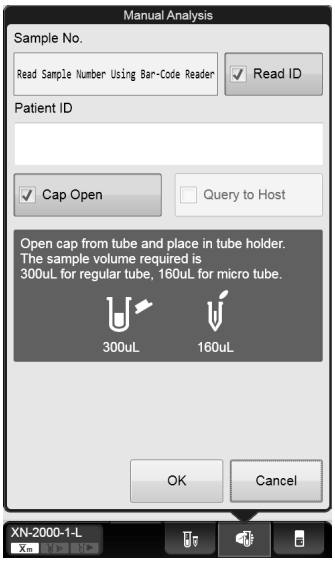
For information on background check, see Chapter 6.
(➤**P.6-20** "Chapter 6: 6.4.5 Execution of analyzer self-check")

6 Click on the Manual Analysis button on the control menu.

A dialog box corresponding to the selected mode appears.

[Sample No.]*	Input is not necessary if the [Read ID] checkbox is selected. If you will not scan a barcode, enter the sample number manually in the input field.
[Read ID]	Select this checkbox if barcode labels on sample tubes will be scanned using the analyzer's built-in barcode reader. This cannot be selected if sample tube barcode reading is not enabled in the analyzer settings.
[Patient ID]	Enter the patient ID in the input field.
[Cap Open]	Select the check mark to perform a micro blood analysis. This enables you to analyze the sample without a cap on the sample tube, to minimize dead volume.
[Query to Host]	This only appears if real-time query is set to ON in the analyzer settings. Select this checkbox to query the host for analysis information. This cannot be selected when the [Read ID] checkbox is selected.

* You can also use the hand-held barcode reader to input the sample number.

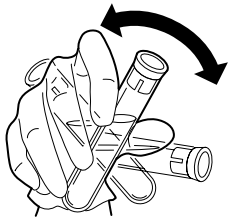


> **Note:**
> Immediately after the analysis type is changed to [Body Fluid], [Cap Open] is in the selected state. If you will perform closed analysis using regular sample tubes, remove the [Cap Open] checkmark.

7 Click [OK].

The dialog box closes.

8 Mix the sample tube as shown.

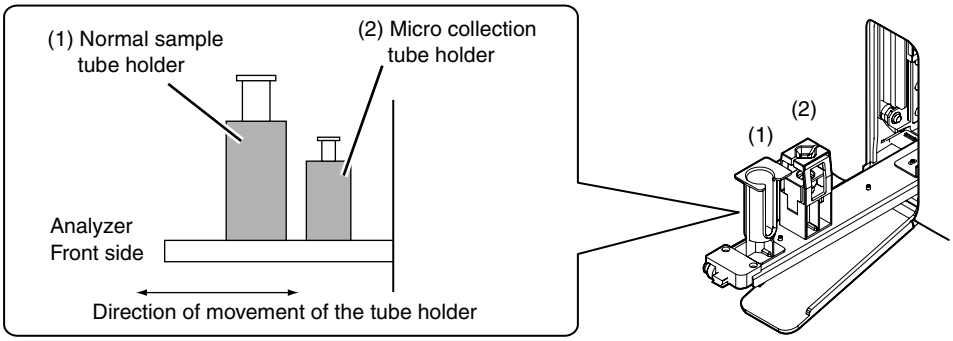


e.g. Normal sample tube

9 Place the sample tube in the tube holder.

There are 2 sample tube holders.

When inserting a micro collection tube, insert the tube all the way in so that the bottom of the tube contacts the base of the holder.



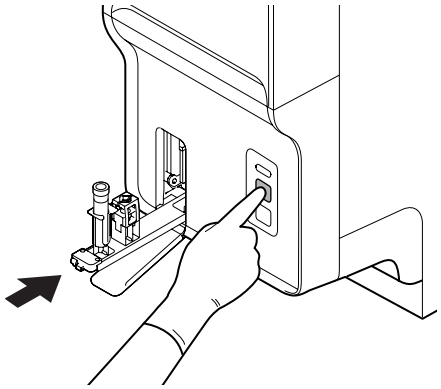
● **When performing micro analysis**

Place the sample tubes after removing the cap.

When removing the cap, use caution to prevent the sample from splattering.

10 Press the start switch on the analyzer.

The tube holder slides in, and the aspiration of the sample begins.
Once the analysis finishes, the tube holder slides out.



e.g. When a normal tube is set

11 Remove the sample.

To analyze another sample, repeat steps 3 through 10.

12 Press the mode switch.

The tube holder slides into the analyzer.
For the details on checking the analysis results, see Chapter 10. (➤**P.10-1** "Chapter 10: 10.1 Sample Explorer functions")

Information

If a message appears during analysis to ask for reagent replacement, replace the reagent concerned. If the reagent is replaced when the reagent level is low, bubbling could occur, which would raise the blank value.

9.5 HPC analysis

This section explains the procedure for performing HPC analysis.

* The availability of this function depends on your system configuration.

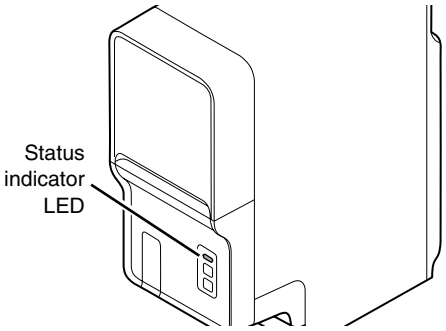
Caution!

A Raised Bottom Tube cannot be used for HPC analysis.

Follow the steps below to perform HPC analysis.

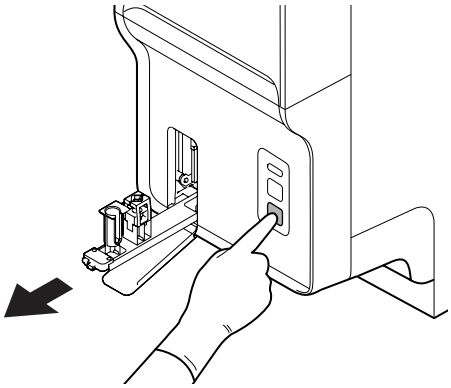
1 Check the Status indicator LED on the analyzer.

If the Status indicator LED is not lit green, wait until it does.



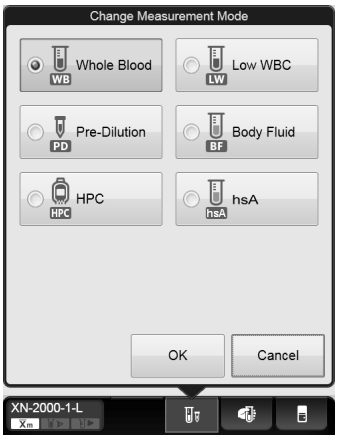
2 If the tube holder has not ejected out, press the mode switch.

The tube holder slides out forward.



3 Click the Change Analysis Mode button on the control menu.

The dialog box on the right appears.



4 Click [HPC].

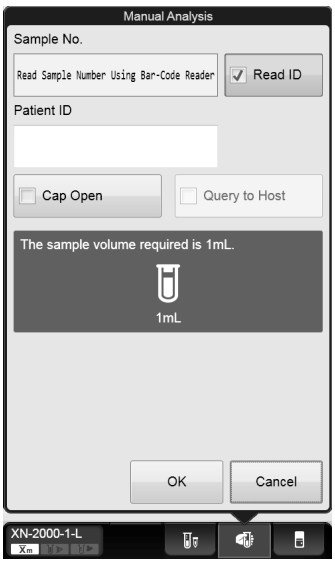
5 Click [OK].

6 Click on the Manual Analysis button on the control menu.

A dialog box corresponding to the selected mode appears.

[Sample No.]*	Input is not necessary if the [Read ID] checkbox is selected. If you will not scan a barcode, enter the sample number manually in the input field.
[Read ID]	Select this checkbox if barcode labels on sample tubes will be scanned using the analyzer's built-in barcode reader. This cannot be selected if sample tube barcode reading is not enabled in the analyzer settings.
[Patient ID]	Enter the patient ID in the input field.
[Cap Open]	Select the check mark to perform a micro blood analysis. This enables you to analyze the sample without a cap on the sample tube, to minimize dead volume.
[Query to Host]	This only appears if real-time query is set to ON in the analyzer settings. Select this checkbox to query the host for analysis information. This cannot be selected when the [Read ID] checkbox is selected.

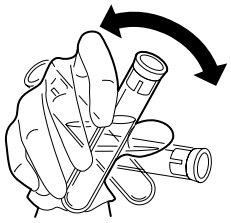
* You can also use the hand-held barcode reader to input the sample number.



7 Click [OK].

The dialog box closes.

8 Mix the sample tube as shown.

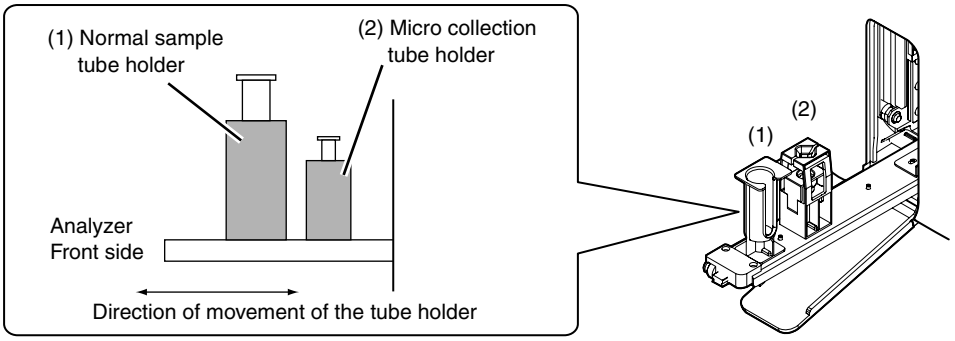


e.g. Normal sample tube

9 Place the sample tube in the tube holder.

There are 2 sample tube holders.

When inserting a micro collection tube, insert the tube all the way in so that the bottom of the tube contacts the base of the holder.



● **When performing micro analysis**

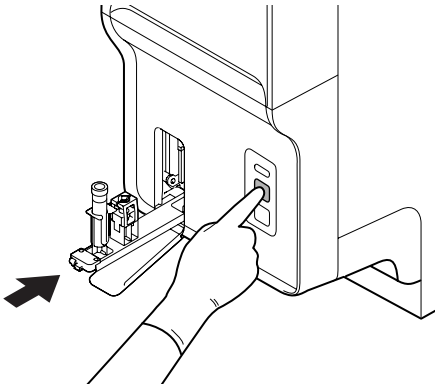
Place the sample tubes after removing the cap.

When removing the cap, use caution to prevent the sample from splattering.

10 Press the start switch on the analyzer.

The tube holder slides in, and the aspiration of the sample begins.

Once the analysis finishes, the tube holder slides out.



e.g. When a normal tube is set

11 Remove the sample.

To analyze another sample, repeat steps 3 through 10.

12 Press the mode switch.

The tube holder slides into the analyzer.

For the details on checking the analysis results, see Chapter 10. (➤**P.10-1** "Chapter 10: 10.1 Sample Explorer functions")

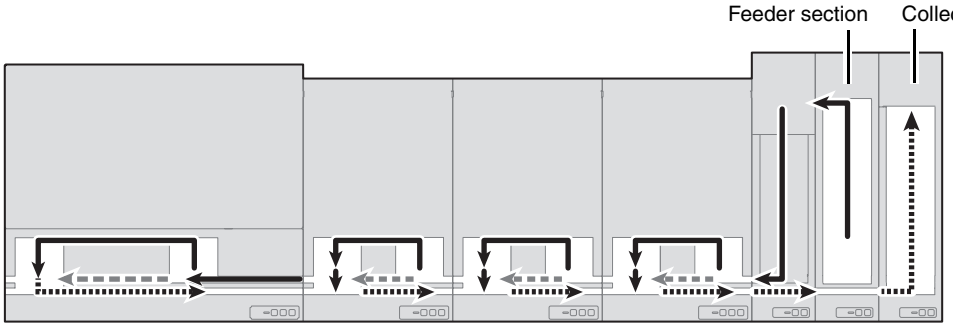
Information

If a message appears during analysis to ask for reagent replacement, replace the reagent concerned. If the reagent is replaced when the reagent level is low, bubbling could occur, which would raise the blank value.

9.6 System rack flow

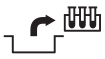
This instrument consists of multiple transportation units, and you can add to the configuration or modify it. Here, we will use some typical configurations to illustrate the overall flow of transport.

XN-9000 basic configuration



The labels below are attached to the feeder and collection sections.


Feeder section


Collection section

Analysis line: The racks are transported to this line to be analyzed by each analyzer.

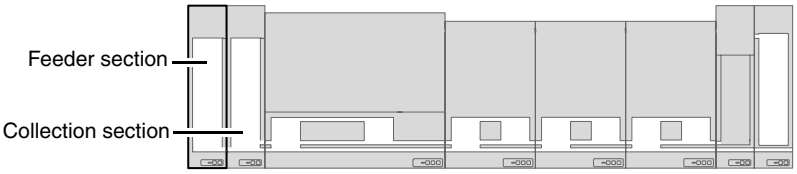
Bypass line: If a rack is assigned to a certain analyzer (e.g. during the sort process), the rack is transported on this line to bypass the unassigned analyzers.

Collection line: This line transports the finished racks to the collection section.

Note:

The locations of the feeder section and collection section vary depending on the instrument combination. Take care not to place a rack in the wrong position.

e.g. 1. A configuration with the feeder and collection sections on the left side.



e.g. 2. A configuration with the feeder section on the right side and the collection section on the left side.

9.7 Performing a system analysis (sampler analysis)

⚠ Caution!

- Correct analysis results may not be obtained due to insufficient mixing if the sample is left for more than 4 hours and the cells/plasma have separated.
  Therefore, in case of analyzing such samples, make sure to mix the samples thoroughly before setting them on the sampler.
- Please ensure that sample tubes are filled and used in accordance with the manufacturer's package insert.
  If a sample tube is filled in excess of the specified volume, accurate analysis cannot be guaranteed. Over filling can lead to insufficient mixing or inadequate sample anticoagulation.
- Sample tubes are designed such that the normal filling allows an air gap at the top of the tube. This air gap is crucial to mixing as without this the blood does not move when the tube is inverted.

Follow the steps below to perform a system analysis (sampler analysis).

1 Check the status of the transportation units.

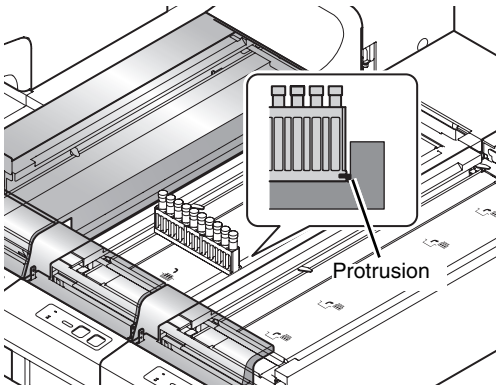
In the [Status] screen of the transportation controller, make sure that there are no transportation units that are unconnected (gray) or in an error state (red) .

2 Verify that the start yard (ST) is in READY state.

If the Status indicator LED is not lit green, wait until it does.

3 Rack loading

Load sample racks into the feeder section of the Start yard (ST). Verify that rack is properly seated in the feeder; the groove on the bottom of the rack should fit into the guide in the feeder section. See figure on the right.
The system will recognize the rack and automatically proceed to transport to the next module. Rack process can be stopped by pressing the Start/Stop switch on the feeder section of ST.



Caution!

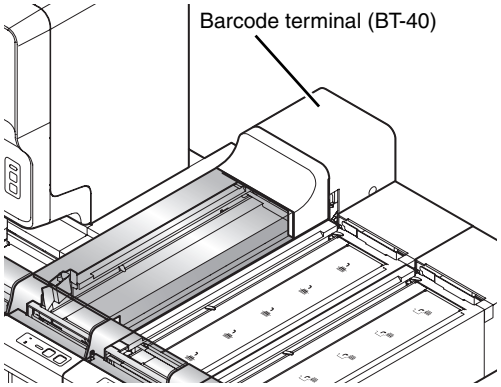
- If it is necessary to use a Raised Bottom Tube, insert the tube in the RBT rack, please note the following.
  - Do not insert a Raised Bottom Tube in anything other than a RBT rack.
  - Do not insert a sample tube other than a Raised Bottom Tube in a RBT rack.
- Do not remove a rack in transit.
  If you remove any rack in transit, the analysis may not run correctly.
- Do not insert a rack or sample in anything other than the feeder when analysis is in progress.
  There is a risk of incorrect sample analysis if this is done.
  If there is an STAT sample that needs to be analyzed, perform a manual analysis or an off-line analysis (sampler analysis).
  (➤**P.9-7** "9.3 Manual analysis")
  (➤**P.9-22** "9.8 Performing off-line analysis (sampler analysis)")

Note:

Raised Bottom Tubes cannot be used on the SP-10. Analysis of a sample placed in a RBT rack will not take place even if an order is received from the host computer.

4 The barcode terminal (BT-40) reads the barcode label.

It queries the host computer for the sample number to verify the analysis order.

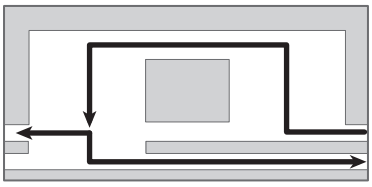


5 The rack is transported to the appropriate analyzer.

Racks will be automatically transported to the hematology analyzers on the system. When there are multiple analyzers, the system will manage the workload and use systems equally, based on the test requests on the tubes and available test menu on the analyzers.

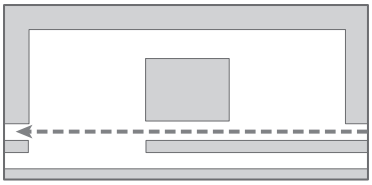
- **Rack flows through the analyzers or device as shown in the diagram on the right:**

The rack moves to the analysis line, and is analyzed by the analyzer.



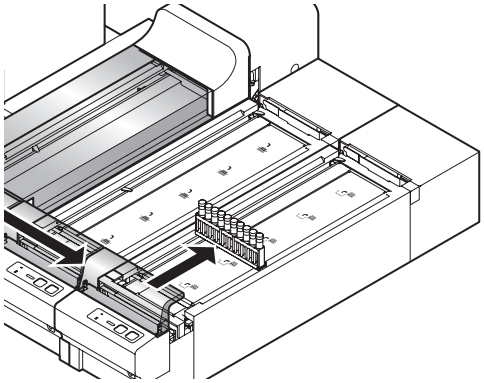
- **If Rack is not assigned to the analyzer or device, then it will by-pass the module, as shown in the diagram on the right:**

The rack travels through the bypass line.



6 The rack is pooled in the stock yard (ST).

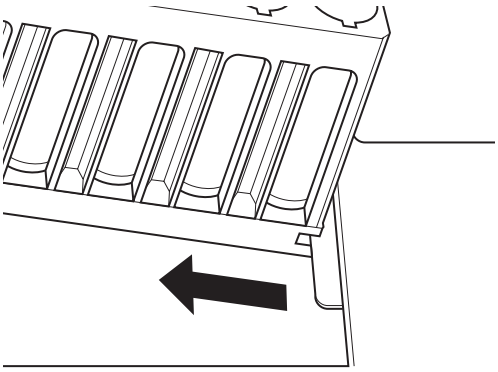
Racks, containing completed samples will travel and pool at the collection line stock yard (ST).



7 Remove the rack after the analysis is finished.

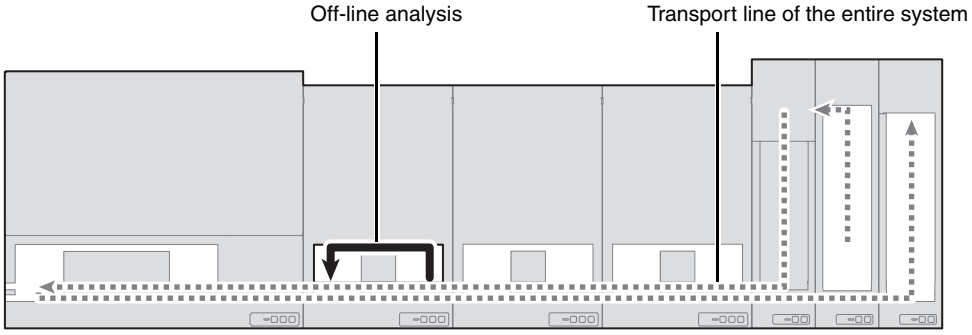
Lift rack at a slight angle to release the groove from the guide on the collection line.

For the details on checking the analysis results, see Chapter 10. (➤**P.10-1** "Chapter 10: 10.1 Sample Explorer functions")



9.8 Performing off-line analysis (sampler analysis)

Not a routine mode of analysis. Off-line analysis mode is when a module (CVR) is setup so that racks will not automatically enter for analysis or processing. Samples can be analyzed or processed through these modules, if they are directly introduced by operator. And once processing is completed, rack is manually removed from the CVR. During this mode of operation, the rest of the analyzers or devices on the XN-9000 will continue to process samples and racks in automated fashion.



e.g. Transport line when off-line analysis (sampler analysis) is performed on CV-50.

Caution!

- Correct analysis results may not be obtained due to insufficient mixing if the sample is left for more than 4 hours and the cells/plasma have separated.
  Therefore, in case of analyzing such samples, make sure to mix the samples thoroughly before setting them on the sampler.
- Please ensure that sample tubes are filled and used in accordance with the manufacturer's package insert.
  If a sample tube is filled in excess of the specified volume, accurate analysis cannot be guaranteed. Over filling can lead to insufficient mixing or inadequate sample anticoagulation.
- Sample tubes are designed such that the normal filling allows an air gap at the top of the tube. This air gap is crucial to mixing as without this the blood does not move when the tube is inverted.

Follow the steps below to perform off-line analysis (sampler analysis).

1 Press the mode switch on the conveyor (CV-50/CV-60).

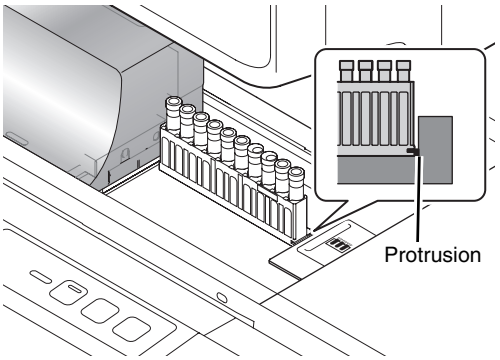
(➤**P.4-13** "Chapter 4: 4.4.4 XN conveyor (CV-50)")

2 Verify that the conveyor (CV-50/CV-60) is in READY state.

If you press the mode switch while system analysis is in progress, the switching of modes takes place after all the racks on the conveyor have completed analysis and have been discharged.
During the transition state from system analysis mode to off-line analysis mode, the analysis mode indicator LED of the conveyor (CV-50/CV-60) flashes in orange. Please wait until all the racks on the conveyor have been discharged, and the LED is lit in orange.

3 Place the rack on the right pool of the conveyor (CV-50/CV-60).

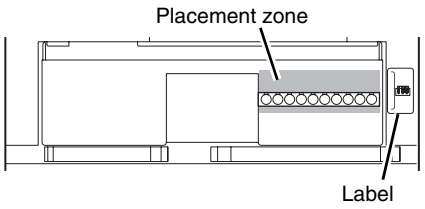
Slide the groove on the rack into the protrusion on the right side (when you face the analyzer). Once the rack is set, the transport of the rack begins automatically. A maximum of 2 racks can be placed at a time.



e.g. Setting the racks on CV-50

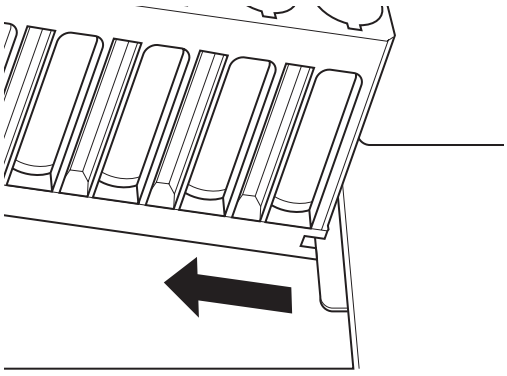
⚠ Caution!

- In off-line analysis (sampler analysis), Raised Bottom Tubes and RBT racks cannot be used. Risk of instrument failure.
- Refer to the label on the right conveyor pool, and place the rack inside the placement zone. If you place it outside the zone, the rack transport will not start. Correct operation is not guaranteed if the racks are set diagonally.



4 Remove the rack after the analysis is finished.

After the analysis has finished, the rack is discharged to the left conveyor pool, and the rack position indicator LED turns ON. When removing the rack, check that the protrusion has cleared the groove, and then remove the rack.
Up to 3 finished racks can be stored. Once 3 racks have been placed, an alarm will sound to notify a full state.
For the details on checking the analysis results, see Chapter 10.
(➤**P.10-1** "Chapter 10: 10.1 Sample Explorer functions")



5 Press the mode switch on the conveyor (CV-50/CV-60).

The analysis mode indicator lights green, and the mode switches to system analysis.

Note:

If there is any rack left on the conveyor, you cannot switch to system analysis. Check that all racks have completed analysis, and have been removed from the left conveyor pool.

9.9 Preparing a smear sample in manual mode (SP-10)

Follow the steps below to perform manual analysis with SP-10.

1 Prepare for analysis by SP-10.

For details, see the Instructions for Use for SP-10.
(➤SP-10 Instructions for Use, "Chapter 6: 6.3 Manual Smear Preparation")

2 Touch [Conv.int.] in SP-10's main menu screen.

Note:
If the power to the transportation units is OFF, the step for interrupting the transport is not necessary. Carry out the operations in steps 5 through 10.

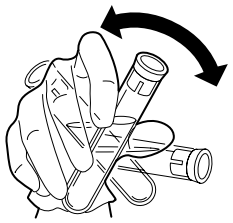
3 Touch [Interrupt].

4 Touch [Return].

5 Touch [Manual] in main menu screen.

The Manual screen on the right appears. Enter the necessary information.

6 Mix the sample tube as shown.



e.g. Normal sample tube

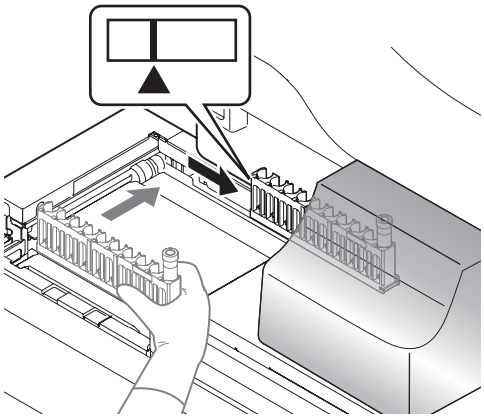
Caution!
Raised Bottom Tubes cannot be used on the SP-10. Risk of instrument failure.

7 Set the sample in the SP conveyor (CV-60).

To set the sample in [Closed] mode:

1 Insert the sample tube you want analyzed into the 10th position of the rack.

2 Set the rack so that its left end fits the label shown on the right.



To set the sample in [Micro] or [Stain] mode:

See Chapter 6 of the SP-10 Instructions for Use.

(➤SP-10 Instructions for Use, "Chapter 6: 6.3.3 Starting a smear sample preparation")

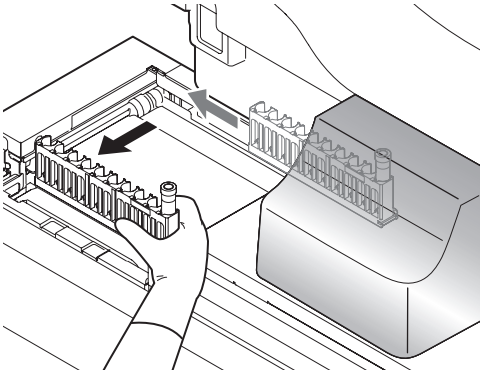
8 Touch [Start] in the manual screen.

The analysis of the sample begins.

Wait until the preparation of the smear sample finishes and the sample tube is returned to the rack.

9 Remove the rack.

Slide the rack to left on analysis line, and then remove it.



10 Touch [Return] in the manual screen.

11 Touch [Conv.int.] in the main menu screen.

12 Touch [Stop int.].

Chapter 10 Checking analysis data (Sample Explorer)

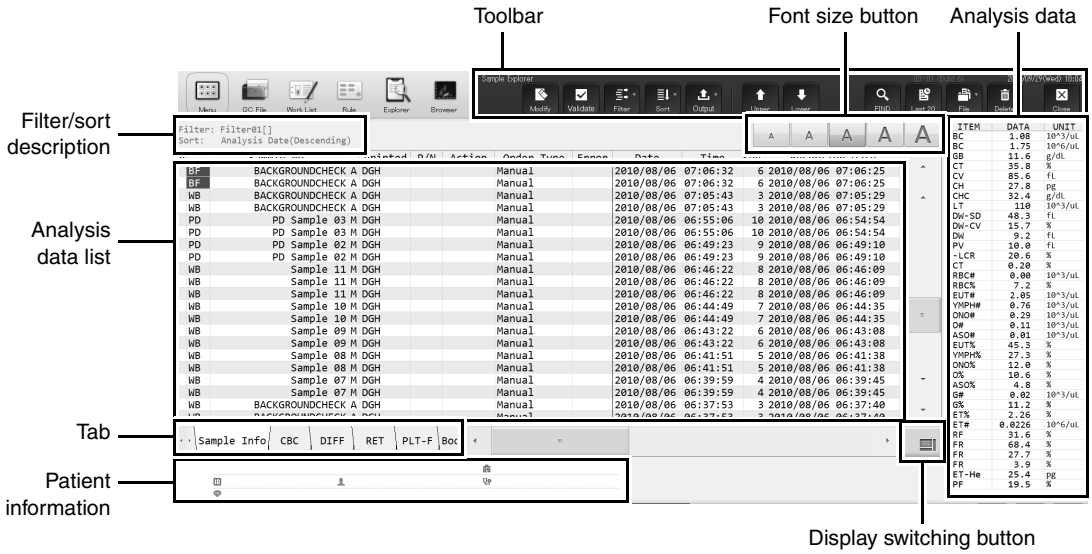
This section explains how to check the analysis data.

10.1 Sample Explorer functions

The Sample Explorer's functions allow you to display, delete, validate, and output analysis data that are saved on the IPU. You can display the analysis data for up to 100,000 samples. In addition, you can sort, filter, search, save, and restore analysis results.

10.1.1 Sample Explorer screen

Clicking the [Sample Explorer] icon in the Menu screen displays the following screen.
Alternatively, you can also click the [Explorer] button on the toolbar.



[Sample Explorer] screen

Toolbar

The button of the following functions are displayed.

[Modify]	Click to display the dialog box for modifying the selected data in the analysis data list.
[Validate]	Click to validate the selected analysis data in the analysis data list. If the list was already validated, clicking in the list reset the validation status.
[Filter]	Click to display the submenu that allows you to set the conditions for the data to be displayed in the analysis data list.
[Sort]	Click to display the submenu that allows you to set the sort order for the data to be displayed in the analysis data list.
[Output]	Click to display the submenu for selecting the output destinations.
[Upper]	Click to move the selection up by 1 row.

[Lower]	Click to move the selection down by 1 row.
[FIND]	Click to display a dialog box that allows you to search data.
[Last20]	Click to display the analysis data for the last 20 samples in the analysis data list window. In the filter/sort description box, [Last 20] is displayed. The analysis data are sorted by analysis date in descending order. Toggle off the [Last 20] view to return to the original setting. When a new analysis data is saved, the list is automatically updated. If the list was already filtered, clicking in the list displays all samples.
[File]	Click to display the submenu that allows you to save and restore data.
[Delete]	Click to display the dialog box for deleting the selected data in the analysis data list.

Analysis data list

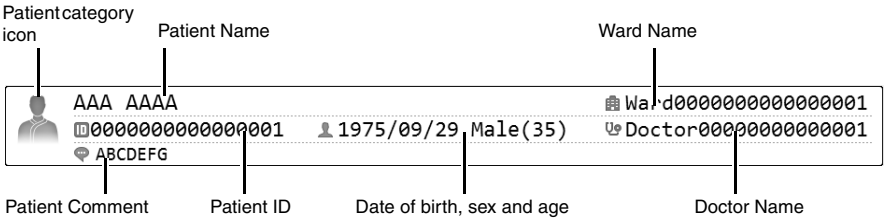
Displays the analysis data selected in the analysis data list. It appears on the sub screen.
For details, see the following.
(➤**P.10-9** "10.1.4 Numerical data of the analysis results")

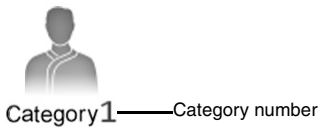
Tab

You can switch between the screens by clicking the tab.

Patient information

Displays the information on the patient selected in the analysis data list.
It appears on the sub screen.



Patient category icon	Displays an icon. Below the icon is the category number of the patient. If there is no corresponding category, no number is displayed. 
Patient Name	Displays the name of the patient (first name, last name).
Patient ID	Displays the patient ID.
Date of birth, sex and age	Displays the date of birth, gender, and age of the patient.
Doctor Name	Displays the name of the doctor assigned to the patient.
Ward Name	Displays the patient's ward name or the name of the clinical service.
Patient Comment	Displays comments about the patient.

Note:

- Items that have not been filled will not be displayed.
- If the currently logged on user does not have privileges to display patient information, only the patient category icon is displayed.

Filter/sort description

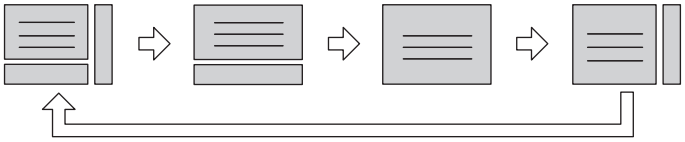
Shows what conditions were used to display the analysis data list. These are the conditions you specified in the filter and sort settings.

For the details on how to read the symbols, see Chapter 7.

(➤**P.7-1** "7.1.1 Work List screen" (●Filter/sort description))

Display switching button

You can click the display switching button to open/close the sub screens. A sub-screen is a screen that is displayed to the right or below the list of analysis data, that can be opened and closed. Click to switch through the 4 patterns in the order "sub-screen (right and bottom)" → "sub-screen (bottom)"→"no sub-screen" → "sub-screen (right)".



Font size button

To change the size of the characters and the line height in the analysis data list, click the character size button. When you change the size setting of the characters, see "Administrator's Guide".

(➤Administrator's Guide, "Chapter 4: 4.3.3 Display settings")

Changing the screen layout

For the details on changing the displayed items, see Chapter 10.

(➤**P.10-31** "10.11 Change layout of analysis data list")

Note:

Multiple data can be selected as follows:

- Drag multiple consecutive rows while holding down the left button on the mouse or.
- While pressing Ctrl, click on the row that you want to select.

10.1.2 Analysis data list

The analysis data list displays common items and selection-based items. Common items are items displayed on all tabs. Selection-based items differ depending on the tab that is selected.
Once the number of stored items exceeds 100,000, each new item that is stored overwrites the item with the oldest analysis date and time.

Information

Analysis results of research parameters are indicated by a gray background to distinguish them from report analysis results. Research items are the parameter for research. Analysis results for these parameters must not be used for diagnosis of patients.

Common items

Common items are displayed in the left section of the analysis data list.

[V] (Validate)	A [V] will appear for validated samples. If a sample has not been validated, nothing is displayed.
[Sample No.]	Displays the sample number.
(Analysis mode)	The column to the left of the [Sample No.] column shows the analysis mode for each sample. [WB]: Whole blood [LW]: Low WBC [PD]: Pre-Dilution [BF]*: Body fluid [HPC]*: HPC [hsA]*: hsA * The availability of these functions depends on your system configuration. If body fluid analysis is performed without clearing the error after an [Analysis result is high] error message is displayed, the background appears in red. For information on [hsA] mode, see the "Administrator's Guide". (➤Administrator's Guide, "Chapter 3: 3.3.2 Checking analysis data")
(Sample information)	The column to the right of the [Sample No.] column indicates how the sample number was obtained. [A]: Automatically incremented [B]: ID barcode scanned [M]: Manually entered [C]: Host computer queried
[Output]	Displays the output status of the analysis results. [D]: Indicates that the analysis results have not been output to Ticket printer (DP). [G]: Indicates that the analysis results have not been output to Graphic printer (GP). [H]: Indicates that the analysis results have not been output to Host computer (HC). It takes a maximum of 40 seconds for an output result to be reflected.
[P/N]	Displays whether an analysis result is Positive or Negative. [D]: Diff. Positive [M]: Morph. Positive [C]: Count Positive On Negative samples no (D), (M), or (C) are indicated at all.

[Action]	Displays an action message, if one exists.
[Check]	Displayed when the sample needs to be checked.
[Review]	Displayed when channel difference has occurs, for example, and the analysis results need to be reviewed.
[Retest]	Displayed when the analysis mode, the order and the status of the sample need to be reviewed, and then need to be re-analyzed.
[Order Type]	Displays the type of order of the analyzed sample.
[Initial]	Analysis order processed for the first time.
[Initial/Repeat]	An order that resulted in an error on the first test for sample analysis and was re-analyzed.
[Rerun]	An order that is automatically triggered to rerun a sample with the same discrete test profile as the initial analysis.
[Reflex]	An order that is automatically triggered to rerun a sample with additional discrete test profiles.
[Rerun/Repeat]	An order that was re-analyzed after the [Rerun] resulted in an error.
[Reflex/Repeat]	An order that was re-analyzed after the [Reflex] resulted in an error.
[Manual]	An order that was analyzed manually.
[Manual (Open)]	An order that was analyzed by cap open analysis.
[Error]	Displays the errors that occurred during the analysis.
[Result]	One of the following errors has occurred: [Blood cannot be aspirated.], [Insufficient blood volume], [Low count error].
[Func.]	An error other than [Result] and Barcode Reader errors has occurred.

Selection-based item

Selection-based items are displayed in the right section of the analysis data list.

● [Sample Info] display screens

If a pending analysis, not all items are displayed.

[Date]	Displays the date when the analysis result was made available.
[Time]	Displays the time when the analysis result was made available.
[Seq.]	A serial number appears for each analyzer used the day of analysis when the IPU was turned on.
[Rack]	Displays the rack number of the sample (for sampler analysis). For all except sampler analysis, nothing is displayed.
[Position]	Displays the sample tube position number of the sample (for sampler analysis). For all except sampler analysis, nothing is displayed.
[Distribution]	Displays abnormal distribution. [R]: Abnormal RBC distribution [P]: Abnormal PLT distribution
[IP (WBC)]	Displays the flag number of the WBC IP message. For details, see Chapter 11. (➤**P.11-25** "Chapter 11: 11.5.2 Table of IP message details")
[IP (RBC)]	Displays the flag number of the RBC/RET IP message. For details, see Chapter 11. (➤**P.11-25** "Chapter 11: 11.5.2 Table of IP message details")
[IP (PLT)]	Displays the flag number of the PLT IP message. For details, see Chapter 11. (➤**P.11-25** "Chapter 11: 11.5.2 Table of IP message details")
[Discrete]	Displays the test profile. For the details on discrete tests, see Chapter 7. (➤**P.7-8** "Chapter 7: Table of discrete tests and their corresponding analysis parameters")
[Rule Result]	Displays the results of the first test, determined according to the rules. Some rules will display the number of comments in parentheses after the determined result. e.g.) [Reflex] with 1 comment:[Reflex (1)]
[Repeat]	The analysis must be repeated due to an error in the first test.
[Rerun]	Analysis must be repeated for the same item as in the first test.
[Reflex]	Analysis must be performed with additional items.
[Query to HOST]	A host inquiry is necessary.
[None]	It is not necessary to make a host inquiry or repeat analysis.
[Sample Comment]	Displays the comment entered when the sample was registered.
[Validator]	If validation was done manually, this field displays the login name of the user. For auto validation, [(Auto Validate)] is displayed.
[Analyzer Nickname]	Displays the name of the analyzer that was used for the analysis of the sample.
[Analyzer ID]	Displays the ID number of the analyzer that was used for the analysis of the sample.

● [CBC], [DIFF], [RET]*, [PLT-F]* display screens

Displays the data relevant to the selected tab.
Some data may have a mark in the next column. For the details, see the following.
(➤**P.10-9** "10.1.4 Numerical data of the analysis results")
* These items do not appear with all analyzer types.

Screen and display items

Screen	Display items
[CBC]	WBC, RBC, HGB, HCT, MCV, MCH, MCHC, PLT, RDW-SD, RDW-CV, PDW, MPV, P-LCR, PCT, NRBC#, NRBC%
[DIFF]	NEUT#, LYMPH#, MONO#, EO#, BASO#, NEUT%, LYMPH%, MONO%, EO%, BASO%, IG#, IG%
[RET]	RET%, RET#, IRF, LFR, MFR, HFR, RET-He
[PLT-F]	IPF

● [Patient Information] display screen

Displays the patient information registered for the analyzed sample.
Patient ID, patient name, gender, date of birth, ward, doctor, and comments are displayed.

● [Reagent] display screen

Displays the lot number of the reagent that was used at the time the sample was analyzed. If the lot number is not registered, nothing is displayed.
The name of the reagent connected to the leftmost instrument connected to the IPU is displayed*.
* If the RU-20 is not connected, CELLPACK DST does not appear. If all analyzers are connected to the RU, CELLPACK DCL does not appear.

For the details on reagents, see Chapter 5.
(➤**P.5-1** "Chapter 5: Reagents")

10.1.3 Check Body fluid analysis data in Sample explorer

Click the [Body Fluid] tab* in the [Sample Explorer] screen to view a list of the body fluid analysis data. The sub screen shows the items analyzed ([ITEM]), numerical data ([DATA]), marks, and the units ([UNIT]) of the sample selected in the analysis data list.

* The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.

The following items are displayed in the [Body Fluid] display screen.
Some data may have a mark in the next column.
For the details, see the following.
(➤**P.10-9** "10.1.4 Numerical data of the analysis results")

Screen and display items*

Screen	Display items
[Body Fluid]	WBC-BF, RBC-BF, MN#, PMN#, MN%, PMN%, TC-BF#

* For details on items for research, see "Administrator's Guide".
(➤Administrator's Guide, "Chapter 3: 3.2 Check items for research")

10.1.4 Numerical data of the analysis results

The analysis data pane of the [Sample Explorer] screen displays the analysis parameters ([ITEM]), their numerical values ([DATA]), marks, and the units ([UNIT]) for the sample that is currently selected in the analysis data list. It appears on the sub screen.

Notations for abnormal data

If there is an abnormality in the analysis data, it is represented by the following masks and marks.

Data masks

Notation	Meaning	Description
[- - - -]	Analysis impossible	Indicates that an analysis error or a parsing error has occurred and the value cannot be displayed.
[++++]	Out of range	Indicates that the data cannot be displayed because the value exceeds the display limit.
[ ]	No order	Indicates that the analysis order does not exist.

Marks*

Notation	Meaning	Description
[*]	Low reliability	Indicates that the reliability of the data is low.
[@]	Out of range	Indicates that the data is outside the linearity limits.
[!]	Exceeds upper panic limit /Below lower panic limit Exceeds upper acceptable background check value limit	Indicates that the value is higher than or less than the clinical panic value. Also indicates that the value is higher than the allowed value for a background check.
[+]	Exceeds upper limit	Indicates that the value is higher than the reference interval.
[-]	Exceeds lower limit	Indicates that the value is less than the reference interval.

* Only 1 mark can be appended per data value. If multiple abnormalities apply to an analysis result, whichever abnormality has the highest priority is notated. Priorities are assigned to the marks in the order they appear in the table above ([*]).

10.2 Validate analysis results

To validate analysis results means to accept them so that they can be output externally for reporting purposes*.

* You cannot validate any results while the last 20 samples are displayed.

Follow the steps below to validate the analysis results.

1 In the list pane, click the analysis result you want to validate.

The analysis result is selected.
You can select multiple items.

2 Click the [Validate] button on the toolbar.

A [V] appears on the left end of the analysis data list.
If multiple lines of analysis results are selected, the validation state of the active (reverse-displayed) line of analysis result is applied to the entire selection. For example, when you validate the active (reverse-displayed) analysis results, other analysis results in the selection also become validate.

Note:

After validating, you cannot change any sample information, such as the sample number.
If you need to change any information, click [Validate] to reset the validation status.

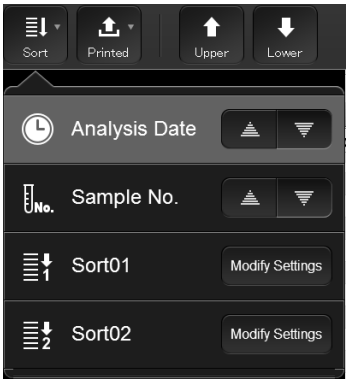
10.3 Sort analysis data list

You can sort the analysis data list by the conditions that you specify*.
The specified conditions are displayed in the filter/sort description box.
* You can sort the results by [Asc.] or [Desc.] of [Analysis Date] only, while the last 20 samples are displayed.

Follow the steps below to sort the list.

1 Click the [Sort] button on the toolbar.

The submenu on the right appears.



2 Click the conditions by which you want to sort the list.

The submenu closes, and the list is sorted.

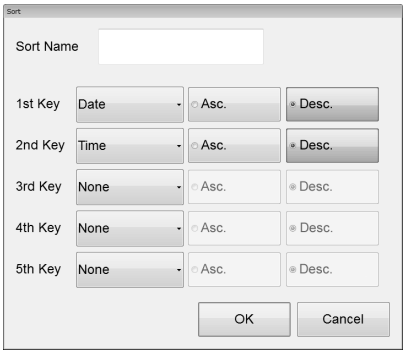
[Analysis Date]	Click to sort first by [Date], then by [Time]. You can select between [Asc.] and [Desc.] using the button on the right. The ascending order/descending order setting is applied to both [Date] and [Time].
[Sample No.]	Click to sort first by [Sample No.], then by [Date] in [Desc.] order, then by [Time] in [Desc.] order. You can select between [Asc.] and [Desc.] using the button on the right. The ascending order/descending order setting is applied to [Sample No.]. Regardless of the setting, [Date] and [Time] is always descending order.
[Sort 01], [Sort 02]	Click to sort by the criteria specified in [Sort 01] or [Sort 02].
[Modify Settings]	Click to change the settings for [Sort 01] or [Sort 02].

Modify Settings

You can change the settings for [Sort 01] and [Sort 02].
Follow the steps below to change the settings.

1 Click [Modify Settings].

The dialog box on the right appears.



2 Populate the displayed fields.

You can specify a [Sort Name]. You can enter up to 20 characters.
In fields [1st Key] through [5th Key], specify the sort conditions.
The sort conditions are prioritized from [1st Key] to [5th Key].
After selecting the keys, sort the alphanumeric in [Asc.] (0 to 9, A to Z) or [Desc.] (9 to 0, Z to A) order.

[Date]	Sorts by date of analysis.
[Time]	Sorts by time of analysis.
[Sample No.]	Sorts by sample number.
[Rack No.]	Sorts by rack number.
[Tube Pos.]	Sorts by sample tube position number.
[Sequence No.]	Sort by the serial number, incremented the analysis day.
[None]	Conditions not specified.

3 Click [OK].

The dialog box closes, and sorting is applied.

10.4 Specify data display conditions

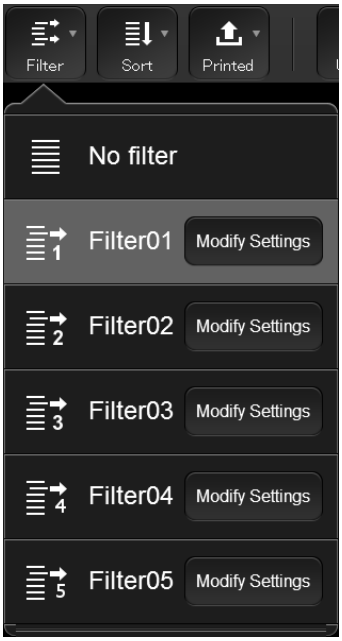
You can specify conditions for the samples you want displayed in the analysis data list*.

* You cannot specify any conditions while the last 20 samples are displayed.

Follow the steps below to specify conditions for the data you want displayed.

1 Click the [Filter] button on the toolbar.

The submenu on the right appears.



2 Click the display conditions.

The submenu closes, and the samples that match the conditions are displayed in the list.

[No filter]	Click to display all sample information. If the filter was applied, this removes the filter.
[Filter 01] to [Filter 05]	Click to display samples that match the conditions set in the corresponding filter.
[Modify Settings]	Click to change the setting for the corresponding filter.

Note:

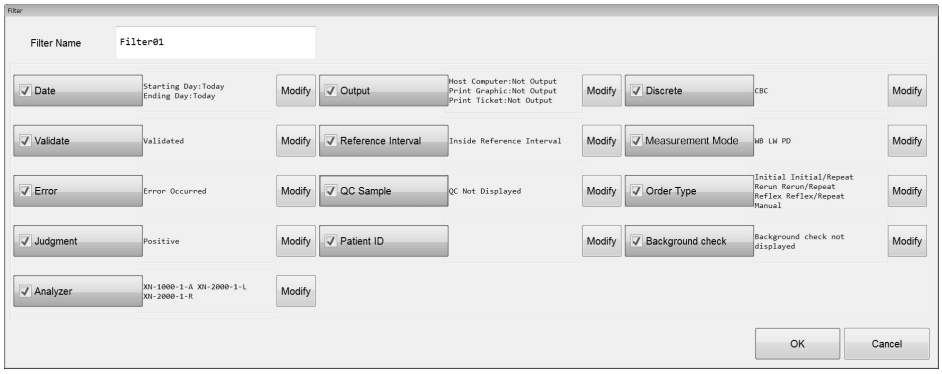
If the data is selected with display conditions specified and a condition is no longer satisfied due to the date being changed or other reason, the selected state cannot be maintained. A dialog that notifies you of the change of selection range appears.

Modify settings

You can change the settings for [Filter 01] through [Filter 05].
Follow the steps below to change the settings.

1 Click [Modify Settings].

The following dialog box appears.

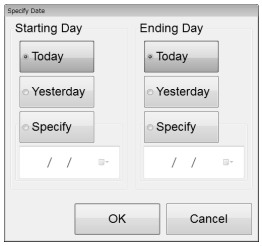


2 Populate the displayed fields.

[Filter Name]	You can change the filter name. You can enter up to 20 characters.

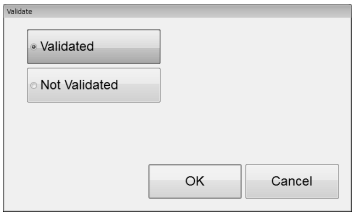
● Date

[Date]	Select this check box to specify the samples you want displayed by their dates of analysis. The setting appears on the right side of the button.
[Modify]	Click to display the dialog box on the right. Click to select [Today], [Yesterday] or [Specify]. Selecting [Specify] allows you to specify the date. In the field below [Specify], enter the date in the format "Year (4 digits)/Month (2 digits)/Date (2 digits)". If you click the button on the right edge of the input field, a calendar appears. You can also enter the date by selecting from this calendar.



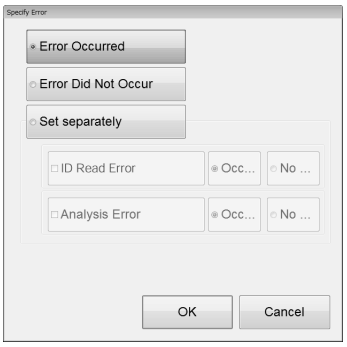
● Validate

[Validate]	Select this check box to specify the samples you want displayed by whether or not they have been validated. The setting appears on the right side of the button.
[Modify]	Click to display the dialog box on the right. Select [Validated] or [Not Validated].



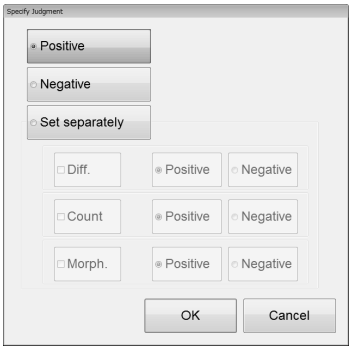
● Error

[Error]	Select this check box to specify the samples you want displayed by their error statuses. The setting appears on the right side of the button.
[Modify]	Click to display the dialog box on the right. Select [Error Occurred], [Error Did Not Occur], or [Set separately]. If you select [Set separately], specify [ID Read Error] and/or [Analysis Error] by selecting the corresponding check box(es). Select [Occurred] or [Not Occurred] for the error(s) you specified.

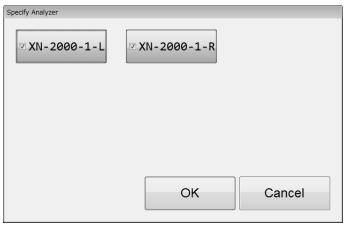


● Positive/Negative

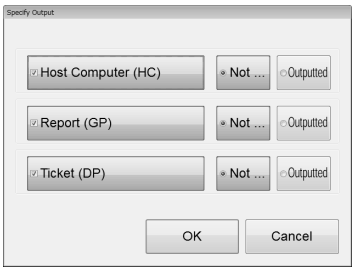
[Judgment]	Select this check box to specify the samples you want displayed by their Positive/Negative results. The setting appears on the right side of the button.
[Modify]	Click to display the dialog box on the right. You can select [Positive], [Negative], or [Set separately]. If you select [Set separately], specify [Diff.], [Count], and/or [Morph.] by selecting the corresponding check box(es). Select [Positive] or [Negative] for the items you specified.



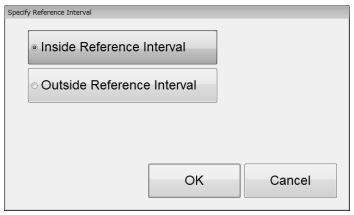
● Analyzer

[Analyzer]	Select this check box to specify the samples you want displayed by the analyzer(s) that was used for the analysis. The setting appears on the right side of the button. This is displayed only if multiple analyzers are connected to the IPU.
[Modify]	Click to display the dialog box on the right. The connected Instrument Nickname(S) are displayed as buttons. Select the check box(es) to specify the analyzer(s) of the samples you want displayed. 

● Output

[Output]	Select this check box to specify the samples you want displayed by their output destinations. The setting appears on the right side of the button.
[Modify]	Click to display the dialog box on the right. You can specify [Host Computer (HC)], [Report (GP)], and/or [Ticket (DP)] by selecting the corresponding check boxes, and select [Not Output] or [Outputted] for each item. 

● Reference Interval

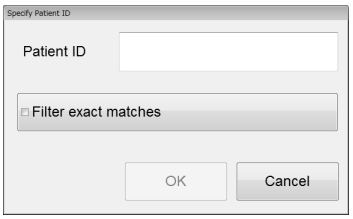
[Reference Interval]	Select this check box to specify the samples you want displayed by whether or not they are within the reference interval. The setting appears on the right side of the button.
[Modify]	Click to display the dialog box on the right. Select [Inside Reference Interval] or [Outside Reference Interval]. 

● QC

[QC Sample]	Select this check box to specify the samples you want displayed by their QC status. The setting appears on the right side of the button.
[Modify]	Click to display the dialog box on the right. Select [QC Displayed] or [QC Not Displayed].

● Patient ID*

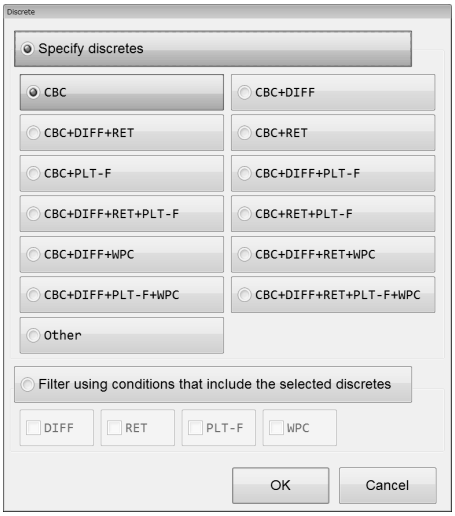
[Patient ID]	Select this check box to specify the samples you want displayed by their patient IDs. The setting appears on the right side of the button.
[Modify]	Click to display the dialog box on the right. Enter the [Patient ID]. You can enter up to 16 characters. Enter the [Patient ID] and click [OK] to display samples that partially match the entered Patient ID. To display samples that match the entered Patient ID exactly, select the check box [Filter exact matches].



* This is displayed only if the user who is logged in has the privileges to display and modify patient info. For details on privileges to display and modify patient info, see the "Administrator's Guide". (➤Administrator's Guide,"Chapter 4: 4.3.2 System settings")

● Discrete

[Discrete]	Select this check box to specify the samples you want displayed by the status of their discrete tests. The setting appears on the right side of the button.
[Modify]	Click to display the dialog box on the right. Specify the discrete tests by selecting the corresponding check box(es)*. When you select the [Specify discretes] check box, the filter will include the selected discrete test. If you select [Other], the selectable discrete tests will be filtered out. When you select the [Filter using conditions that include the selected discrete test] check box, the filter will include any discrete tests that partially match the selected discrete test. For details on discrete tests, see Chapter 7. (➤**P.7-8** "Chapter 7: Table of discrete tests and their corresponding analysis parameters")



* These items do not appear with all analyzer types.

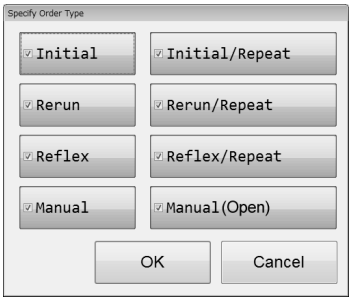
● Analysis mode

[Measurement Mode]	Select this check box to specify the samples you want displayed by their analysis modes. The setting appears on the right side of the button.
[Modify]	Click to display the dialog box on the right. Select the checkbox to set [WB] ([Whole Blood] mode), [LW] ([Low WBC] mode), [PD] ([Pre-Dilution] mode), [BF] ([Body Fluid] mode)*, [HPC] ([HPC] mode)*, and [hsA] ([hsA] mode)*.

* The availability of these functions depends on your system configuration.

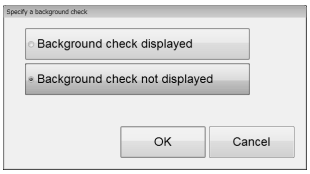
● **Order type**

[Order Type]	Select this check box to specify the samples you want displayed by their order types. The setting appears on the right side of the button.
[Modify]	Click to display the dialog box on the right. You can specify [Initial], [Initial / Repeat], [Rerun], [Rerun /Repeat], [Reflex], [Reflex / Repeat], [Manual], and/or [Manual (Open)] by selecting the corresponding check box(es).



● **Background check**

[Background check]	Select this check box to specify the samples you want displayed by their background check status. The setting appears on the right side of the button.
[Modify]	Click to display the dialog box on the right. Select [Background check displayed] or [Background check not displayed].



3 Click [OK].

The dialog box closes, and the filter settings change.

10.5 Search for a sample

You can search the analysis data list for a specific sample*.

* You cannot search for any samples while the last 20 samples are displayed.

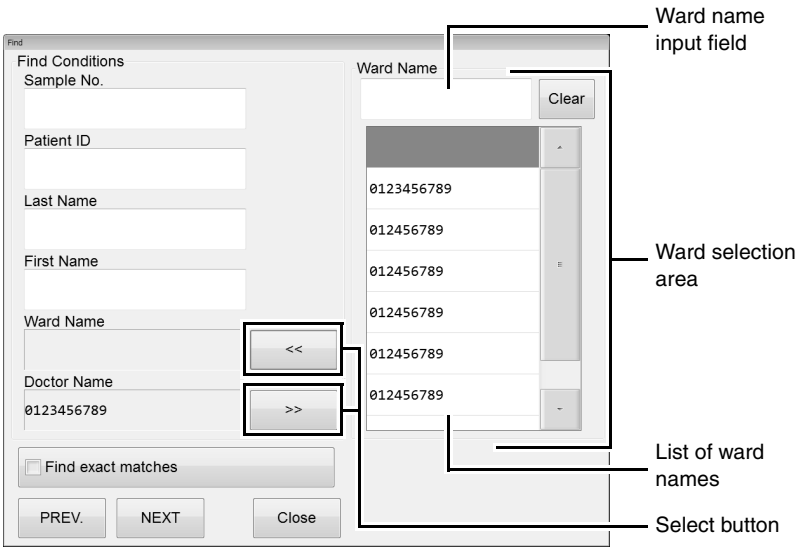
Follow the steps below to search for a sample.

1 Click the [FIND] button on the toolbar.

The following dialog box appears.

In the following dialog box, the ward selection area appears*.

* In the default setting, ward selection area does not appear.



Note:

The doctor selection area is similar to the ward selection area. Use the above dialog box as a reference for the doctor selection area.

2 Populate the displayed fields.

● [Search Conditions]

The specified items are used as search conditions.

[Sample No.]	Enter the sample number. You can enter up to 22 characters.
[Patient ID]	Enter the patient's ID. You can enter up to 16 characters.
[Last Name]	Enter the patient's last name. You can enter up to 20 characters.
[First Name]	Enter the patient's first name. You can enter up to 20 characters.
[Ward Name]	Displays the selected ward name.
Select button	Clicking the button displays the ward selection area on the right side of the dialog box.
[Doctor]	Displays the selected doctor for the patient.
Select button	Clicking the button displays the doctor selection area on the right side of the dialog box.

● Ward/Doctor selection area

Ward name/ Doctor input field	Enter a conditions to narrow down the ward names/doctors. You can enter up to 20 characters.
List of ward names/doctors	Displays the ward names/doctors that contain the conditions that you entered. Click to select the ward name/doctor. You can only select 1 ward name/doctor.
[Clear]	Click to clear the narrowed down ward name/doctor.

Note:

You can enter "*" and "?" as substitution characters in your search.

"?": A "?" is used in place of any 1 character.
e.g. If you search for "99?99", "99099", "99999" and "99A99" are all selected.

"*": A "*" is used in place of 0 or more characters.
e.g. If you search for "9*9", "909", "9119" and "99A99" are all selected.

3 Set the search conditions for a match.

If you want to find analysis data that match the specified conditions exactly, select the [Find exact matches] check box. If you clear the check box, it will also find samples that partially match the specified conditions.

4 Click [PREV.] / [NEXT].

A sample that matches the search conditions is selected in the list pane.

[PREV.]	Click to search up from the analysis result selected in the list pane.
[NEXT]	Click to search down from the analysis result selected in the list pane.

5 Click [Close].

The dialog box closes.

10.6 Modify sample information

You can modify the sample information from the analysis data list*.
When sample information is modified, the identification of analysis data changes. Exercise this operation very carefully.

* If the selected sample in the analysis data list is validated, or if the analysis data list for the last 20 samples is displayed, you cannot modify any sample information.

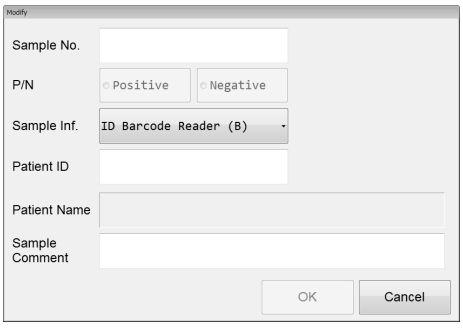
Follow the steps below to modify sample information.

1 In the list pane, click the sample you want to modify.

The sample information is selected.

2 Click the [Modify] button on the toolbar.

The dialog box on the right appears.



3 Populate the displayed fields.

[Sample No.]	Displays the sample number. You cannot modify the rule without entering the sample NO. You can enter up to 22 characters.
[P/N]	Displays the Positive/Negative result of the sample. You can modify a Positive result to Negative. If the result is Negative, the setting is grayed out and cannot be modified. However, if it is a Negative result with [DIFF], [MORPH], or [COUNT], then the setting can be modified.
[Sample Inf.]	Displays the sample number attribute. You can select from [Manual Setting (M)], [Auto Increment (A)], [ID Barcode Reader (B)], or [Host Setting (C)].
[Patient ID]*	Displays the [Patient ID]. You can enter up to 16 characters.
[Patient Name]	Displays the patient name retrieved by [Patient ID]. You cannot modify it.
[Sample Comment]	Displays comments about the sample. You can enter up to 40 characters.

* If the patient ID was changed, delta check is performed.

4 Click [OK].

The modified sample information is saved.

10.7 Print analysis data

From the analysis data list in the [Sample Explorer] screen, you can print the analysis data for the selected sample to various output destinations*.

Up to 300 samples can be output at once.

* The analysis data cannot be printed in the following cases.
  - If the sample has not been validated.
  - If the analysis data list for the last 20 samples is displayed.
  - If you are not connected to any host computer or printers.

10.7.1 Output to host computer or printer

Follow the steps below to output to the host computer or the printer.

1 In the list pane, click the sample you want to output.

The sample information is selected.

You can select multiple items.

2 Click the output destination from the [Output] button on the toolbar.

The analysis data is output to the specified destination*.

* Destinations that are not connected are grayed out and cannot be clicked.

[Host Computer (HC)]	Outputs to the host computer.
[Ticket (DP)]	Prints to a ticket printer.
[Report (GP)]	Prints to a graphic printer in report format.
[Ledger (LP)]	Prints to a ledger printer.
[Report for Lab Use Only]	Prints to a graphic printer for laboratory use only.

10.7.2 Save in CSV/FCS format

You can select any analysis data in the [Sample Explorer] or [Data Browser] screens, and save it in CSV*1/ FCS*1,2 format.

*1 You cannot save while the last 20 samples are displayed.

*2 Analysis data from program versions prior to 00-12 and restored analysis data cannot be saved.

Information

When saving in CSV format, use caution on the following:

- IP messages are intended for use only in the clinical laboratory and are not for patient diagnosis. IP messages provide notification of the possibility of a specific sample abnormality based on examination of the analysis data.
- Do not use analysis results of any research parameter for the patient diagnosis.

Note:

When saving in CSV format, use caution on the following:

- The order of the saved parameters cannot be changed.
- Headers of research parameters are enclosed in [ ].
- Scattergrams and particle size distributions are saved individually as image files*.
- If the analysis data exceeds 256 parameters, 256 columns of data are saved as 1 file*.

* Depends on the configuration of IPU.

Follow the steps below to save the analysis data in CSV/FCS format.

1 In the analysis data list pane, click the sample you want to save.

The sample information is selected.
You can select multiple items.

2 Click the [File] button - [Output in CSV Format]/[Output in FCS Format] on the toolbar.

The [Save As] dialog box appears.

3 Specify or create the folder to save the sample data into.

4 Enter a file name.

● **CSV Format**

The file extension is ".csv".

The extension for scattergrams and other image files is ".bmp" or ".png".

● **FCS Format**

The file extension is ".fcs".

Note:

- The default file name of CSV format is set to [XN][software version][SAMPLE].csv
  e.g. [XN][00-01][SAMPLE].csv
- The default name of CSV format for the image file is set to
  [Analyzer ID][software version][analysis date_analysis time][sample number]
  [image name].png (or bmp).
  e.g. [XN][00-01][20100505_080808][1234][RBC].png
- The default file name of FCS format is set to
  [Analyzer ID][software version][Fcs][analysis date_analysis time][sample number][Channels].fcs
  e.g. [XN-20^11001][00-01][Fcs][20100505_080808][123456789][WNR].fcs
- If a character that cannot be used in a file name in Windows (\/:*?"<>|) is included in a sample number, the character is automatically converted to a space.

5 Click [Save].

The data is saved in the specified format.

Note:

If you selected multiple data for save, the data will be saved in order from the top of list.

10.8 Save analysis data

You can save analysis data*.
Up to 1,000 entries of analysis data can be saved.
* You cannot save any analysis data while the last 20 samples are displayed.

Follow the steps below to save analysis data to a file.

1 In the list pane, click the sample you want to save.

The sample information is selected.
You can select multiple items.

2 Click the [File] button - [Backup] on the toolbar.

The [Open] dialog box appears.

3 Specify or create the folder to save the sample data into.

4 Check the file name.

The file extension is ".smp".

Note:

- The file name is set to
  [Analyzer ID][software version][Sample][analysis date_analysis time][sample number].smp.
  e.g. [XN][00-01][Sample][20100505_080808][1234].smp
- If a character that cannot be used in a file name in Windows (\/:*?"<>|) is included in a sample number, the character is automatically converted to a space.

5 Click [Save].

A dialog that allows you to check progress appears.
When the save is finished, the dialog box closes.
The data are saved to the specified file*.
* Whether or not the backup data includes patient information depends on the IPU security settings.
  For information on security, see the "Administrator's Guide".
  (➤Administrator's Guide,"Chapter 4: 4.3.2 System settings")

Note:

If you selected multiple samples, all selected data are backed up to multiple single smp files.

10.9 Restore saved analysis data

You can restore saved analysis data*.
Up to 1,000 entries of analysis data can be restored.
* You cannot restore any analysis data while the last 20 samples are displayed.

Follow the steps below to restore saved analysis data.

1 Click [File] - [Restore] on the toolbar.

The [Open] dialog box appears.

2 Select the name of the file you want to restore.

The file you can open is ".smp".
You can select multiple items.

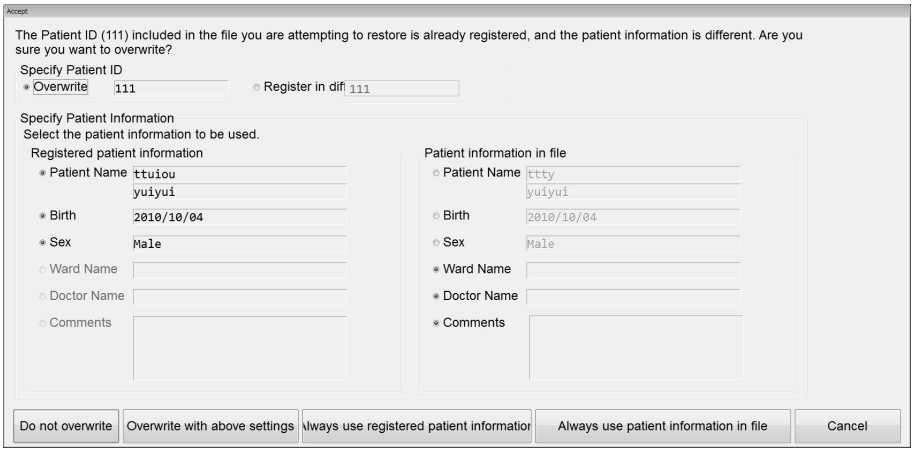
3 Click [Open].

A dialog that allows you to check progress appears.
When restoring is finished, the dialog closes.
The analysis data is restored*.
* If the user who is logged in does not have the privileges to display and modify patient info, a dialog box appears to warn the user that patient info cannot be restored.
For details on privileges to display and modify patient info, see the "Administrator's Guide".
(➤Administrator's Guide,"Chapter 4: 4.3.2 System settings")

● **If a data entry with the same [Patient ID] already exists**

If the same [Patient ID] as the data you are restoring has already been registered in patient registration, the following dialog box is displayed*.

* If the patient informations matches to the registered informations exactly, this dialog does not appear.



Follow the steps below to specify the patient's ID and information.

1 Specify patient ID.

Select [Overwrite] or [Register in different ID].
You can enter up to 16 characters in the [Register in different ID] field.

2 Specify patient information.

Select which items of the patient information you want to use.
If you want to select all items in [Registered patient information] or [Patient information in file], click [Always use registered patient information] or [Always use patient information in file].

3 Click [Overwrite with above settings].

The patient ID and the patient information are overwritten.

10.10 Delete analysis data

You can delete the selected analysis data from the analysis data list*.

* You cannot delete any analysis data while the last 20 samples are displayed.

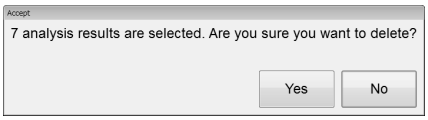
Follow the steps below to delete analysis data.

1 In the list pane, click the analysis data you want to delete.

The sample information is selected.
You can select multiple items.

2 Click the [Delete] button on the toolbar.

The dialog box on the right appears.



3 Click [Yes].

The selected analysis data is deleted from the analysis data list.

10.11 Change layout of analysis data list

You can change the layout of the analysis data list in the [Sample Explorer] screen.
Follow the steps below to change the layout of the analysis data list.

1 Right click on the tab or the analysis data list of the [Sample Explorer] screen.

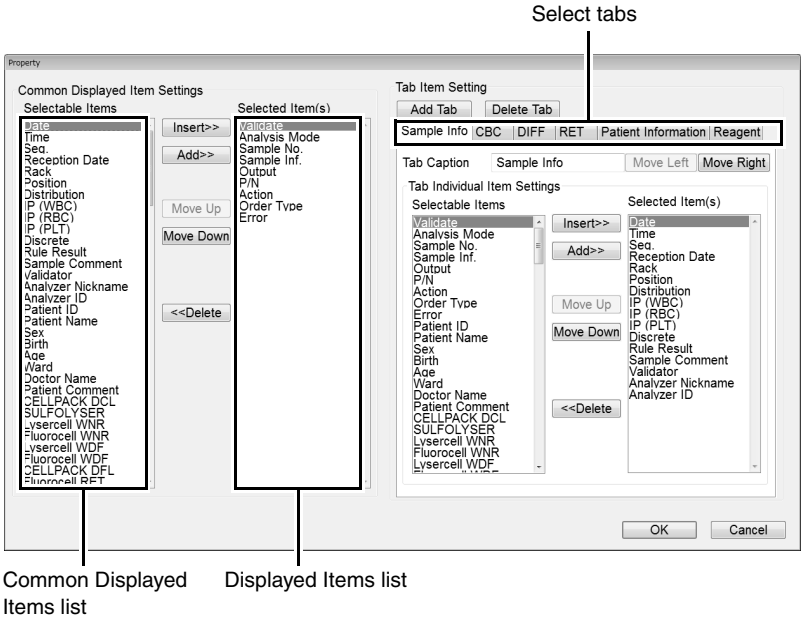
A context menu opens.

2 Click the item you wish to change.

You can populate the displayed fields.

- **[Property]**

The following dialog box appears.



Common Displayed Item Settings

[Selectable Items]	Displays the items that can be set as common items and all items for research*.
[Selected Item(s)]	The items in this list will be displayed in the analysis data list as common displayed items.
[Insert]	Click to move the selected item from Common Displayed Items list to the Items list, above the selected item.
[Add]	Click to move the item you selected in the Common Displayed Items list to the bottom of the Displayed Items list.
[Move Up]	Click to move up the selection in the Displayed Items list by 1 item.
[Move Down]	Click to move down the selection in the Displayed Items list by 1 item.
[Delete]	Click to move the item you selected in the Displayed Items list to the bottom of the Common Displayed Items list.

* To display the items for research, the IPU setting is required. For details, see "Administrator's Guide". (➤Administrator's Guide "Chapter 4: 4.3.2 System settings") And, the items for research are displayed on gray background.

Tab Item Setting*

[Add Tab]	Click to add a new tab to the right of the rightmost tab in the select tabs. The name of the new tab is "Tab", and nothing is displayed in the Displayed Items list. If there are maximum number of tabs (20 tabs), this button is grayed out and cannot be clicked.
[Delete Tab]	Click to delete the tab that is currently displayed in the analysis data list.
Select tabs	Allows you to change the individual items for the tab you clicked.
[Tab Caption]	Allows you to change the caption displayed on the tab. You can enter up to 20 characters.
[Move Left]	Click to move the tab selection to the left by 1 tab.
[Move Right]	Click to move the tab selection to the right by 1 tab.

* The functions of the [Insert], [Add], [Move Up], [Move Down], [Delete] buttons are the same as described in the "Common Displayed Item Settings" section.

● **[Backup]**

Click to display the [Save As] dialog box. Enter a file name and click [OK] to save the layout.
The file extension is ".elf".

> **Note:**
> The default file name is set to [XN][software version][ExplorerLayout].elf.

● **[Restore]**

Click to display the dialog box. Select a file name and click [OK] to restore a layout. The file extension is ".elf".

● **[Initialize]**

Click to display the dialog box for confirming reset the layout to factory setting. Click [Yes] to have the layout initialized.

3 Click [OK].

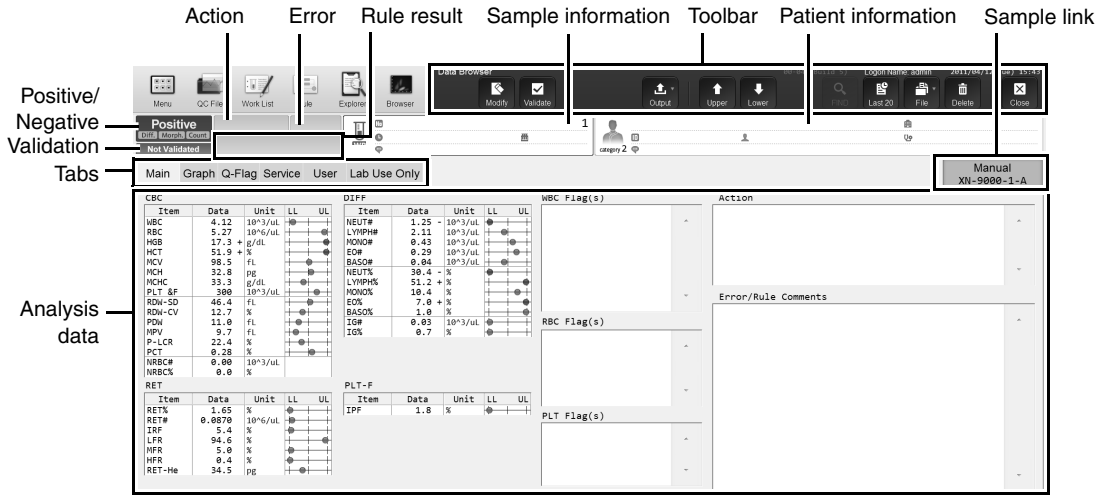
The dialog box closes, and the layout of the analysis data list changes.

Chapter 11 Checking detailed analysis information (Data Browser)

This section explains how to check detailed information on analysis data.

11.1 Data Browser screen

In the [Sample Explorer] screen, double-clicking a sample data displays the [Data Browser] screen. Alternatively, you can also display the screen by selecting the sample you want to display, and clicking the [Data Browser] icon on the Menu screen, or the [Browser] button on the toolbar.



[Data Browser] screen

Toolbar

The functions in the toolbar of Data Browser are similar to the toolbar of Sample Explorer. For details, see Chapter 10. (➤**P.10-1** "Chapter 10: 10.1.1 Sample Explorer screen" (Toolbar)) However, the function of [File] is only [Output in CSV Format]. You cannot backup and restore the file.

Navigating in the screen

You can switch the screen by clicking the display-switching tab.

11.1.1 Common displayed items

This section explains the common items that are displayed on all tabs, in the top section of the [Data Browser] screen.

Tabs

Click to switch to a different analysis data display. When the analysis data is from [Body Fluid], [HPC] or [hsA] mode, the contents of the displayed tabs change.

* The availability of these functions depends on your system configuration.
For information on [hsA] mode, see the "Administrator's Guide".
(➤Administrator's Guide, "Chapter 3: 3.3.2 Checking analysis data")

Positive/Negative, Validation

Displays the Positive/Negative result, and validation status.

Positive/Negative result

If the Positive/Negative result cannot be determined, the background becomes gray and nothing is displayed.
If there are no samples, or if the Positive/Negative result has not been determined, nothing is displayed.

[Positive]	This is displayed in white letters on red background, if there were any abnormalities in the blood cell count or blood cell morphology. The following Positive results are displayed on the right side.
[Diff.]	Indicates an abnormal blood cell differentiation value.
[Morph.]	Indicates an abnormal cell morphology.
[Count]	Indicates an abnormal blood cell count.
[Negative]	[Negative] is displayed if the sample had no errors.

Validation

If there are no samples, nothing is displayed.

[Validated]	This is displayed to indicate that the analysis data has been validated.
[Not Validated]	This is displayed to indicate that the analysis data has not been validated.

Action, Error, Rule result

Displays the determined actions, errors, and rules.

Action

Nothing is displayed if there are no action messages or no samples.

The details of the action message are displayed in the [Action] field in the analysis data pane.

[Action]*	If there is an action message, it is displayed in white letters on red background. The details appear on the below.
[Check]	There may be a mix-up of samples. Otherwise, there is a significant difference in the analysis results. Check the sample.
[Review]	Channel difference has occurred. Check the analysis results.
[Retest]	Check the analysis mode, the order and the status of the sample, and then re-analyze.

* Use the analysis results only for testing in the clinical laboratory. They are not intended for patient diagnosis.

Error

If an analysis error occurred, [Error] is displayed in white letters on red background. Nothing is displayed if there are no errors. The details of the error message are displayed in the [Error/Rule Comments] field in the analysis data pane.

[Func.]	An analysis error other than the ID barcode read error or [Result] has occurred.
[Result]	One of the following analysis errors has occurred: [Blood cannot be aspirated.], [Insufficient blood volume], [Low count error].

Rule result

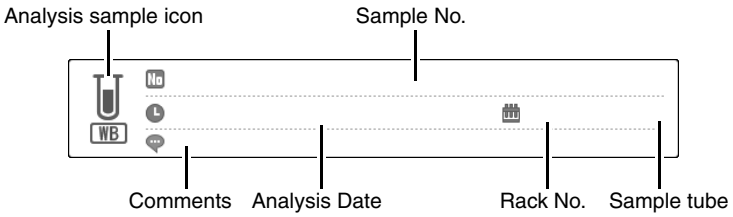
Nothing is displayed if there are no samples.

If there are any comments, the comment icon and the number of comments are displayed on the right side of [Rule Result]. The details of the comment are displayed in the [Error/Rule Comments] field in the analysis data pane.

[Repeat]	The analysis must be repeated due to an error in the first test.
[Rerun]	Analysis must be repeated for the same item as in the first test. The analyzer to be used for re-analysis is displayed on the right.
[Different]	Analysis must be performed using a different analyzer than that of the first test.
[Same]	Perform the analysis using the same analyzer as the first test.
[Any]	It does not matter which analyzer you use for the analysis.
[Reflex]	Due to the results from the first test, analysis must be performed with additional items. The discrete test to be added is displayed on the right. If [LW_DIFF] was added, [LW] and [DIFF] are displayed.
[Query to HOST]	A host inquiry is necessary.
[None]	The result is that it is not necessary to make a host inquiry or repeat analysis.

Sample information

Displays the sample information of the analysis data.



Analysis sample icon	An icon is displayed to indicate the analysis sample. [WB] (Whole Blood sample) / [LW] (Low WBC sample) / [PD] (Pre-diluted sample) / [BF] (Body Fluid sample)* / [HPC] (HPC analysis sample)* / [hsA] (hsA analysis sample)* are displayed.
Sample No.	Displays the sample number.
Analysis Date	Displays the date when the analysis result was made available.
Rack No.	Displays the rack number of the analyzed sample.
Sample tube	Displays the sample tube position number of the analyzed sample.
Comments	Displays comments about the sample.

* The availability of these functions depends on your system configuration. If you performed body fluid analysis without clearing a [Analysis result is high], "BF" will be displayed in white on a red background and the body fluid icon will appear darker.

Patient information

Displays the patient information of the analysis data.

Sample link

The order type of the displayed analysis sample and the analyzer used for analysis are displayed in buttons in the selected state. If the sample has [Initial], [Repeat], [Rerun], or [Reflex] information, corresponding buttons appear. Information on the same analyzer appears.

Click the sample link button to display the applicable analysis data in the [Data Browser] screen.

11.1.2 Display analysis data

The analysis data pane displays the details of the data selected in the analysis data list. The method of displaying the data differs depending on the selected tab.

Information

Analysis results of research parameters are indicated by a gray background to distinguish them from report analysis results. Research items are the parameter for research. Analysis results for these parameters must not be used for diagnosis of patients.

Notations for abnormal data

If there is an abnormality in the analysis data, it is represented by the following masks and marks.
For the details on masks and marks, see Chapter 10.
(➤**P.10-9** "Chapter 10: 10.1.4 Numerical data of the analysis results")

11.2 Check all information

You can check all information about the analysis data in the [Main] and [Graph] screens.

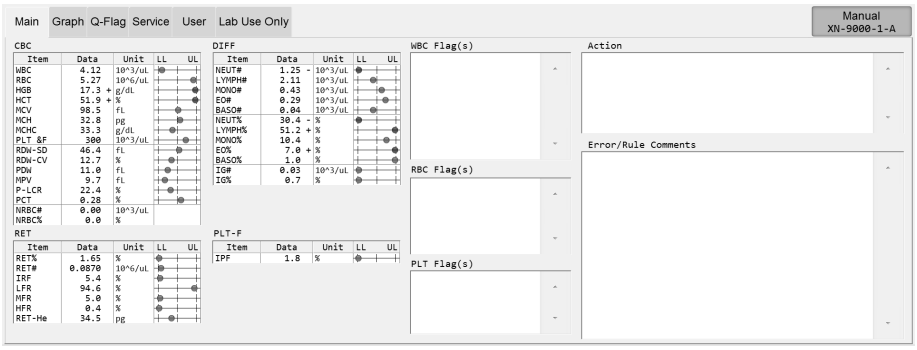
11.2.1 Main screen

Clicking the [Main] tab displays the following screen.

[Whole Blood] / [Low WBC] / [Pre-Dilution] / [HPC]* mode

When displaying analysis data, the following items are displayed in the main screen: Analysis parameters, all reportable numerical data, flag information, SD Bar, action, rule comment and error message.

* The availability of the HPC analysis function depends on your system configuration.



[Main] screen

[Item]*1,2	Displays analysis parameters.
[Data]*2	Displays the numerical data for each parameter. If there is an abnormality in the data, [*] will appear after the value.
[Unit]*2	Displays the unit of each parameter.
[LL UL]*2	For each parameter, the SD Bar displays its deviation from the normal range. A green dot in the SD Bar turns red if the upper or lower limit is exceeded. However, if the analysis result is not applicable for a reference interval judgment, or the lower limit is set higher than the higher limit, nothing is displayed. Normal range: A green dot is displayed inside the upper/lower limits.  Abnormal range: Red dots are displayed at the upper/lower limits. 
[WBC Flag(s)]	Displays WBC IP messages, if one exists. The messages are displayed in the order of abnormal messages, then suspect messages.
[RBC Flag(s)]	Displays RBC IP messages, if one exists. The messages are displayed in the order of abnormal messages, then suspect messages.
[PLT Flag(s)]	Displays PLT IP messages, if one exists. The messages are displayed in the order of abnormal messages, then suspect messages.
[Action]	Displays an action message, if one exists.
[Error/Rule Comments]	Displays the error message and/or rule comment, if one exists. The rule comments are sorted by priority with the highest priority on top, and then by rule number in ascending order.

*1 These items do not appear with all analyzer types.

*2 The items for research are displayed on gray background.

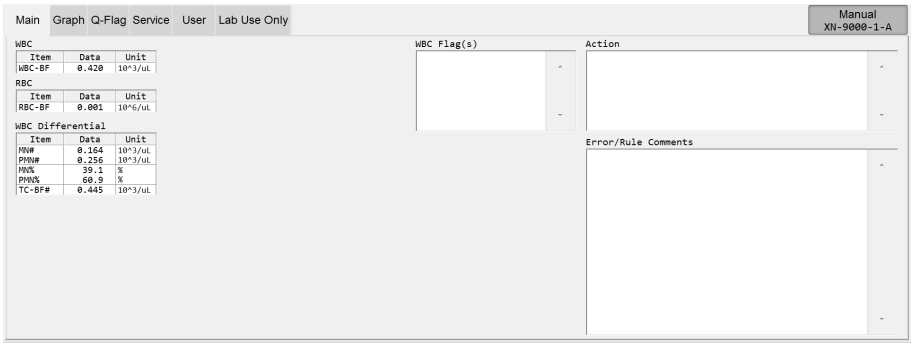
Note:

The action message [Suspect sample, check the sample.] appears when it is suspected that the sample was not sufficiently mixed before being placed in the analyzer. This message may also appear when there is an extended time between mixing and analysis, when the sample has a high degree of sedimentation, when the sample has been refrigerated/transported in a cool environment, or when the sample has a high RBC count or high HCT value. If this message appears, check the sample.

[Body Fluid] mode*

When displaying analysis data, the following items are displayed in the main screen: Analysis parameters, all numerical data, flag information, action, rule comment and error message.

* The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.



[Main] screen

[Item]*	Displays analysis parameters.
[Data]*	Displays the numerical data for each parameter. If there is an abnormality in the data, [*] will appear after the value.
[Unit]*	Displays the unit of each parameter.
[WBC Flag(s)]	The WBC IP messages are displayed in the order of suspect messages, then abnormal messages.
[Action]	Displays an action message, if one exists.
[Error/Rule Comments]	Displays the error message or rule comment, if one exists. The rule comments are sorted by priority with the highest priority on top, and then by rule number in ascending order.

* The items for research are displayed on gray background.

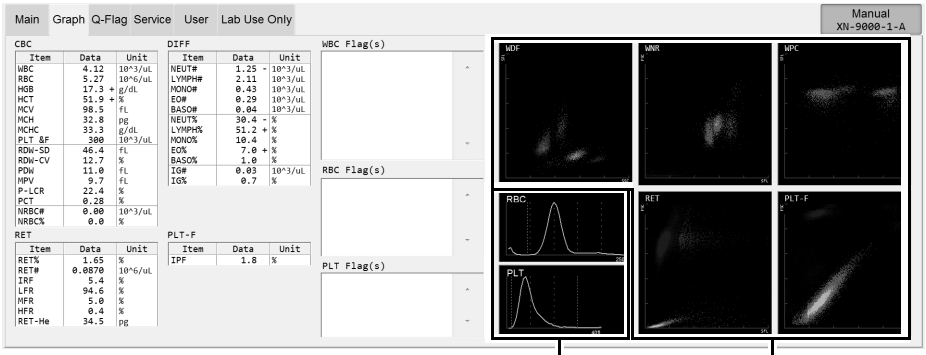
11.2.2 Graph screen

Clicking the [Graph] tab displays the following screen.

[Whole Blood] / [Low WBC] / [Pre-Dilution] / [HPC]* mode

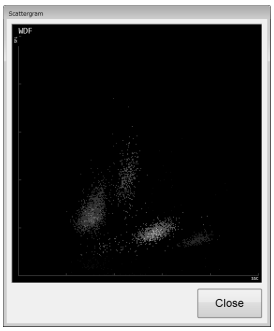
When displaying analysis data, the following items are displayed in the [Graph] screen: Analysis parameters, all reportable numerical data, flag information, distribution data, and scattergram.

* The availability of the HPC analysis function depends on your system configuration.



[Graph] screen

The display of [Item], [Data], [Unit] and flag informations are same to the [Main] screen.
See the [Main] screen explanation of whole blood or diluted sample as a reference for the [Graph] screen.
(➤**P.11-5** "11.2.1 Main screen")

Distribution data display area	Displays the distributions for [RBC] and [PLT]. Double-click to display an enlarged view in a new window.
Scattergram display area	Displays 2-dimensional distributions (scattergrams) for [WDF], [WNR], [WPC]*1,2, [RET]*1, [PLT-F]*1 and [PLT-O]*1. Double-click to display an enlarged view in a new window. 

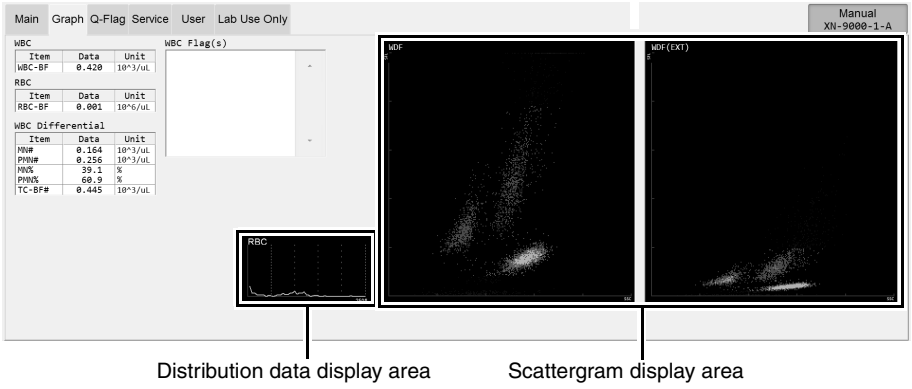
*1 These items do not appear with all analyzer types.

*2 For HPC analysis, [WPC(SSC-FSC)] is displayed.

[Body Fluid] mode*

When displaying analysis data, the following items are displayed in the graph screen: Analysis parameters, all reportable numerical data, flag information, distribution data, and scattergram.

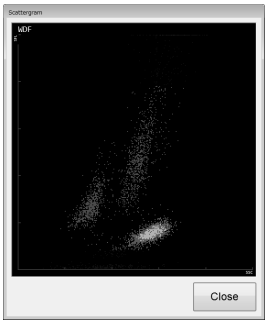
* The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.



[Graph] screen

The display of [Item], [Data], [Unit] and flag informations are same to the [Main] screen.
See the [Main] screen explanation of body fluid sample as a reference for the [Graph] screen.
(➤**P.11-7** "[Body Fluid] mode*")

Distribution data display area	Displays the distributions for [RBC]. Double-click to display an enlarged view in a new window.
Scattergram display area	Displays 2-dimensional distributions (scattergrams) for [WDF]. Double-click to display an enlarged view in a new window.



11.2.3 Change layout of HPC screen

You can change the layout of the analysis data list in the [HPC] screen.
Follow the steps below to change the layout of the analysis data list.

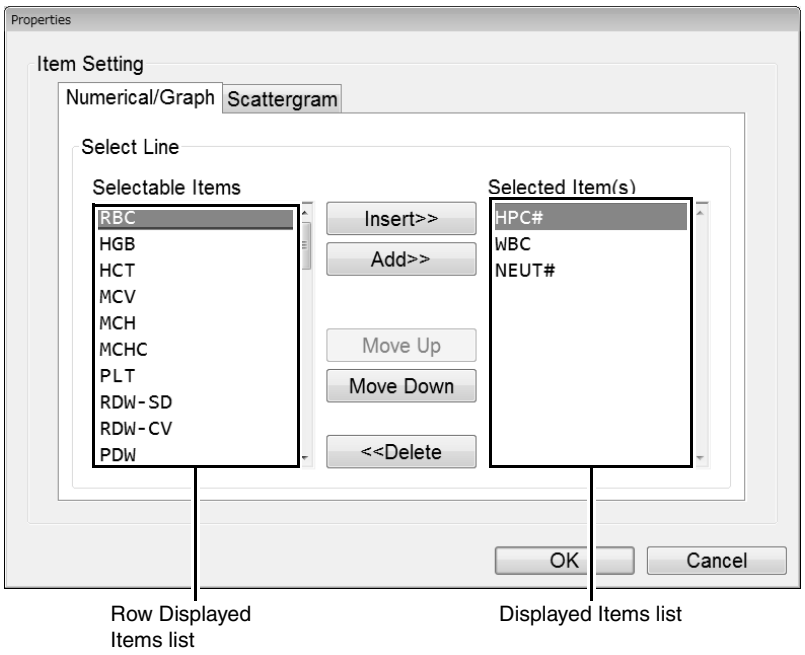
1 Right click on the tab or the analysis data list of the [HPC] screen.

A context menu opens.

2 Click the item you wish to change.

You can populate the displayed fields.

● **[Property]**
The following dialog box appears.



Displayed Item Settings

[Selectable Items]	Displays the items that can be set as row items and all items for research*.
[Selected Item(s)]	The items in this list will be displayed in the analysis data list as row displayed items.
[Insert]	Click to move the selected item from Row Displayed Items list to the Items list, above the selected item.
[Add]	Click to move the item you selected in the Row Displayed Items list to the bottom of the Displayed Items list.
[Move Up]	Click to move up the selection in the Displayed Items list by 1 item.
[Move Down]	Click to move down the selection in the Displayed Items list by 1 item.
[Delete]	Click to move the item you selected in the Displayed Items list to the bottom of the Row Displayed Items list.

* To display the items for research, the IPU setting is required. For details, see "Administrator's Guide". (➤Administrator's Guide "Chapter 4: 4.3.2 System settings") And, the items for research are displayed on gray background.

● **[Backup]**

Click to display the [Open] dialog box. Enter a file name and click [OK] to save the layout.
The file extension is ".hlf".

> **Note:**
> The default file name is set to [XN][software version][HPC Layout Files].hlf.

● **[Restore]**

Click to display the dialog box. Select a file name and click [OK] to restore a layout. The file extension is ".hlf".

● **[Initialize]**

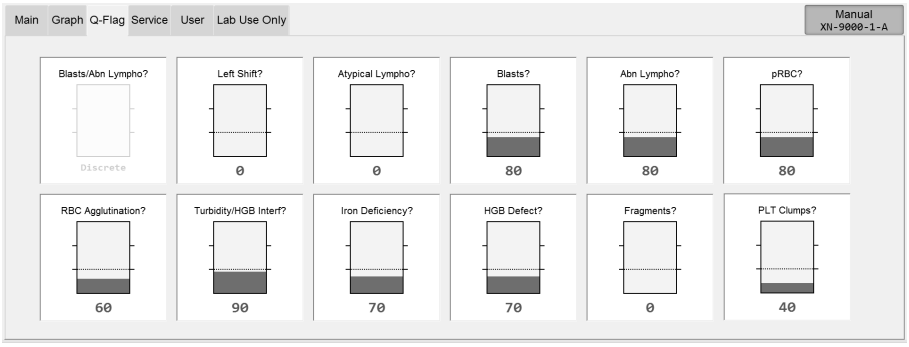
Click to display the dialog box for confirming reset the layout to factory setting. Click [Yes] to have the layout initialized.

3 Click [OK].

The dialog box closes, and the layout of the analysis data list changes.

11.3 Check data by Q-Flag

The [Q-Flag] screen displays the Positive/Negative levels for 10 types of suspect IP messages, as histograms. The displayed information corresponds to the sample you selected in the analysis data list of the [Sample Explorer] screen.
Clicking the [Q-Flag] tab displays the following screen.



● Suspect IP messages

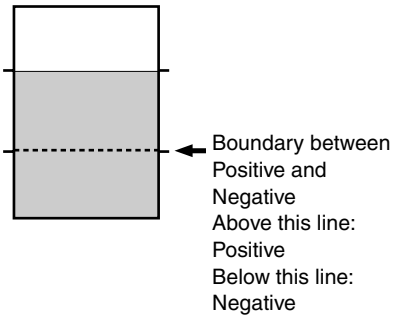
For the details on IP message judgment conditions and judgment methods, see the following.
(➤**P.11-21** "11.5.1 IP message judgment conditions and judgment methods")

Q-Flag	Message	Meaning
WBC type	**[Blasts/Abn Lympho?]**	Possibility of blasts or abnormal lymphocytes
	[Blasts?]*1	Possibility that blasts are present
	[Left Shift?]	Possibility of left shift
	[Abn Lympho?]*1	Possibility abnormal lymphocytes
	[Atypical Lympho?]	Possibility of atypical lymphocytes
RBC type	**[RBC Agglutination?]**	Possibility of RBC agglutination
	[Turbidity/HGB Interf?]	Possibility of HGB interference by chylemia
	[Iron Deficiency?]	Possibility of iron deficiency anemia
	[HGB Defect?]	Possibility of HGB abnormality
	[Fragments?]	Possibility of fragmented RBCs
	[pRBC?]*2	Possibility of parasite-infected RBCs*4
PLT type	**[PLT Clumps?]*3**	Possibility of PLT clumps

*1 These items do not appear with all analyzer types.
*2 The availability of this function depends on your system configuration.
*3 The judged channel (WNR/WDF/PLT-F) is appended to the IP message.
*4 The flag indicates that red blood cell may be infected with either P. vivax or P. malariae – trophozoite, schizont and gametocyte stages. This is only a suspect flag and NOT definitive or specific for malaria infection.

● **[Q-Flag]**

In the histogram, Negative results of the sample are displayed in green, and Positive results are displayed in red.
The values are displayed below the histogram. These values range from 0 to 300, in increments of 10. Values over 100 are determined as Positive.



In addition, the following may appear in the judgment value position. Nothing is displayed on the bar graph.

[Discrete]: Displayed in gray text. If the parameter used for judgment has not been analyzed.
[Error]: If judgment impossible.
Blank: If prerequisite for judgment was not met. Also, if the suspect judgment was not performed due to blank data, etc.

11.4 Change layout of screen

You can change the layout for [User] and [Lab Use Only] screens.

[User] screen

This screen allows the user to set any layout. Items that can be set are reportable items on your analyzer.
This appears when the [User] tab is clicked.

[Lab Use Only] screen

This screen allows the user to set any layout. Items that can be set are reportable items on your analyzer and research items*.
This appears when the [Lab Use Only] tab is clicked.

* Research items only appear when the user has permission for [Display and Output of Research Items]. For details on permission for [Display and Output of Research Items], see the "Administrator's Guide". (➤Administrator's Guide, "Chapter 4: 4.3.2 System settings")

When you right-click on the screen, a menu is displayed, allowing you to change the settings. The items you can configure change according to what part of the screen you right-click.

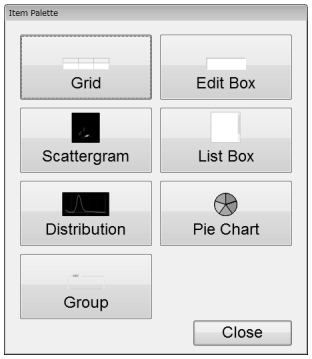
Right-clicking on the desired display-switching button:

The following context menus are displayed.

[Change Name]	Click to display the dialog for renaming the button. Up to 12 characters can be entered.
[Layout backup]	Clicking this item opens the [Save As] dialog box. Enter a file name and click [Save] to save the screen layout that is currently displayed. The file extension is ".blf". The default file name is set to [XN][software version][BrowserLayout].blf.
[Layout restore]	Clicking this item opens the [Open] dialog box. You can restore a screen layout. The file extension is ".blf". Select a file and click [Open] to display the overwrite confirmation dialog box. Clicking [OK] overwrites the screen layout and the dialog box closes.
[Layout initialize]	Click to display the dialog box for confirming reset the layout of the screens to factory setting. Click [Yes], you can reset the layout of the screens that is currently displayed to factory setting.

Right-clicking inside the desired screen:

[Add Item]	Click to display the dialog box on the right. Clicking a button places the item on the screen. A table, a scattergram, a list box, a distribution, or a pie chart can be placed. Simultaneously, a setting dialog box for each item is displayed. Displayed item, name, color, types of scattergram and distribution, and types of IP message, error/rule comment and action can be set.



Right-clicking on an item in the screen:

[Move]	Click this menu selects the right-clicked item, and its coordinates appear on the top right corner of the screen. In this state, you can drag to move the item to any position. Moreover, you can resize the item by dragging its vertex or one of the four corners. **Displayed Item of coordinates** [X]: The horizontal coordinate of the top left corner of the item, with the top left corner of the screen as the origin. [Y]: The vertical coordinate of the top left corner of the item, with the top left corner of the screen as the origin. [W]: The length of the item. [H]: The height of the item. [x]: The horizontal coordinate of cursor, with the top left corner of the screen as the origin. [y]: The vertical coordinate of cursor, with the top left corner of the screen as the origin.
[Delete]	Click to delete the selected item.
[Properties]	Click to display the Property dialog box for the selected item. You can configure its advanced settings of following items from this dialog box.
[Grid]	You can set items ([Item], [Data], [Unit] and [LL UL]) and analysis items to display in a table. The items for research can be set to display*.
[Text Box]	You can specify the analysis parameters, units, and display data to display. In addition, you can set the font and background colors for entering free text. The items for research can be set to display*.
[Scattergram]	You can specify the type of scattergram you want to display.
[List Box]	You can specify the type of IP messages, the list of Error / Rule comment and the display of action comment you want to display.
[Distribution]	You can specify the type of distribution and normal range you want to display.
[Pie Chart]	You can set the analysis items you want to display in the pie chart and their colors.
[Group]	You can specify the group name for each item you want to display.

* To display the items for research, the IPU setting is required. For details, see "Administrator's Guide". (➤Administrator's Guide, "Chapter 4: 4.3.2 System settings") And, the items for research are displayed on gray background.

11.5 IP Messages

When analysis data is analyzed in the IPU, information that supplements the Positive/Negative sample judgment appears in the [Data Browser] screen.
Results without an error messages are classified into Positive/Negative based on the preset criteria. The system bases its judgments on comprehensive surveys of numerical data, particle size distributions, scattergrams, and provides easily-to-understand flags/messages indicating the instruments findings. These flags/messages are referred to as "IP (Interpretive Program) messages."
IP messages appear on the sample information tab of the [Sample Explorer] screen, on the main tab of the [Data Browser] screen, and the flag display area of the graph tab.

Caution!

- A "Positive" or "Error" judgment indicates the possibility of an abnormality. It is not a diagnosis of the patient. If a "Positive" or "Error" judgment occurs, check the data and repeat the test or examine carefully in accordance with the protocol of your laboratory.
- IP Messages are only intended for use in the clinical laboratory and are not for patient diagnosis. IP messages provide notification of the possibility of a specific sample abnormality based on examination of the analysis data.

The main tab of [Data Browser] screen

● Flag categories

[WBC Flag(s)]	Shows IP message(s) for WBC. [NRBC Present] flag are also shown in here [WBC Flag(s)].
[RBC Flag(s)]	Shows IP message(s) for RBC/RET.
[PLT Flag(s)]	Shows IP message(s) for PLT.

● Message types

There are 2 types of IP messages, abnormal message and suspect message, that may be displayed for each of WBC, RBC/RET, and PLT.

Abnormal message	Indicates that the sample is clearly abnormal. With some exceptions, the criteria for abnormal message judgment can be preset.
Suspect message	Indicates a possibility that the sample is abnormal.

● Positive/Negative judgment

[Positive]	Indicates that an analysis value or cell morphology exceeds the preset criteria for the IP message (abnormal sample). Displayed on a red background. A Positive judgment is classified into the 3 types shown below. The type appears to the right of [Positive].
[Diff.]	Indicates an abnormal blood cell differentiation value.
[Morph.]	Indicates abnormal cell morphology.
[Count]	Indicates an abnormal blood cell count.
[Negative]	Indicates that there was no analysis error or abnormality, and that there is no IP message (normal sample). Displayed on a green background.

Note:

Only "Positive" judgment is performed for analysis in [Pre-Dilution] / [Body Fluid] / [HPC] mode.

With respect to the following IP messages, when a sample judgment is Positive, the analysis results are regarded as having low reliability due to the abnormality and "*" (or "----") appears to the right of the data.

WBC IP messages

	WBC	NRBC# NRBC%	NEUT# NEUT%	LYMPH# LYMPH%	MONO# MONO%	EO# EO%	BASO# BASO%	IG# IG%	WBC-BF TC-BF# PMN#, PMN% MN#, MN%
WBC Abn Scattergram									
Lymph, Mono(WDF)				*	*				
Neut, Eo(WDF)			*			*		*	
Lymph, Neut(WDF)			*	*				*	
Neut, Mono(WDF)			*		*			*	
Lymph, Baso(WDF)			*	*				*	
Lymph, Eo(WDF)				*		*			
Mono, Eo(WDF)					*	*			
Mono, Baso(WDF)			*		*			*	
Ghost, Neut(WDF)	*[*2]	*[*2]	*	*	*	*	*[*2]	*	
Ghost, Baso(WDF)	*[*2]	*[*2]	*	*	*	*	*[*2]	*	
Ghost, Lymph(WDF)	*[*2]	*[*2]	*	*	*	*	*[*2]	*	
Ghost, Eo(WDF)	*[*2]	*[*2]	*	*	*	*	*[*2]	*	
Ghost, WBC(BF)[*3] Ghost or other interference with WBC in body fluid analysis									*
4DIFF, Baso(WNR)			*				*	*	
4DIFF, Nrbc(WNR)	*[*1]	*	*	*	*	*	*	*	
Ghost, 4DIFF(WNR)	*[*1]	*	*	*	*	*	*	*	
Ghost, Nrbc(WNR)	*[*1]	*	*	*	*	*	*	*	
WBC calculation not possible(WNR)	----[*1]	----	----[*1]	----[*1]	----[*1]	----[*1]	----[*1]	----[*1]	
5DIFF data calculation not possible			----	----	----	----	----	----	
IG fraction								*	
HF-BF high value									
NRBC Present									
Blasts/Abn Lympho?			*	*	*				
Blasts?[*4]			*	*	*				
Abn Lympho?[*4]			*	*	*				
Left Shift?			*			*			
Atypical Lympho?			*	*	*				

*1 WBC in the WNR channel.
*2 WBC in the WDF channel.
*3 The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.
*4 These messages do not appear with all analyzer types.

RBC/RET IP messages

		RBC RET# HCT MCV MCH MCHC	HGB MCH MCHC	RDW-SD	RDW-CV	RET# RET% IRF LFR MFR HFR	PLT	RET-He
RBC Abn Distribution								
	MP-Flag	*		----	----			
	Abnormal RDW-SD	*		----	*			
	Other abnormal distribution	*		*	*			
Dimorphic Population				----	----			
RET Abn Scattergram*1								
	RET abnormal fraction (Deformation)					*	*2	*
	Other than above (RET zone error)					*		*
	Foreign particles mixed in PLT zone (High impact)						----*2	
	Foreign particles mixed in PLT zone						*2	
RBC Agglutination?		*						
Turbidity/HGB Interf?			*					
Iron Deficiency?								
HGB Defect?								
Fragments?								
pRBC?*3								

*1 This message does not appear with all analyzer types.

*2 PLT in the RET channel.

*3 The availability of this function depends on your system configuration.

PLT IP messages

		PLT	PDW MPV P-LCR PCT	IPF
PLT Abn Distribution				
	Abnormal PDW		----	
	Other abnormal distribution		*	
PLT Abn Scattergram*4		*3		*
PLT Clumps?				
	PLT-F not analyzed	*1, 2	*	
	PLT-F analyzed	*3	*	*

*1 PLT in the PLT channel.

*2 PLT in the RET channel.

*3 PLT in the PLT-F channel.

*4 This message does not appear with all analyzer types.

11.5.1 IP message judgment conditions and judgment methods

In the following cases, IP message judgment are not performed.

- QC analysis data
- Blank data
- Background check data
- Insufficient blood volume
- Adjustment

● Blank data

Blank data is data that meets all of the following conditions:

- WBC < 1.00 x 10^3/µL
- RBC < 0.30 x 10^6/µL
- HGB < 1.0 g/dL
- PLT < 20 x 10^3/µL

● Judgment method

WBC < 0.50 x 10^3/µL	The judgment for WBC suspect message ([Left Shift?]) is not performed. (In [Pre-Dilution] mode, when WBC < 0.20 x 10^3/µL)
RBC < 0.50 x 10^6/µL	IP message judgment for RBC other than [RBC Abn Distribution] is not performed. This is displayed as [RBC Abn Distribution], even if the analysis of RBC was not indicated.

- If an error or other condition prevents an analysis item necessary for judgment from being calculated ("----" or "++++" appears), judgments that include that analysis item will not be performed.
- Items for which the user has not specified that analysis be performed (blank " ") are not used for judgment.

● [Pre-Dilution] / [Body Fluid]* / [HPC]* mode

For IP messages judged in analysis of [Pre-Dilution] / [Body Fluid] / [HPC]* mode, see the following.
(➤**P.11-25** "11.5.2 Table of IP message details")
Only Positive judgment is performed; Negative judgment is not performed.

* The availability of these functions depends on your system configuration.

IP message types, meanings, and judgment methods

You can change the judgment values of the IP message in the setting. For details, see "Administrator's Guide". (➤Administrator's Guide, "Chapter 4: 4.2.6 Flag settings")

WBC IP messages

Message	Meaning	Judgment method/equation
Abnormal messages		
WBC Abn Scattergram	Abnormal WBC scattergram	Based on clustering in WNR and WDF scattergrams. For body fluid analysis, based on clustering in the WDF scattergram and the HF-BF value.
Neutropenia	Low neutrophil count	NEUT# < 1.00 x 10^3/µL or NEUT% < 0.0 %
Neutrophilia	High neutrophil count	NEUT# > 11.00 x 10^3/µL or NEUT% > 100.0 %
Lymphopenia	Low lymphocyte count	LYMPH# < 0.80 x 10^3/µL or LYMPH%< 0.0 %
Lymphocytosis	High lymphocyte count	LYMPH# > 4.00 x 10^3/µL or LYMPH% > 100.0 %
Monocytosis	High monocyte count	MONO# > 1.00 x 10^3/µL or MONO% > 100.0 %
Eosinophilia	High eosinophil count	EO# > 0.70 x 10^3/µL or EO% > 100.0 %
Basophilia	High basophil count	BASO# > 0.20 x 10^3/µL or BASO% > 100.0 %
Leukocytopenia	Low leukocyte count	WBC < 2.50 x 10^3/µL
Leukocytosis	High leukocyte count	WBC > 18.00 x 10^3/µL
NRBC Present	High nucleated RBC count	NRBC% > 2.0 %
IG Present	Increased immature granulocyte	IG# > 0.10 x 10^3/µL or IG% > 100.0 %
Suspect messages		
Blasts/Abn Lympho?	Possibility that blasts are present/ Possibility of abnormal lymphocytes	Judged from the presence of Blasts/ Abn Lympho on the WDF scattergram.
Blasts?*	Possibility that blasts are present	Judged from the presence of Blasts on the WDF and WPC scattergrams.
Abn Lympho?*	Possibility of abnormal lymphocytes	Judged from the presence of Abn Lympho on the WDF and WPC scattergrams.
Left Shift?	Possibility of left shift	Based on the distribution state of the upper right area of the NEUT in the WDF scattergram.

Message	Meaning	Judgment method/equation
Atypical Lympho?	Possibility of atypical lymphocytes	Based on the distribution state of the upper area of the lymphocytes in the WDF scattergram.

* WPC+WDF channel only. These messages do not appear with all analyzer types.

RBC/RET IP messages

Message	Meaning	Judgment method/equation
Abnormal messages		
RBC Abn Distribution	Abnormal RBC distribution	Judged from RBC distribution.
Dimorphic Population	Double-peak RBC distribution	Gap between the high and low points and shape of distribution peak.
RET Abn Scattergram*1	Abnormal RET scattergram	Clustering in the RET scattergram
Reticulocytosis*1	Reticulocytosis	RET% > 5.00% or RET# > 0.2000 x 10^6/µL
Anisocytosis	Anisocytosis	RDW-SD > 65.0 fL or RDW-CV > 20.0%
Microcytosis	Microcytosis	MCV < 70.0 fL
Macrocytosis	Macrocytosis	MCV > 110.0 fL
Hypochromia	Hypochromia	MCHC < 29.0 g/dL
Anemia	Anemia	HGB < 10.0 g/dL
Erythrocytosis	Erythrocytosis	RBC > 6.50 x 10^6/µL
Suspect messages		
RBC Agglutination?	Possibility of RBC agglutination	Judged from RBC and RBC distribution.
Turbidity/HGB Interf?	Possibility of effect on HGB by chylemia	Judged from hemoglobin related parameters.
Iron Deficiency?	Possibility of iron deficiency	Judged from RBC distribution and hemoglobin related parameters.
HGB Defect?	Possibility of HGB abnormality	Judged from RBC distribution related parameters.
Fragments?	Possibility of fragmented red blood cells	Judged from RBC distribution, PLT distribution and RET scattergram.
pRBC?*2	Possibility of parasite-infected RBCs	Judged from the WNR and WDF scattergrams.

*1 These messages do not appear with all analyzer types.

*2 The availability of this function depends on your system configuration.

PLT IP messages

Message	Meaning	Judgment method/equation
Abnormal messages		
PLT Abn Distribution	Abnormal PLT distribution	Judged from PLT distribution.
PLT Abn Scattergram*	Abnormal PLT scattergram	PLT clustering in the PLT scattergram
Thrombocytopenia	Thrombocytopenia	PLT# < 60 x 10^3/µL
Thrombocytosis	Thrombocytosis	PLT# > 600 x 10^3/µL
Suspect messages		
PLT Clumps?	Possibility of PLT clumps	Judged from the presence of PLT Clumps on the WNR, WDF and PLT-F scattergrams.

* These messages do not appear with all analyzer types.

11.5.2 Table of IP message details

	Message	No.*1	Flag category of Positive/Negative judgment	Detection channel	Analysis Mode			Target table of flag judgment to discrete test					
					[Pre-Dilution]	[Body Fluid]*2	[HPC]*2	CBC	CBC+DIFF	CBC+DIFF +RET	CBC+RET	CBC+DIFF +WPC	CBC+DIFF +RET+WPC	+PLT-F
WBC	Abnormal messages	WBC Abn Scattergram	1	Morph.	WNR, WDF	○	○	○	△	○	○	△	○	○	----
		Neutropenia	2	Diff.	WDF	○	×	○	×	○	○	×	○	○	----
		Neutrophilia	3	Diff.	WDF	○	×	○	×	○	○	×	○	○	----
		Lymphopenia	4	Diff.	WDF	○	×	○	×	○	○	×	○	○	----
		Lymphocytosis	5	Diff.	WDF	○	×	○	×	○	○	×	○	○	----
		Monocytosis	6	Diff.	WDF	○	×	○	×	○	○	×	○	○	----
		Eosinophilia	7	Diff.	WDF	○	×	○	×	○	○	×	○	○	----
		Basophilia	8	Diff.	WNR	○	×	○	×	○	○	×	○	○	----
		Leukocytopenia	9	Count.	WNR, WDF	○	×	○	○	○	○	○	○	○	----
		Leukocytosis	A	Count.	WNR, WDF	○	×	○	○	○	○	○	○	○	----
		NRBC Present	E	Morph.+Count.	WNR	○	×	○	○	○	○	○	○	○	----
		IG Present	F	Morph.+Count.	WDF	○	×	○	×	○	○	×	○	○	----
	Suspect messages	Blasts/Abn Lympho?	7	Morph.	WDF	×	×	○	×	○	○	×	×	×	----
		Blasts?*3	1	Morph.	WDF+WPC	×	×	×	×	×	×	×	○	○	----
		Abn Lympho?*3	A	Morph.	WDF+WPC	×	×	×	×	×	×	×	○	○	----
		Left Shift?	3	Morph.	WDF	×	×	×	×	○	○	×	○	○	----
		Atypical Lympho?	4	Morph.	WDF, WDF+WPC	×	×	○	×	△	△	×	○	○	----
RBC/RET	Abnormal messages	RBC Abn Distribution	1	Morph.	RBC	△	×	○	○	○	○	○	○	○	----
		Dimorphic Population	2	Morph.	RBC	×	×	○	○	○	○	○	○	○	----
		RET Abn Scattergram*3	9	Count.	RET	×	×	○	×	○	○	○	×	○	----
		Reticulocytosis*3	A	Count.	RET	○	×	○	×	×	○	○	×	○	----
		Anisocytosis	3	Morph.	RBC	○	×	○	○	○	○	○	○	○	----
		Microcytosis	4	Morph.	RBC	○	×	○	○	○	○	○	○	○	----
		Macrocytosis	5	Morph.	RBC	○	×	○	○	○	○	○	○	○	----
		Hypochromia	6	Morph.	RBC+HGB	○	×	○	○	○	○	○	○	○	----
		Anemia	7	Count.	HGB	○	×	○	○	○	○	○	○	○	----
		Erythrocytosis	8	Count.	RBC	○	×	○	○	○	○	○	○	○	----
	Suspect messages	RBC Agglutination?	1	Count.	RBC+HGB	×	×	○	○	○	○	○	○	○	----
		Turbidity/HGB Interf?	2	Count.	RBC+HGB	×	×	○	○	○	○	○	○	○	----
		Iron Deficiency?	3	Morph.	RBC+HGB	×	×	○	○	○	○	○	○	○	----
		HGB Defect?	4	Morph.	RBC	×	×	○	○	○	○	○	○	○	----
		Fragments?	5	Morph.	RBC, PLT, RET	×	×	○	△	△	○	○	△	○	----
		pRBC?*2	6	Morph.	WNR, WDF	○	×	○	○	○	○	○	○	○	----
PLT	Abnormal messages	PLT Abn Distribution	1	Morph.	PLT	×	×	○	○	○	○	○	○	○	----
		PLT Abn Scattergram*3	4	Count.	PLT-F	○	×	○	×	×	×	×	×	×	○
		Thrombocytopenia	2	Count.	PLT, RET, PLT-F	○	×	○	○	○	○	○	○	○	○
		Thrombocytosis	3	Count.	PLT, RET, PLT-F	○	×	○	○	○	○	○	○	○	○
	Suspect message	PLT Clumps?	1	Count.	WNR, WDF, PLT-F	×	×	○	△	△	△	△	△	△	△

○: Judgment enabled. (For WBC Abn Scattergram, body fluid mode and other modes are judged with different rules.)
△: Partial judgment enabled. (Rules that use channels that are not analyzed are not judged.)
×: Judgment disabled.
*1 Message in the Explorer screen (Flag No.)
*2 The availability of these functions depends on your system configuration. *3 These messages do not appear with all analyzer types.

Chapter 12 Performing Calibration

This chapter explains how to perform calibration.

12.1 Introduction

Calibration is performed to ensure accuracy of the system.

About calibration

For this instrument, you can use a dedicated calibrator to calibrate the instrument (calibrator calibration).
The instrument automatically analyzes the same calibrator 11 times consecutively, and the repeatability and accuracy of the analysis parameters are checked.
At the same time, the compensation rate can be updated.

There are 2 types of calibrator calibration, as follows.

- Calibrator calibration: Calibration of parameters other than PLT-F
- Calibrator calibration (PLT-F)*: Calibration of PLT-F

The calibrator used for each calibration is different.

* Calibration cannot be used with all analyzer types.

In addition, precision check function is available for checking only the instrument's repeatability by using a normal sample.

Note:

For calibrator calibration and precision check, please note the following.

- Repeat, Rerun, and Reflex are not performed.
  (➤Administrator's Guide, "Chapter 2: 2.1 Types of rules")
- Identification of samples by barcode reader is not performed.
  The following sample numbers are automatically assigned by the analyzer.
  - Calibrator calibration: CAL-CAL-01 to CAL-CAL-11
  - Calibrator calibration (PLT-F): PF-CAL-CAL-01 to PF-CAL-CAL-11
  - Precision check: PRE-CHK-01 to PRE-CHK-11

Before Performing Calibration

Before performing calibration, check the remaining amount of the reagent connected to the instrument.
If the reagent runs out, the calibration stops.
If it stops, cancel the calibration. After replacing the reagent, restart the operation from the beginning.

12.1.1 Calibration practice standards

The initial calibration is done by your Sysmex technical representative, at the time of installation.
Perform calibration as needed, e.g., when the QC data is fluctuating. However, if the abnormality in the QC analysis data was caused by an error in the analyzer, degradation of the reagent, or degeneration of the control blood, do not perform calibration.

12.1.2 Calibrators and samples to be used

Use the following calibrators and samples for calibrator calibration and precision check.

Calibrator calibration

XN CAL: Use for the calibration of the analyzer for WBC, RBC, HGB, HCT, PLT, and RET.

Calibrator calibration (PLT-F)

XN CAL PF: Use for the calibration of the analyzer for PLT-F (Platelet count analyzed by the PLT-F channel).

Precision check

For precision check, use one sample of fresh normal blood per analyzer that meets the following requirements.

- Blood of a healthy person who is not taking any medicine;
- Blood added with an appropriate amount of anticoagulant;
- Whole blood volume in each sample is at least 2.5 mL.

Information

Control blood is not suitable for calibrator calibration. Control blood is intended for quality control, not for calibration.

12.2 About Calibrator Calibration

Calibrator calibration is performed by manual analysis.
The discrete tests to be analyzed are specified automatically, and cannot be changed. In addition, different discrete tests are specified depending on the type of analyzer that is connected. See below for details:

Discrete test

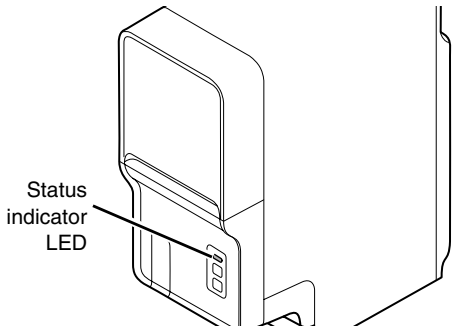
Analyzer	Discrete test	
	Calibrator calibration	Calibrator calibration (PLT-F)
XN-20[A1]	CBC+DIFF+RET+WPC	CBC+PLT-F
XN-20[A2]	CBC+DIFF+RET+WPC	-
XN-10[B1]	CBC+DIFF+RET	CBC+PLT-F
XN-10[B2]	CBC+DIFF	CBC+PLT-F
XN-10[B3]	CBC+DIFF+RET	-
XN-10[B4]	CBC+DIFF	-

12.2.1 Performing Calibrator Calibration

Follow the steps below to perform calibrator calibration for parameters other than PLT-F.

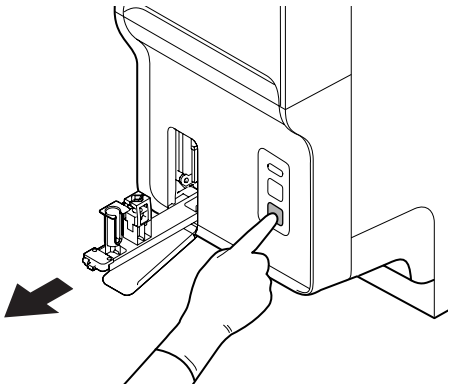
1 Check the Status indicator LED on the analyzer.

If the Status indicator LED is not lit green, wait until it does.



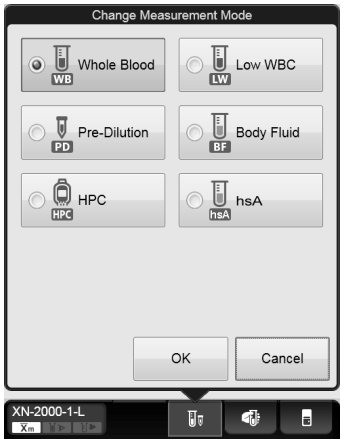
2 If the tube holder has not ejected out, press the mode switch.

The tube holder slides out forward.



3 Click the Change Analysis Mode button on the control menu.

The dialog box on the right appears.
In calibrator calibration, select [Whole Blood] mode.

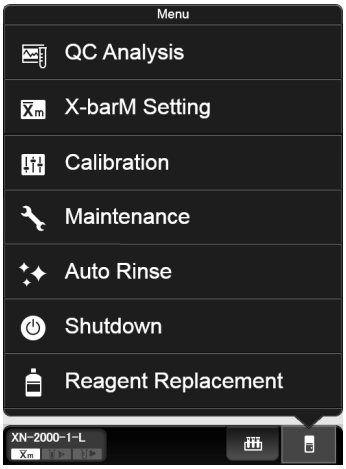


4 Click [OK].

The dialog box closes.

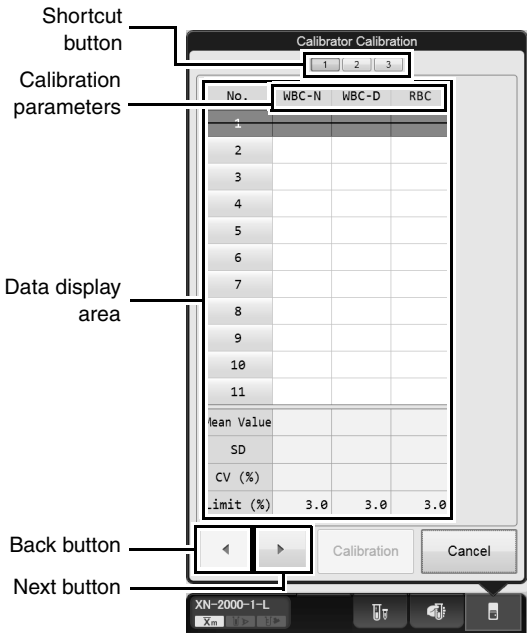
5 Click the Analyzer menu button on the control menu.

The menu on the right appears.



6 Click [Calibration] - [Calibrator Calibration].

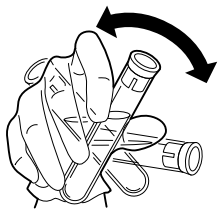
The dialog box on the right appears.



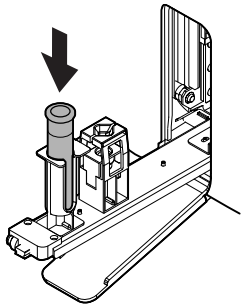
[Calibrator Calibration] analysis dialog box

Shortcut button	Click to display calibration item screens that are not currently displayed. If the data in a screen includes a warning, a warning mark appears.
Data display area	
Calibration parameters	The analysis parameters to be calibrated are displayed. Different parameters are displayed depending on the type of analyzer that is connected.
[No. 1] - [No. 11]	For each calibration parameter, the analysis results are displayed for the 11 repeated analysis cycles. A strike-through is displayed for the results for [No. 1] since it is not reflected in [Mean Value], [SD], and [CV(%)].
[Mean Value]	For each calibration parameter, the mean value of the analyzed values from [No.2] to [No.11] is displayed.
[SD]	For each calibration parameter, the standard deviation for the analyzed values from [No.2] to [No.11] are displayed. If the [Mean Value] is 0, [----] is displayed.
[CV (%)]	Displays the coefficient of variation for the analysis result for each calibration parameter. After the 11th analysis is complete, if the coefficient of variation is greater than the [Limit (%)], then it is displayed in white font on red background.
[Limit (%)]	Displays the standard value (acceptable value) for the coefficient of variation of each calibration parameter.
Back button	Click to display the previous screen.
Next button	Click to display the next screen.
[Calibration]	When clicked, the [Calibrator Calibration] data confirmation dialog box is displayed.

7 Mix the vial containing the calibrator as shown.

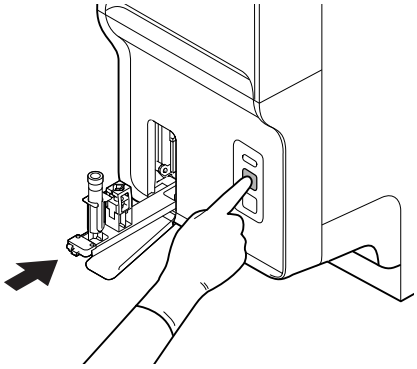


8 Place the vial in the sample tube holder.



9 Press the start switch on the analyzer.

Once the manual analysis starts, the analysis is performed 11 times consecutively, with the tube holder pulled into the analyzer.
Once the analysis finishes, the tube holder slides out.
Wait until all analyses are complete.



Information

If an error occurs during an analysis, and the analysis can no longer continue, stop the calibrator calibration. Once the error is cleared, redo the manual analysis.

10 Redo the manual analysis.

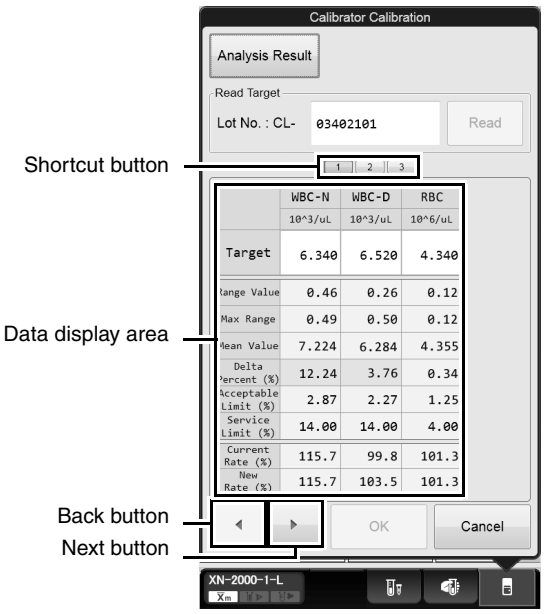
The results from the analysis in step 9 are displayed in the [Calibrator Calibration] analysis dialog box.
When the analysis results do not satisfy the conditions below, the test numbers of tests that must be repeated are displayed in the [Calibrator Calibration] analysis dialog box. Select and redo the manual analysis.

- All analysis results are normal.
- All calibration parameters are below the [Limit (%)] value.

When the analysis results satisfy the conditions, [Calibration] can be clicked in the [Calibrator Calibration] analysis dialog box. Proceed to the next step.

11 Click [Calibration] on the [Calibrator Calibration] analysis dialog box.

The dialog box on the right appears.



[Calibrator Calibration] data confirmation dialog box

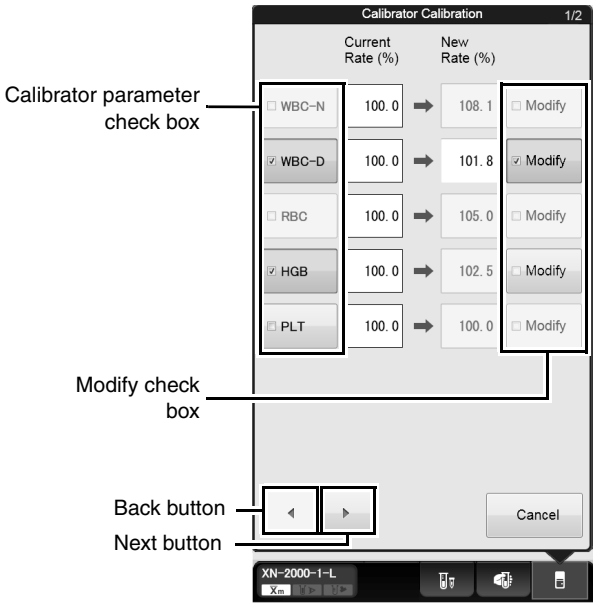
[Analysis Result]	When clicked, the [Calibrator Calibration] analysis dialog box is displayed.
[Read Target]	Use this to read the target value for each calibration parameter from the server.
[Lot No.]	Enter and search the lot number of the calibrator (XN CAL).
[Read]	When clicked, the target value is read.
Shortcut button	Click to display calibration item screens that are not currently displayed. If the data in a screen includes a warning, a warning mark appears.
Data display area	
[Target]	Enter the target value for each calibration parameter. The input methods are as follows. • Referring to the target sheet supplied with the XN CAL, enter the values manually. • Read the target values from the medium supplied with the calibrator.
[Range Value]	Displays the difference between the maximum and the minimum values for each calibration parameter. If this is greater than the maximum range, it is displayed in white font on red background.
[Max Range]	When the target value is entered, a value that is equal to "Target value x Fixed ratio for each calibration parameter" is displayed.
[Mean Value]	Displays the average value of the analysis data.
[Delta Percent (%)]	When the target value is entered, a value that is equal to "|Target value - Mean Value|/Mean Value x 100 (%)" is displayed. If this value is greater than the Acceptable Limit and less than the Service Limit, the background is displayed in yellow. If this is greater than the Service Limit, it is displayed in white font on red background.
[Acceptable Limit (%)]	Displays a numeric value for determining whether calibration is necessary. If the Delta Percent is less than this value, no calibration is necessary.

[Service Limit (%)]	Displays the maximum Delta Percent when performing calibrator calibration. If the Delta Percent is greater than this value, calibration cannot be performed for that parameter.
[Current Rate (%)]	Displays the compensation rate for each calibration parameter before calibrator calibration.
[New Rate (%)]	Displays the new compensation rate, which is calculated from "Target value x Current Rate/Mean Value". This value is displayed once [Target] and [Mean Value] are displayed.
Back button	Click to display the previous screen.
Next button	Click to display the next screen.

12 Click [OK].

The dialog box on the right appears*.

* The display will vary depending on the type of analyzer that is connected.



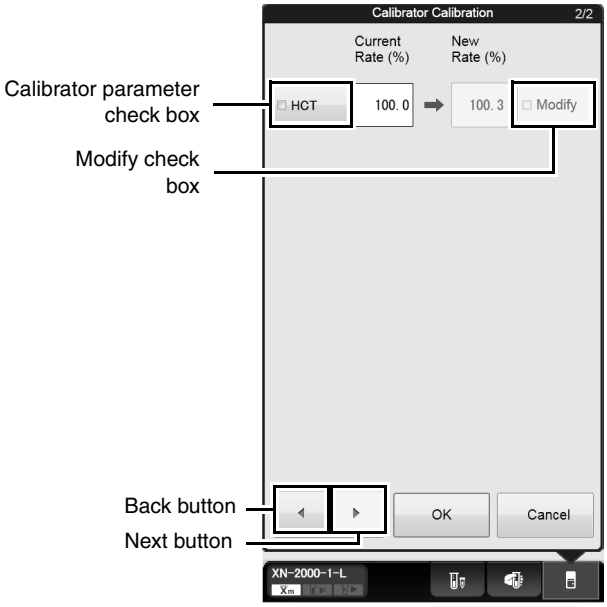
[Calibrator Calibration] execution dialog box

Calibrator parameter check box	Select the check box to include the calibration parameter in the calibrator calibration. Clear the check box to exclude it from calibrator calibration. If a calibration parameter meets all of the conditions below, the check box for that parameter is automatically selected when the screen appears. In addition, you can select or clear the check boxes manually. 1) 80% ≤ New Rate ≤ 120% 2) New Rate - Current Rate ≤ ±5%* 3) Range Value ≤ Max Range 4) Acceptable Limit ≤ Delta Percent ≤ Service Limit If a calibration parameter meets all of the conditions from 1) to 3), and the Delta Percent is less than the Acceptable Limit, it is excluded from calibration, as there is no need for calibration. If a calibration parameter does not meet all of the conditions from 1) to 3) and the Delta Percent is greater than the Acceptable Limit, calibration cannot be performed. Calibration is performed with this calibration parameter excluded. * When the RBC checkbox is selected, condition 2) of HCT changes to "New Rate - Current Rate ≤ ±12.5%".

[Current Rate (%)]	Displays the compensation rate for each calibration parameter before calibrator calibration.
[New Rate (%)]	Displays the new compensation rate calculated by the system.
Modify check box	Selecting the check box enables you to manually enter a value in [New Rate (%)]. You can enter a value within the range of 80 to 120%. However, the check box cannot be selected for any calibration parameter with "Delta Percent > Acceptable Limit". In addition, calibration parameters with manually entered values will be displayed with an asterisk (∗) in the calibrator calibration history. When the check box is cleared, you will not be able to manually enter a value in [New Rate (%)]. Any values that were manually entered prior to clearing the check box will revert to the system-calculated values.
Back button	Click to display the previous screen.
Next button	Click to display the next screen.

13 Click Next button.

The dialog box on the right appears.
The contents of the dialog box are the same as in step 12.



14 Click [OK].

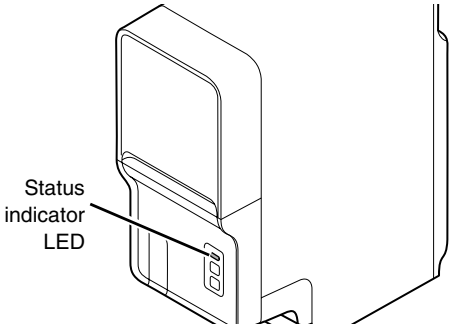
The compensation rates are updated, and this calibration process is logged in the calibrator calibration history.
For details on calibration history, see below.
(➤**P.12-16** "12.3 Manage Calibration History")

12.2.2 Performing calibrator calibration (PLT-F)

Follow the steps below to perform calibrator calibration for PLT-F.
This function may not be available depending on the configuration of the instrument you are using.

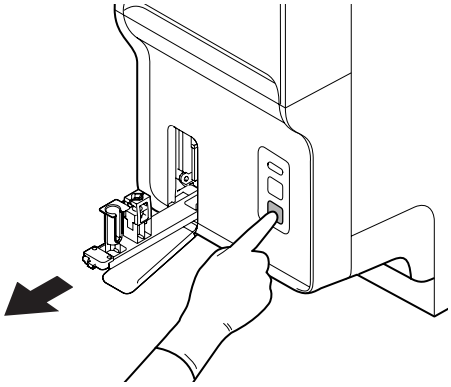
1 Check the Status indicator LED on the analyzer.

If the Status indicator LED is not lit green, wait until it does.



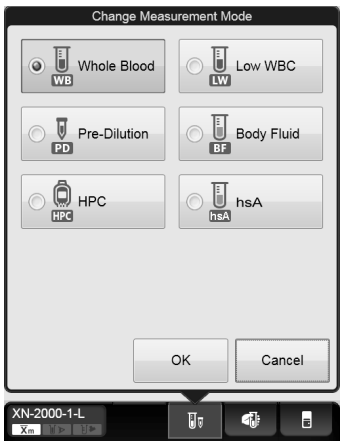
2 If the tube holder has not ejected out, press the mode switch.

The tube holder slides out forward.



3 Click the Change Analysis Mode button on the control menu.

The dialog box on the right appears.
In calibrator calibration (PLT-F), select [Whole Blood] mode.

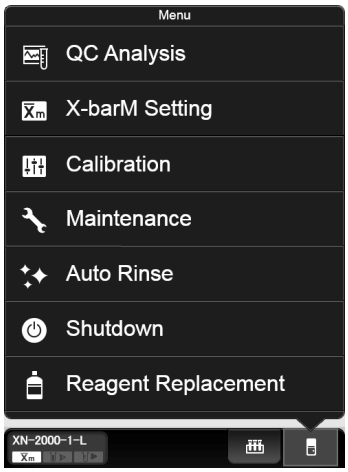


4 Click [OK].

The dialog box closes.

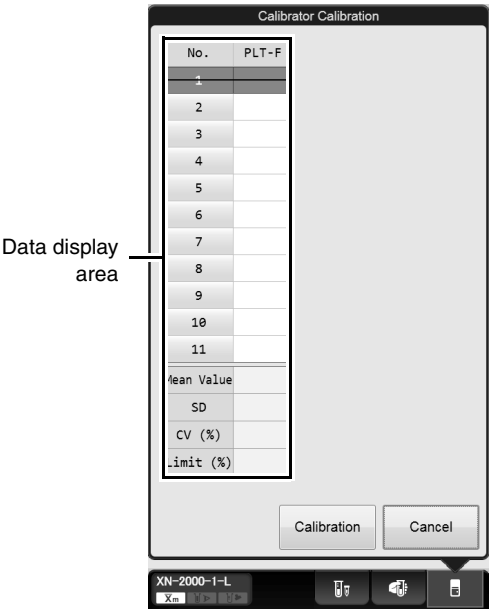
5 Click the Analyzer menu button in the Control menu.

The menu on the right appears.



6 Select [Calibration] - [Calibrator Calibration (PLT-F)].

The dialog box on the right appears.

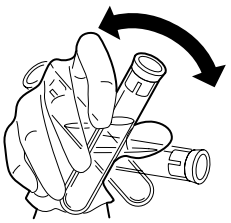


[Calibrator Calibration (PLT-F)] analysis dialog box

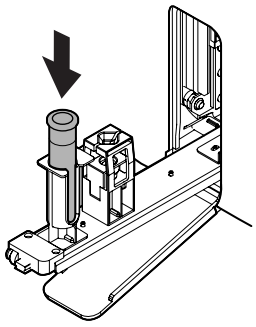
Data display area	
[No. 1] - [No. 11]	The analysis results for PLT-F are displayed for the 11 repeated analysis cycles. A strike-through is displayed for the results for [No. 1] since it is not reflected in [Mean Value], [SD], and [CV(%)].
[Mean Value]	The mean value of the analyzed data from [No.2] to [No.11] is displayed.

[SD]	The standard deviation of the analyzed data from [No.2] to [No.11] is displayed. If the [Mean Value] is 0, "[----]" is displayed.
[CV (%)]	Displays the coefficient of variation for the analysis result. After the 11th analysis is complete, if the coefficient of variation is greater than the [Limit (%)], then it is displayed in white font on red background.
[Limit (%)]	Displays the standard value (acceptable value) for the coefficient of variation of PLT-F.
[Calibration]	When clicked, the [Calibrator Calibration (PLT-F)] data confirmation dialog box is displayed.

7 Mix the vial containing the calibrator as shown.

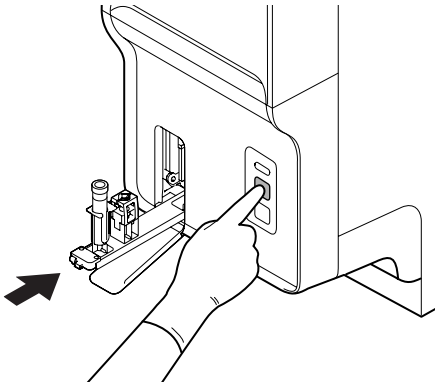


8 Place the vial in the sample tube holder.



9 Press the start switch on the analyzer.

Once the manual analysis starts, the analysis is performed 11 times consecutively, with the tube holder pulled into the analyzer.
Once the analysis finishes, the tube holder slides out.
Wait until all analyses are complete.



Information

If an error occurs during an analysis, and the analysis can no longer continue, stop the calibrator calibration (PLT-F). Once the error is cleared, redo the manual analysis.

10 Redo the manual analysis.

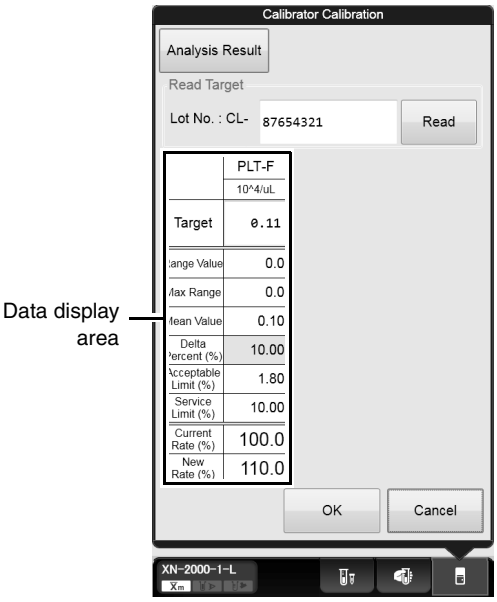
The results from the analysis in step 9 are displayed in the [Calibrator Calibration (PLT-F)] analysis dialog box. When the analysis results do not satisfy the conditions below, the test numbers of tests that must be repeated are displayed in the [Calibrator Calibration (PLT-F)] analysis dialog box. Select and redo the manual analysis.

- All analysis results are normal.
- All calibration parameters are below the [Limit (%)] value.

When the analysis results satisfy the conditions, [Calibration] can be clicked in the [Calibrator Calibration (PLT-F)] analysis dialog box. Proceed to the next step.

11 Click [Calibration] in the [Calibrator Calibration (PLT-F)] analysis dialog box.

The dialog box on the right appears.



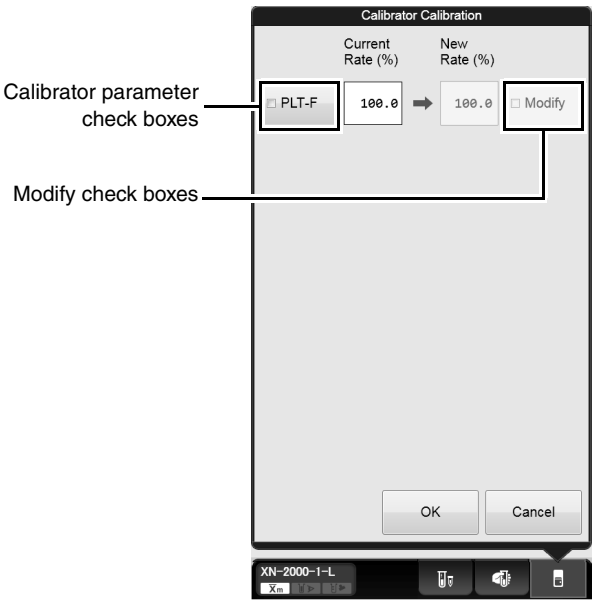
[Calibrator Calibration (PLT-F)] data confirmation dialog box

[Analysis Result]	When clicked, the [Calibrator Calibration (PLT-F)] analysis dialog box is displayed.
[Read Target]	Use this to read the PLT-F target value from the server.
[Lot No.]	Enter and search the lot number of the calibrator (XN CAL PF).
[Read]	When clicked, the target value is read.

Data display area	
[Target]	Enter the target value for PLT-F. The input methods are as follows. • Referring to the target sheet supplied with the XN CAL PF, enter the values manually. • Read the target values from the medium supplied with the calibrator.
[Range Value]	Displays the difference between the maximum and the minimum values of PLT-F. If this is greater than the maximum range, it is displayed in white font on red background.
[Max Range]	When the target value is entered, a value that is equal to "Target value x Fixed ratio for PLT-F" is displayed.
[Mean Value]	Displays the average value of the analysis data.
[Delta Percent (%)]	When the target value is entered, a value that is equal to "|Target value - Mean Value|/Mean Value x 100 (%)" is displayed. If this value is greater than the Acceptable Limit and less than the Service Limit, the background is displayed in yellow. If this is greater than the Service Limit, it is displayed in white font on red background.
[Acceptable Limit (%)]	Displays a numeric value for determining whether calibration is necessary. If the Delta Percent is less than this value, no calibration is necessary.
[Service Limit (%)]	Displays the maximum Delta Percent when performing calibrator calibration (PLT-F). If the Delta Percent is greater than this value, calibration cannot be performed for that parameter.
[Current Rate (%)]	Displays the compensation rate for PLT-F before the calibrator calibration (PLT-F).
[New Rate (%)]	Displays the new compensation rate, which is calculated from "Target value x Current Rate/Mean Value". This value is displayed once [Target] and [Mean Value] are displayed.

12 Click [OK].

The dialog box on the right appears.



[Calibrator Calibration (PLT-F)] execution dialog box

Calibrator parameter check boxes	Select the check box to include the calibration parameter in the calibrator calibration (PLT-F). Clear the check box to exclude it from calibrator calibration (PLT-F). If the conditions below are met, the check box for PLT-F is automatically selected when the screen appears. In addition, you can select or clear the check boxes manually. 1) 80% ≤ New Rate ≤ 120% 2) New Rate - Current Rate ≤ ±5% 3) Range Value ≤ Max Range 4) Acceptable Limit ≤ Delta Percent ≤ Service Limit If all of the conditions from 1) to 3) are met, and the Delta Percent is less than the Acceptable Limit, it is excluded from calibration, as there is no need for calibration. If not all of the conditions from 1) to 3) are not met and the Delta Percent is greater than the Acceptable Limit, calibration cannot be performed.
[Current Rate (%)]	Displays the compensation rate for PLT-F before the calibrator calibration (PLT-F).
[New Rate (%)]	Displays the new compensation rate calculated by the system.
Modify check boxes	Selecting the check box enables you to manually enter a value in [New Rate (%)]. You can enter a value within the range of 80 to 120%. However, the check box cannot be selected if "Delta Percent > Acceptable Limit". In addition, manually entered values will be displayed with an asterisk (∗) in the Calibrator Calibration History. When the check box is cleared, you will not be able to manually enter a value in [New Rate (%)]. Any values that were manually entered prior to clearing the check box will revert to the system-calculated values.

13 Click [OK].

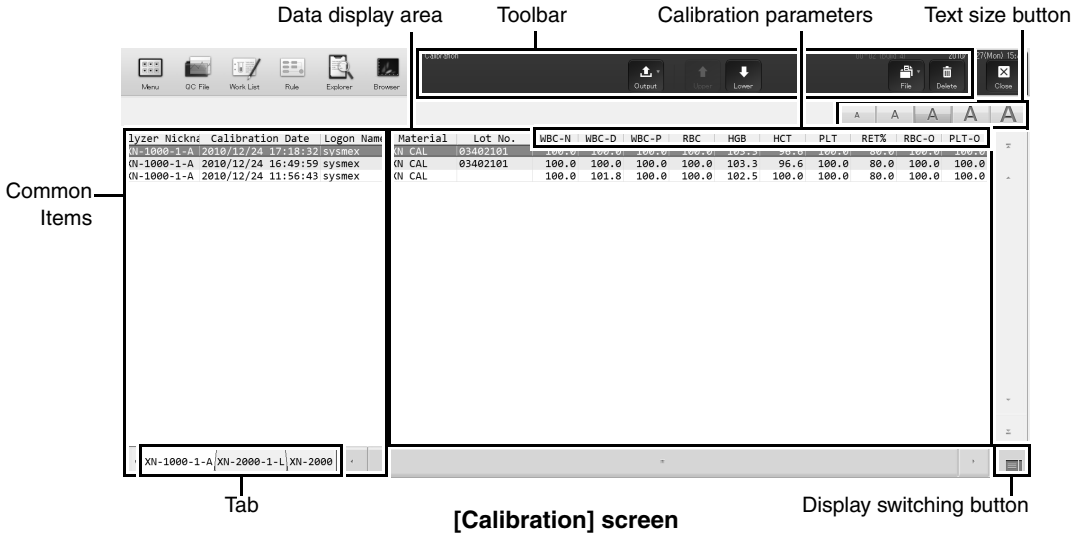
The compensation rates are updated, and this calibration process is logged in the calibrator calibration history. For details on calibration history, see below.
(➤**P.12-16** "12.3 Manage Calibration History")

12.3 Manage Calibration History

Up to 20 records can be saved in the calibrator calibration history per analyzer, and any record after the 20th record overwrites the existing records, starting from the oldest. A calibration history can be displayed, output, saved, restored, and deleted.

12.3.1 Calibration screen

Clicking the [Calibration] icon in the Menu screen displays the following screen.



[Calibration] screen

Toolbar

Displays buttons with the following functions.

[Output]	When clicked, the selected calibration history data is output.
[Upper]	Click to move the selection up by one row.
[Lower]	Click to move the selection down by one row.
[File]	Click to display a submenu that allows you to save and restore data.
[Delete]	When clicked, a dialog box appears that allows you to delete the selected calibration history.

Common Items

[Analyzer Nickname]	Displays the name of the analyzer for which calibration was performed.
[Calibration Date]	Displays the date and time when the calibration was performed.
[Logon Name]	Displays the name of the user who was logged on to the IPU, at the time of calibration.
Tab	Click to switch the display per analyzer, or to display all data together.

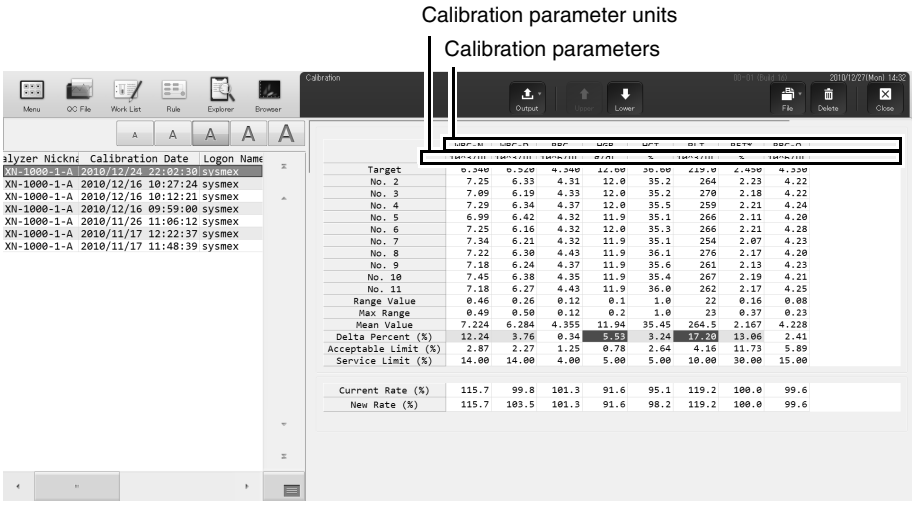
Data display area

The content displayed depends on the type of calibration history. Clicking on a displayed history data switches it.

[Material]	Displays the name of the calibrator. (XN CAL, XN CAL PF)
[Lot No.]	Displays the lot number of the calibrator.
Calibration parameters	The analysis parameters to be calibrated are displayed. Different parameters names are displayed depending on the type of analyzer that is connected.

● Calibrator calibration history

When you click the display switching button, the following screen is displayed. This is the same as parameters displayed in the calibrator calibration (PLT-F) history.



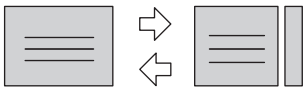
Calibration parameters*	The analysis parameters to be calibrated are displayed.
Calibration parameter units*	Displays the units of the calibration parameters.
[Target]	Displays target values for the calibrator.
[No. 2] - [No. 11]	For each calibration parameter, the analysis results are displayed for the 11 repeated analysis cycles.
[Range Value]	Displays the difference between the maximum and the minimum values of the analysis data. If this is greater than the maximum range, it is displayed on red background.
[Max Range]	Displays a value calculated from the [Target] that was entered.

[Mean Value]	Displays the average value of the analysis data.
[Delta Percent (%)]	A value that is equal to "|Target value - Mean Value|/Mean Value x 100 (%)" is displayed. If this value is greater than the allowed error rate and less than the maximum allowed error rate, the background is displayed in yellow. If this is greater than the maximum allowed error rate, it is displayed on red background.
[Acceptable Limit (%)]	Displays a numeric value for determining whether calibration is necessary.
[Service Limit (%)]	Displays the maximum Delta Percent that allows calibration.
[Current Rate (%)]	Displays the compensation rate for each analysis parameter before calibration.
[New Rate (%)]	Displays the compensation rate for each analysis parameter after calibration. Analysis parameters with an asterisk (*) next to its value are parameters that were manually entered in calibrator calibration.

* The display will vary depending on the type of analyzer that is connected.

Display switching button

Click the display switching button to open and close the sub-screens. A sub-screen is a screen that is displayed to the right of the list of analysis data, that can be opened and closed.



Text size button

Click the text size button to change the size and the line height of the text displayed in the list samples. To change the text size, see the "Administrator's Guide".
(➤Administrator's Guide, "Chapter 4: 4.3.3 Display settings")

Note:

You can select multiple data as follows:
- Drag multiple consecutive rows while holding down the left button on the mouse or.
- While pressing Ctrl, click on the row that you want to select.

12.3.2 Outputting calibration history

You can save and output the data of the selected calibration history as a CSV file, or print to a connected printer as a list (ledger printing).
Follow the steps below to output calibration history.

1 Click the [Calibration] icon in the Menu screen.

The [Calibration] screen appears.

2 Select the calibration history to output.

3 Select the format and output.

● **Outputting in CSV format**

On the toolbar, click the [File] button - [Output in CSV Format], then name and save the file.
The file extension is ".csv".

● **Printing to a Ledger**

On the toolbar, click the [Output] button, and then [Ledger (LP)].

12.3.3 Saving a calibration history (backup)

You can save the calibration history as a file.
Follow the steps below to save the calibration history.

1 Click the [Calibration] icon in the Menu screen.

The [Calibration] screen appears.

2 Select the history you want to save.

3 On the toolbar, click on the [File] button, then click [Backup].

A folder selection dialog box appears, for specifying the folder to which you want to save the file.

4 Select the folder to which you want to save the file.

The file extension is ".cad".
You cannot change the file name.

12.3.4 Restoring a saved calibration history (Restore)

You can restore saved calibration history.
Follow the steps below to restore a saved calibration history.

1 Click the [Calibration] icon in the Menu screen.

The [Calibration] screen appears.

2 On the toolbar, click on the [File] button, then click [Restore].

A dialog box for selecting the file to restore is displayed.

3 Select to open the file you want to restore.

The file extension is ".cad".

Information

In the following cases, the saved history cannot be restored.
- If the history is for a parameter that cannot be analyzed with the analyzer that is connected.
- If a history exists with the same date and time as the history being restored.

12.3.5 Deleting a calibration history

You can delete a calibration history.
Follow the steps below to delete calibration history.

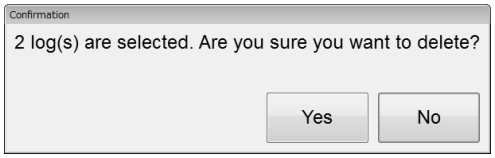
1 Click the [Calibration] icon in the Menu screen.

The [Calibration] screen appears.

2 Select the calibration history to delete.

3 Click the [Delete] button on the toolbar.

The dialog box on the right appears.



4 Click [Yes].

The selected history is deleted.

12.4 Perform a precision check

The precision check is performed by manual analysis. The discrete tests to be analyzed are specified automatically by the system, and cannot be changed. In addition, different discrete tests are specified depending on the type of analyzer that is connected. See below for details:

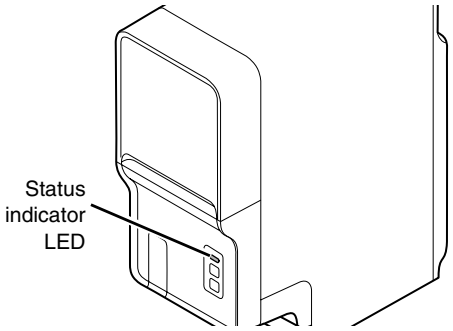
Discrete test

Analyzer	Discrete test
XN-20[A1]	CBC+DIFF+RET+PLT-F+WPC
XN-20[A2]	CBC+DIFF+RET+WPC
XN-10[B1]	CBC+DIFF+RET+PLT-F
XN-10[B2]	CBC+DIFF+PLT-F
XN-10[B3]	CBC+DIFF+RET
XN-10[B4]	CBC+DIFF

Follow the steps below to perform precision calibration.

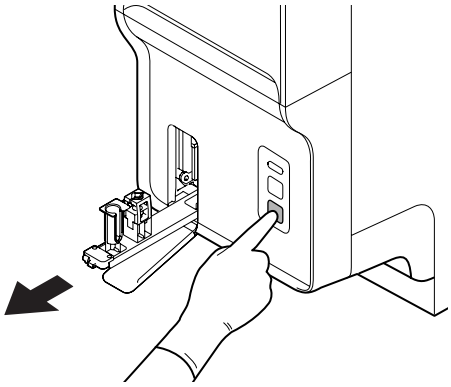
1 Check the Status indicator LED on the analyzer.

If the Status indicator LED is not lit green, wait until it does.



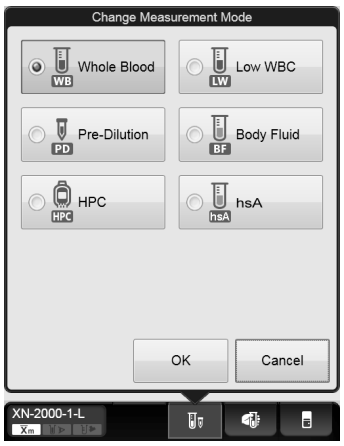
2 If the tube holder has not ejected out, press the mode switch.

The tube holder slides out forward.



3 Click the Change Analysis Mode button on the control menu.

The dialog box on the right appears.
In precision check, select [Whole Blood] mode.

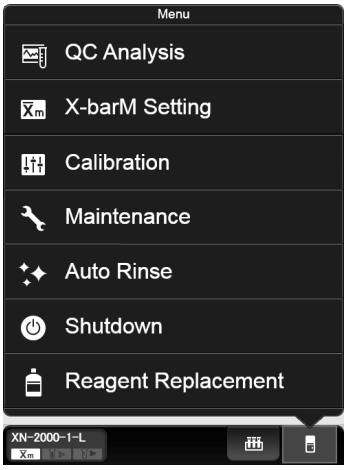


4 Click [OK].

The dialog box closes.

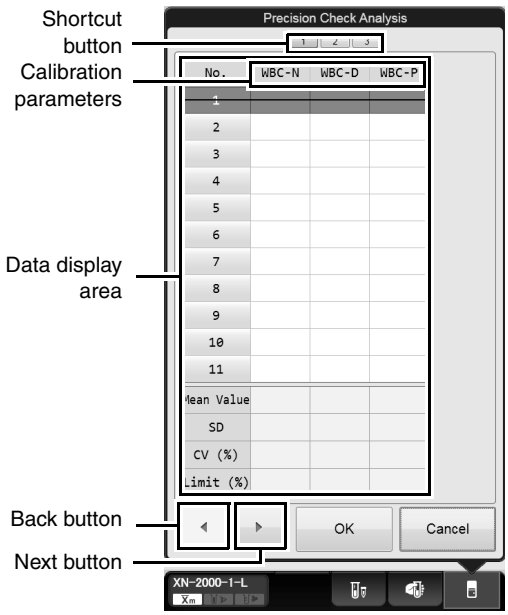
5 Click the Analyzer menu button on the control menu.

The menu on the right appears.



6 Click [Calibration] - [Precision Check].

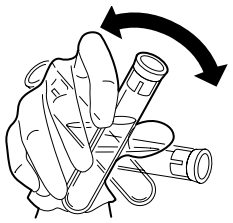
The dialog box on the right appears.



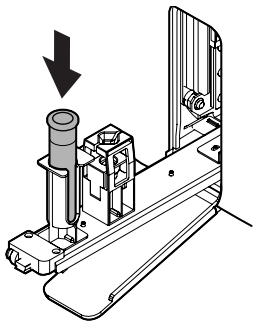
[Precision Check] analysis dialog box

Shortcut button	Click to display calibration item screens that are not currently displayed. If the data in a screen includes a warning, a warning mark appears.
Data display area	
Calibration parameters	The analysis parameters to be calibrated are displayed. Different parameters are displayed depending on the type of analyzer that is connected.
[No. 1] - [No. 11]	For each calibration parameter, the analysis results are displayed for the 11 repeated analysis cycles. A strike-through is displayed for the results for [No. 1] since it is not reflected in [Mean Value], [SD], and [CV (%)].
[Mean Value]	For each calibration parameter, the mean value of the analyzed values from [No.2] to [No.11] is displayed.
[SD]	For each calibration parameter, the standard deviation of the analyzed values from [No. 2] to [No. 11] is displayed. If the [Mean Value] is 0, "[----]" is displayed.
[CV(%)]	Displays the coefficient of variation for the analysis result for each calibration parameter. After the 11th analysis is complete, if the coefficient of variation is greater than the [Limit (%)], then it is displayed in white font on red background.
[Limit (%)]	Displays the standard value (acceptable value) for the coefficient of variation of each calibration parameter.
Back button	Click to display the previous screen.
Next button	Click to display the next screen.

7 Mix the vial containing the sample as shown.

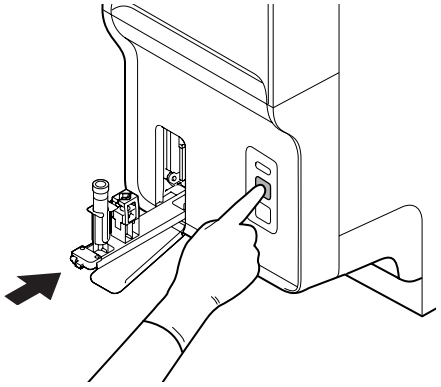


8 Place the vial in the sample tube holder.



9 Press the start switch on the analyzer.

Once the manual analysis starts, the analysis is performed 11 times consecutively, with the tube holder pulled into the analyzer.
Once the analysis finishes, the tube holder slides out.
Wait until all analyses are complete.



Information

If an error occurs during an analysis, and the analysis can no longer continue, stop precision check. Once the error is cleared, redo the manual analysis.

10 Redo the manual analysis.

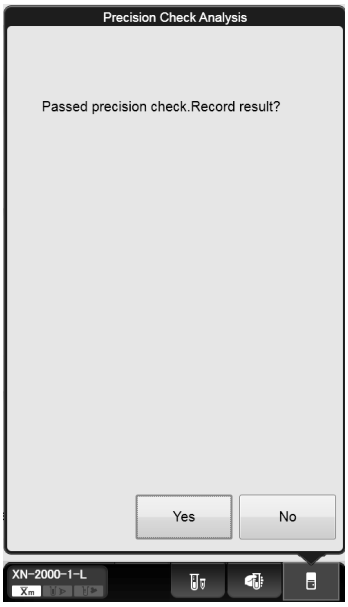
The results from the analysis in step 9 are displayed in the [Precision Check] analysis dialog box.
When the analysis results do not satisfy the conditions below, the test numbers of tests that must be repeated are displayed in the [Precision Check] analysis dialog box. Select and redo the manual analysis.

- All analysis results are normal.
- All calibration parameters are below the [Limit (%)] value.

When the analysis results satisfy the conditions, [OK] can be clicked in the [Precision Check] analysis dialog box. Proceed to the next step.

11 Click [OK] on the [Precision Check] analysis dialog box.

The dialog box on the right appears.



12 Click [Yes].

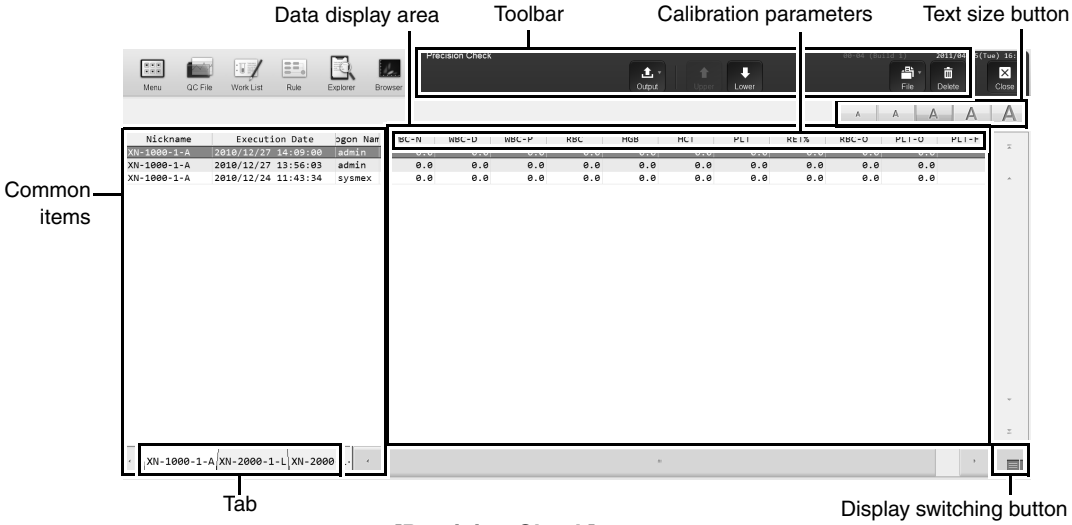
The results are added to the precision check history.
For details on precision check history, see below.
(➤**P.12-26** "12.5.1 Precision Check screen")

12.5 Manage the Precision Check History

Up to 20 records can be saved in the precision check history per analyzer, and any record after the 20th record overwrites the existing records, starting from the oldest. Each history can be output, saved, restored, and deleted.

12.5.1 Precision Check screen

Clicking the [Precision Check] icon in the Menu screen displays the following screen.



[Precision Check] screen

Toolbar

Displays buttons with the following functions.

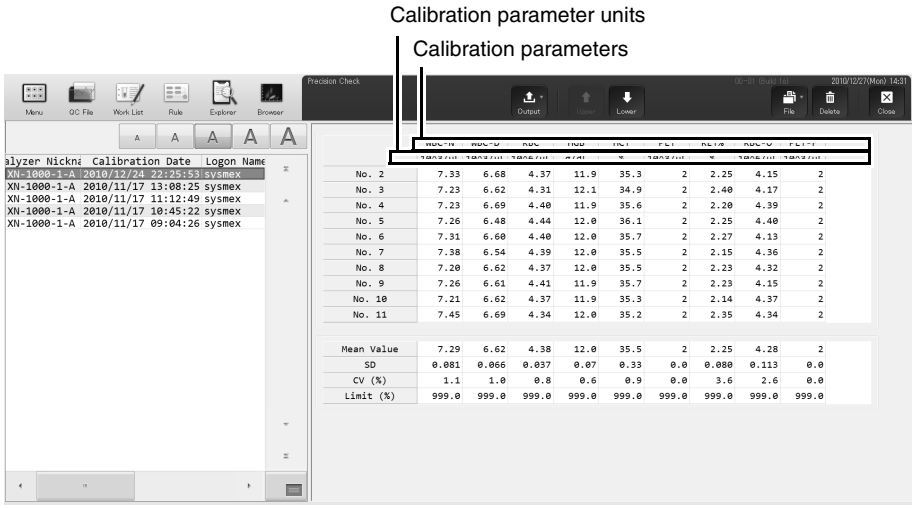
[Output]	When clicked, the selected precision check history data is output.
[Upper]	Click to move the selection up by one row.
[Lower]	Click to move the selection down by one row.
[File]	Click to display a submenu that allows you to save and restore data.
[Delete]	When clicked, a dialog box appears that allows you to delete the selected precision check history.

Common items

[Analyzer Nickname]	Displays the name of the analyzer for which precision check was performed.
[Execution Date]	Displays the date and time that the result of the precision check was recorded.
[Logon Name]	Displays the name of the user who was logged on to IPU, at the time of precision check.

Data display area

When you click the display switching button, the following screen is displayed.



Calibration parameters*	The analysis parameters to be calibrated are displayed.
Calibration parameter units*	Displays the units of the calibration parameters.
[No. 2] - [No. 11]	For each calibration parameter, the analysis results are displayed for the 11 repeated analysis cycles.
[Mean Value]	Displays the average analyzed value for each calibration parameter.
[SD]	Displays the standard deviation of the analyzed values for each calibration parameter.
[CV (%)]	Displays the coefficient of variation for each calibration result.
[Limit (%)]	Displays the standard repeatability value for each calibration parameter.

* The display will vary depending on the type of analyzer that is connected.

Note:

The [Precision Check] screen has similar functions as the [Calibration] screen. For the operation of the following, see the procedures for the [Calibration].
(➤**P.12-16** "12.3.1 Calibration screen")

- Tabs
- Display switching button
- Text size button
- Selecting multiple precision check history data

12.5.2 Outputting precision check history

You can save the selected precision check history as a CSV file, or print to a connected printer as a list (ledger printing).
Follow the steps below to output the precision check history.

1 Click the [Precision Check] icon in the Menu screen.

The [Precision Check] screen appears.

2 Select the precision check history to output.

3 Select the format and output.

● **Outputting in CSV format**

On the toolbar, click the [File] button - [Output in CSV Format], then name and save the file.
The file extension is ".csv".

● **Printing to a Ledger**

On the toolbar, click the [Output] button, and then [Ledger (LP)].

12.5.3 Saving a precision check history (backup)

You can save a precision check history as a file.
Follow the steps below to save a precision check history.

1 Click the [Precision Check] icon in the Menu screen.

The [Precision Check] screen appears.

2 Select the history you want to save.

3 On the toolbar, click on the [File] button, then click [Backup].

A folder selection dialog box appears, for specifying the folder to which you want to save the file.

4 Select the folder to which you want to save the file.

The file extension is ".pre".
You cannot change the file name.

12.5.4 Restoring a saved precision check history (Restore)

You can restore saved history.
Follow the steps below to restore a saved precision check history.

1 Click the [Precision Check] icon in the Menu screen.

The [Precision Check] screen appears.

2 On the toolbar, click on the [File] button, then click [Restore].

A dialog box for selecting the file to restore is displayed.

3 Select to open the file you want to restore.

The file extension is ".pre".

Information

In the following cases, the saved history cannot be restored.
- If the history is for a parameter that cannot be analyzed with the analyzer that is connected.
- If a history exists with the same date and time as the history being restored.

12.5.5 Deleting a precision check history

You can delete a precision check history.
Follow the steps below to delete a precision check history.

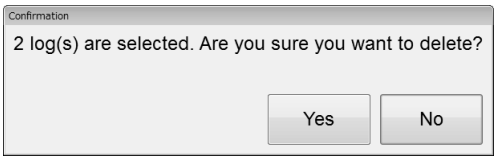
1 Click the [Precision Check] icon in the Menu screen.

The [Precision Check] screen appears.

2 Select the precision check history to delete.

3 Click the [Delete] button on the toolbar.

The dialog box on the right appears.



4 Click [Yes].

The selected history is deleted.

Chapter 13 Performing maintenance of instrument and replacing supply parts

This chapter explains an overview of the maintenance tasks for the instrument and explains how to perform those tasks, including the replacement of reagents and supply parts.

13.1 Introduction

Regular maintenance of the analyzers is necessary to keep the instrument in the most optimal condition. Please perform the appropriate maintenance tasks according to this chapter. In addition, whenever you perform a maintenance task, log it in the maintenance inspection checklist. (➤**P.13-82** "13.8 Maintenance inspection checklist")

To perform maintenance, the analyzer and the conveyor must be in READY state. Otherwise, maintenance cannot be performed. In addition, analysis is not possible during maintenance.

13.1.1 List of maintenance items

Maintenance tasks can be categorized into daily tasks, and tasks that are performed on an as need-basis. Below is a list of maintenance tasks.

Daily maintenance tasks

- Shutdown (➤**P.13-5** "13.2.1 Shutting down the instrument")

Maintenance tasks performed as needed

- Replacing waste container (➤**P.13-5** "13.3.1 Replace the waste container")
- Automatic rinsing (➤**P.13-7** "13.3.2 Perform auto rinse")
- Cleaning (➤**P.13-9** "13.3.3 Perform cleaning")
- Cleaning the instrument (➤**P.13-11** "13.3.4 Rinsing all instruments")
- Remove an RBC detector clog (➤**P.13-12** "13.3.5 Clog removal from the RBC detector")
- Cleaning RBC detector aperture (➤**P.13-13** "13.3.6 Rinse the RBC detector aperture")
- Draining the waste chamber (➤**P.13-17** "13.3.7 Drain the waste chamber")
- Rinsing the waste chamber (➤**P.13-17** "13.3.8 Rinse the waste chamber")
- Removing flowcell air bubbles (➤**P.13-19** "13.3.9 Remove air bubbles from flowcell")
- Rinsing flowcell (➤**P.13-20** "13.3.10 Rinse flowcell")
- Draining reaction chamber (➤**P.13-22** "13.3.11 Drain the reagent from the reaction chamber")
- Draining RBC isolation chamber (➤**P.13-22** "13.3.12 Drain the reagent from the RBC isolation chamber")
- Adjusting the pressure (0.25 MPa) (➤**P.13-23** "13.3.13 Adjust the pressure (0.25 MPa)")
- Adjusting the pressure (0.16 MPa) (➤**P.13-25** "13.3.14 Adjust the pressure (0.16 MPa)")
- Adjusting the pressure (0.07 MPa) (➤**P.13-27** "13.3.15 Adjust the pressure (0.07 MPa)")
- Draining the pneumatic trap chamber (➤**P.13-30** "13.3.16 Drain the pneumatic trap chamber")

Replacing reagents and supply parts

- Replacing reagents (➤**P.13-32** "13.4.1 List of reagents", **P.13-32** "13.4.2 About [Reagent Replacement] dialog box")
- Replacing a new dilution/hemolytic agent (➤**P.13-34** "13.4.3 Replace a new dilution/hemolytic agent", **P.13-37** "13.4.4 Replace with new CELLPACK DST")
- Replacing a new dye (➤**P.13-40** "13.4.5 Replace a new dye")
- Replenishing reagents (➤**P.13-43** "13.4.6 Replenish reagents")
- Draining the reagent (➤**P.13-45** "13.4.7 Drain the reagent")
- Reagent replacement history (➤**P.13-47** "13.4.8 Check the reagent replacement history")
- Replacing supply parts (➤**P.13-47** "13.5.1 Replace supply parts")
- Replacing piercer (➤**P.13-48** "13.5.2 Replace the piercer")
- Replacing fuse (➤**P.13-60** "13.5.3 Replace the fuse")

Time required (per analyzer)

The time guidelines for the procedure of maintenance are as shown below.

Maintenance Task	Time
Shutdown	About 15 minutes
Cleaning	About 20 minutes
Rinsing the waste chamber	About 15 minutes
Rinsing flowcell	About 10 minutes

13.1.2 Maintenance menu

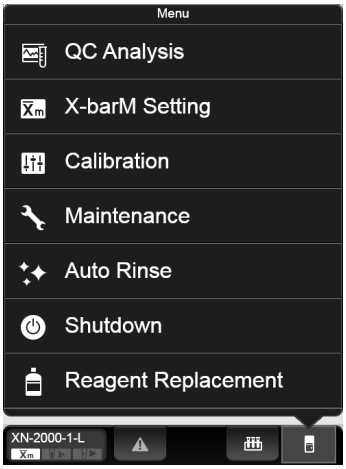
Analyzer Maintenance menu

You can perform specific maintenance tasks, operation checks, and operation test, using the Maintenance menu.

Follow the steps below to display the Maintenance menu.

1 Click the Analyzer menu button on the control menu.

The menu on the right appears.



2 Click [Maintenance].

The submenu on the right appears.

Note:

- For the details on operation checks, see Chapter 14. (➤**P.14-73** "Chapter 14: 14.5 Check the status of the device")
- For the details on operation test, see Chapter 14. (➤**P.14-79** "Chapter 14: 14.6 Test proper operation of the device")

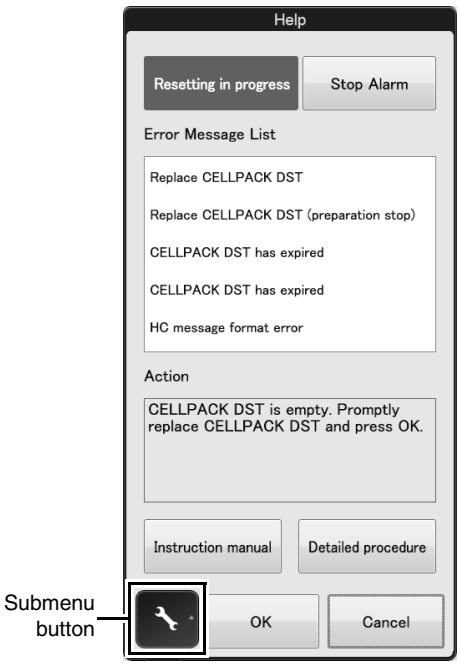
RU-20 Maintenance menu

When the RU-20 is used, special maintenance and settings can be performed in the RU-20 Maintenance menu.

Follow the steps below to display the RU-20 Maintenance menu.

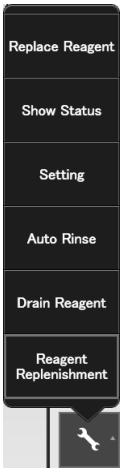
1 Click the RU menu button on the control menu.

The dialog box on the right appears.



2 Click the submenu button.

The submenu on the right appears.



Note:

For information on the settings, see the "Administrator's Guide".
(➤Administrator's Guide, "Chapter 4: 4.6 Reagent unit settings (RU-20)")

13.2 Daily maintenance tasks

13.2.1 Shutting down the instrument

Turn OFF the power after rinsing each instrument. When you finish analysis work for the day, always perform shutdown and then turn off the power. If analysis work will continue for more than one day, perform a shutdown once a day.
For details, see Chapter 6.
(➤**P.6-23** "Chapter 6: 6.7 Shutdown")

13.3 Maintenance tasks performed as needed

If an error occurs that requires maintenance, the help dialog box appears in the IPU screen. Perform the necessary maintenance tasks according to the message shown in the [Action] field in the help dialog box.
For the details on the help dialog box, see Chapter 14.
(➤**P.14-2** "Chapter 14: 14.1.2 Help dialog box")

13.3.1 Replace the waste container

If you are using waste tank full sensor and waste container becomes full, the help dialog box appears in the IPU screen.

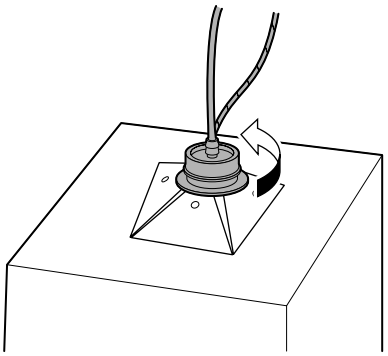
Risk of infection
Use caution to prevent waste from splattering.

Caution!
Install the waste tank below the bottom of the analyzer.

Follow the steps below to replace the waste container.

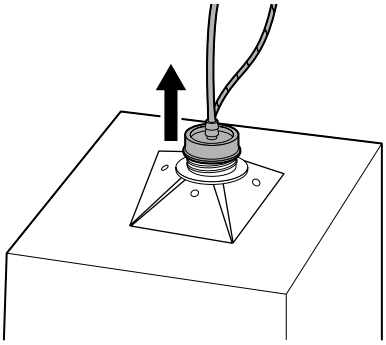
1 Prepare an empty waste container and remove the cap.

2 Loosen the cap on the full waste container by turning it in the direction of the arrow.



3 Lift the cap straight up with the tube connected.

For disposing a full waste container, see Chapter 2.
(➤**P.2-4** "Chapter 2: 2.8 Disposal of materials")



4 Insert the cap straight into the new waste container, with the tube connected.

5 Close the cap by turning it in the direction that is opposite of the direction in step 2.

6 Click [Accept] in the help dialog box.

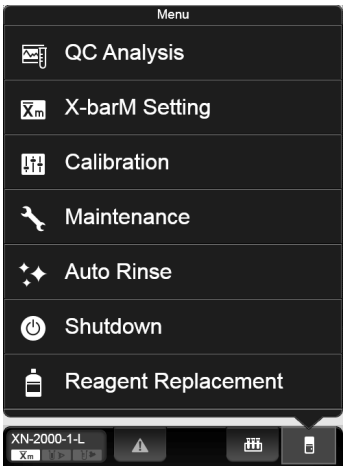
13.3.2 Perform auto rinse

Automatic analyzer rinse

You can automatically perform rinsing of the analyzer and the post-rinse background check.
If a background check error occurs, a help dialog will appear on the IPU screen.
Follow the procedure below to perform automatic rinsing.

1 Click the Analyzer menu button on the control menu.

The menu on the right appears.



2 Click [Auto Rinse].

The menu automatically closes, [Auto Rinse] appears in the control menu and auto rinse starts. Progress is shown as a progress bar in the control menu. Wait until it is complete.
Once complete, [Auto Rinse] disappears and the background check begins.
For the details on background check, see Chapter 6.
(Background check ➤**P.6-20** "Chapter 6: 6.4.5 Execution of analyzer self-check")

In [Body Fluid] mode, the background check for body fluid analysis starts*.
For the details on background check of body fluid mode, see Chapter 9.
(➤**P.9-11** "Chapter 9: 9.4 Body fluid analysis")

* The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.

Automatic RU-20 rinse

When using the RU-20, follow the steps below to perform automatic rinsing. In the event that a reagent preparation problem occurs, the partially prepared reagent can be drained and the interior of the RU-20 automatically rinsed.
When automatic rinsing is performed, the prepared reagent in the supply tank is not drained.
Follow the procedure below to perform automatic rinsing.

1 Display the RU-20 Maintenance menu.

(➤**P.13-4** "RU-20 Maintenance menu")

2 Click [Auto Rinse].

The dialog box on the right appears.

3 Click [Execute].

The dialog box automatically closes, [Maintenance in progress] appears in the operation status display area of the help dialog box, and automatic rinsing begins. For the operation status display area, see Chapter 14. (➤**P.14-2** "Chapter 14: 14.1.2 Help dialog box") Wait until it is complete. When it is complete, [Maintenance in progress] disappears.

4 Click [Cancel].

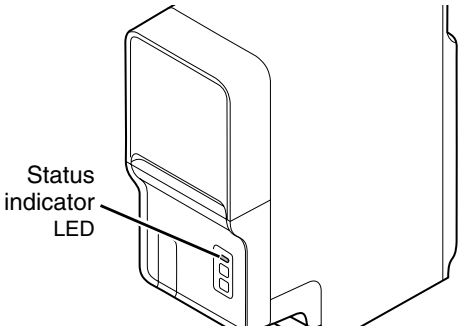
The dialog box closes.

13.3.3 Perform cleaning

If the error is not cleared after automatic rinsing is performed, perform cleaning. In addition, when the required time for cleaning arrives, a help dialog will appear on the IPU screen.
You can clean the optical detector block and hydraulic circuit with CELLCLEAN AUTO.
Follow the steps below to perform cleaning.

1 Check the Status indicator LED on the analyzer.

If the Status indicator LED is not lit green, wait until it does.

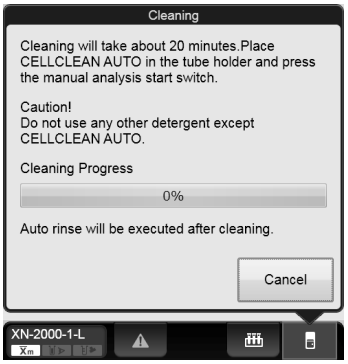


2 Display the Maintenance menu.

(➤**P.13-2** "13.1.2 Maintenance menu")

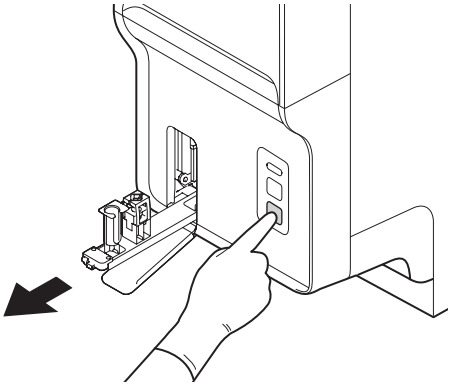
3 Click [Cleaning].

The window on the right appears.



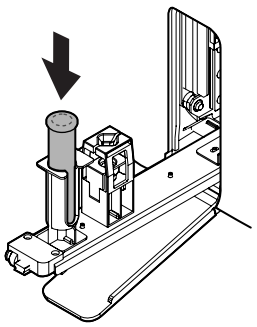
4 If the tube holder is not ejected, press the mode switch on the analyzer.

The tube holder slides out forward.



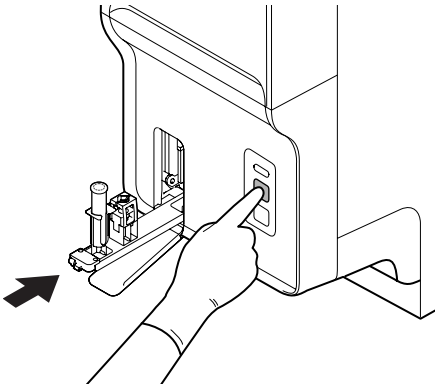
5 Place the CELLCLEAN AUTO in the sample tube holder.

Set it into the front holder, when you face the analyzer.



6 Press the start switch on the analyzer.

The sample tube holder retracts into the analyzer and aspiration begins. Wait until this process is finished.
When the process ends, cleaning starts and the tube holder is ejected.
Cleaning takes about 20 minutes. Progress is shown as a progress bar on the screen. Wait until this process is finished.



7 Remove the CELLCLEAN AUTO.

8 Press the mode switch.

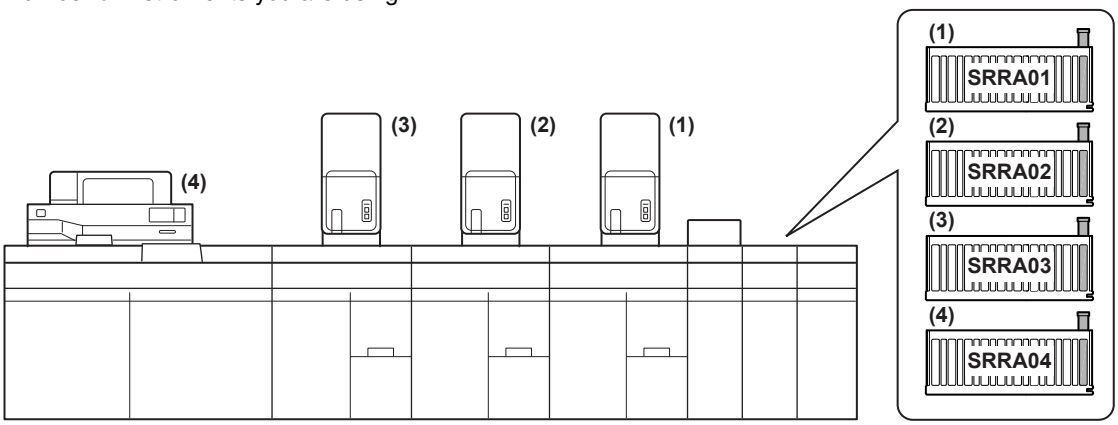
The tube holder slides into the analyzer.
Once cleaning is complete, auto rinse starts automatically. (➤**P.13-7** "13.3.2 Perform auto rinse")
Wait until it is complete. When it is complete, the window closes automatically.

13.3.4 Rinsing all instruments

All analyzers or an individual analyzer connected to the conveyor can be rinsed using CELLCLEAN AUTO. Use the special racks for rinsing. Racks for rinsing have a blue label for identification. In the procedure below, racks with a barcode label beginning with "SRRA" are used as an example. For details, see the "Administrator's Guide".
(➤Administrator's Guide, "Chapter 5: 5.3.1 Acceptable barcodes")
Follow the steps below to perform rinsing.

1 Place CELLCLEAN AUTO in the rack.

Place CELLCLEAN AUTO in the racks with numbers corresponding to each analyzer as shown below (recommended).
This procedure uses the basic configuration (four analyzers) as an example. Prepare a number of racks equal to the number of instruments you are using.



Note:

- You can rinse a particular instrument by placing only the rack for that instrument.
- Rinsing can also be performed placing CELLCLEAN AUTO only in the rack with the barcode label "SRRA00". In this case, the placement positions in the rack correspond to the instruments as follows:
  - 7th: 4th connected analyzer
  - 8th: 3rd connected analyzer
  - 9th: 2nd connected analyzer
  - 10th: 1st connected analyzer

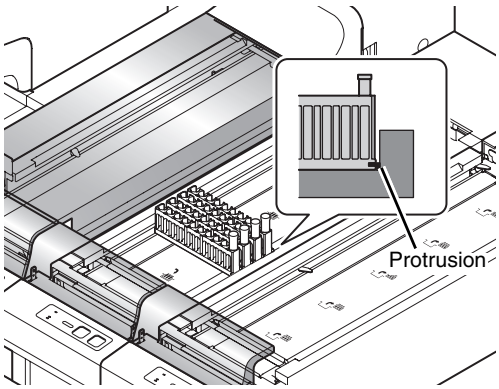
  For details, see the "Administrator's Guide".
  (➤Administrator's Guide, "Chapter 5: 5.3.1 Acceptable barcodes")

2 Place the rack in the feeder.

Slide the groove on the rack onto the protrusion on the right side (when you face the analyzer).

Conveying automatically starts when the rack is placed.

- CELLCLEAN AUTO is aspirated in each instrument and rinsing begins sequentially.
- The SP-10 shuts down and then automatically restarts.



Note:

- Use one vial of CELLCLEAN AUTO for each instrument. Do not reuse CELLCLEAN AUTO that has already been used.
- Do not mix regular sample tubes together with CELLCLEAN AUTO.

13.3.5 Clog removal from the RBC detector

If the RBC detector is clogged or air bubbles have formed, a help dialog will appear on the IPU screen. Follow the procedure below to remove the clog from the RBC detector.

1 Display the Maintenance menu.

(➤**P.13-2** "13.1.2 Maintenance menu")

2 Click [Remove RBC Detector Clog].

The window appears, and the removal of the clog starts. Progress is shown as a progress bar on the screen. Wait until it is complete. When it is complete, the window closes automatically.

Note:

If the clog cannot be removed with this operation, see below.
(➤**P.13-13** "13.3.6 Rinse the RBC detector aperture")

13.3.6 Rinse the RBC detector aperture

If the removing the clog from the RBC detector does not remove all the clog or clear the error, rinse the RBC detector aperture.

⚠ Warning!

Never touch the detector when the power of the Main Unit is turned ON.
An electrical shock could occur.

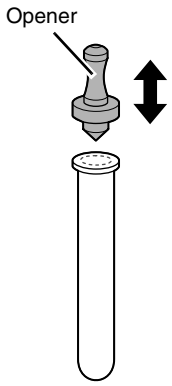
⚠ Caution!

- Be sure to use CELLCLEAN AUTO only.
- When closing the detector cover, take care not to kink the tube.
  Otherwise, it may lead to incorrect analysis.
- When rinsing the detector aperture, use the supplied unclogging brush and lightly tap on the detector aperture.
  Excessive force will damage the detector aperture.

Follow the steps below to rinse the RBC detector aperture.

1 Open CELLCLEAN AUTO with the special CELLCLEAN AUTO opener.

With CELLCLEAN AUTO held straight as shown, press down the opener until you hear a "pop" sound.
Keep the opener attached, and remove immediately before you use CELLCLEAN AUTO.



⚠ Caution!

- Always wear rubber gloves when opening CELLCLEAN AUTO.
- Press down slowly so that the content fluid does not splash.
- Store opened CELLCLEAN AUTO standing on the rack with the opener attached.
  If CELLCLEAN AUTO is tilted, the content fluid may leak even when the opener is attached.

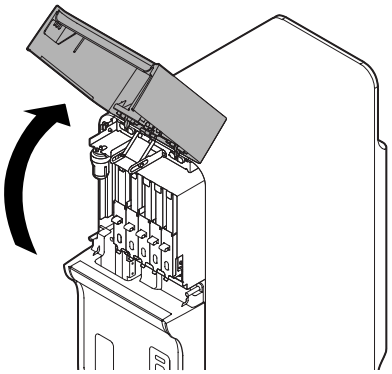
2 Shutting down analyzer for maintenance.

Shut down the instrument and switch off the main power switch.
For analyzer shutdown procedures, see Chapter 6.
(➤**P.6-25** "Chapter 6: 6.7.2 Shutting down the analyzer manually")

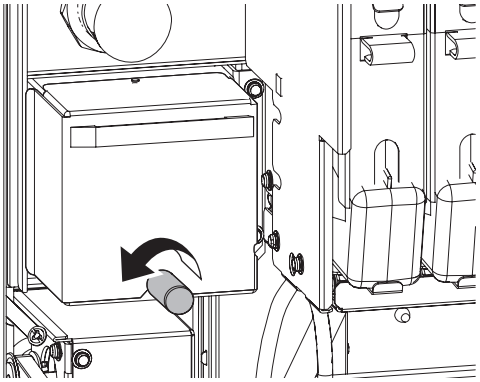
> **Note:**
> When [IPU Shutdown] is set to ON, the IPU shuts down automatically after all analyzers connected to the IPU have shut down.

3 Open the top front cover.

Open to the highest point. It may move down.

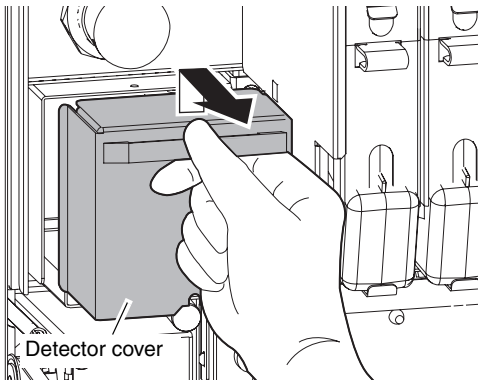


4 Loosen the screw that is holding the detector cover in place.

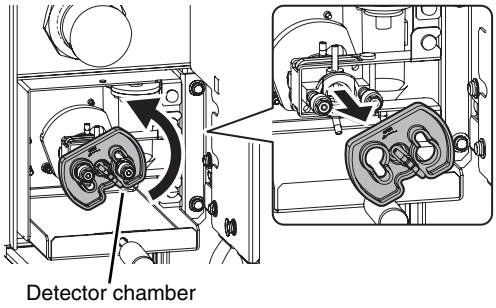


5 Remove the detector cover.

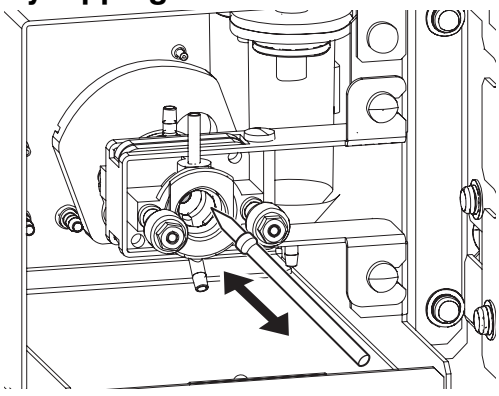
Lift it temporarily, and pull it out toward you.



6 Pull out the lid of the detector chamber by turning it in the direction of the arrow.



7 Soak the supplied unclogging brush in the content fluid of CELLCLEAN AUTO, and wash the detector aperture by lightly tapping it.

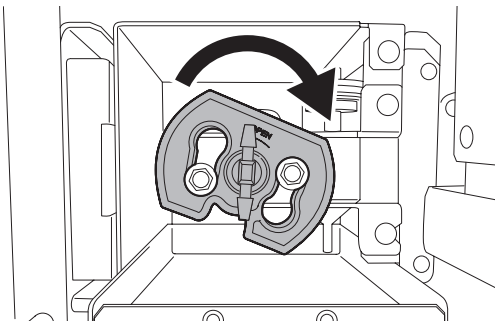


Note:

If fluid spills, wipe off the spilled fluid with a piece of tissue paper.

8 Insert the detector chamber cap straight in, and turn in the direction of the arrow.

Insert the detector chamber cap all the way in and attach in the position as shown in the diagram to the right.



Caution!

If the detector chamber cover is not properly attached, correct analysis results will not be obtained. There is also a risk of instrument damage due to fluid leakage.

9 Attach the detector cover and secure with the screw.

10 Close the top front cover.

11 Turn ON the analyzer's power.

For procedures to restart the analyzer, see Chapter 6. (➤**P.6-30** "Chapter 6: 6.8 Restart the analyzer")

Note:

- Wash the brush and opener well and store in a clean state.
  Risk of instrument malfunctioning if there are small particles or other contaminants on the brush or opener.
- CELLCLEAN AUTO used for rinsing can be used for shutdown that day. To do so, remove the opener from the CELLCLEAN AUTO, place in the sample tube holder, and shut down manually. For details, see Chapter 6. (➤**P.6-25** "Chapter 6: 6.7.2 Shutting down the analyzer manually")

13.3.7 Drain the waste chamber

If the waste tube from the waste chamber is clogged, a help dialog will appear on the IPU screen.
Follow the procedure below to drain waste fluid that has collected in the waste chamber.

1 Display the Maintenance menu.

(➤**P.13-2** "13.1.2 Maintenance menu")

2 Click [Drain Waste Fluid Chamber].

The menu closes automatically, [Drain Waste Fluid Chamber] appears in the control menu, and draining begins.
Wait until it is complete. When it is complete, [Drain Waste Fluid Chamber] disappears.

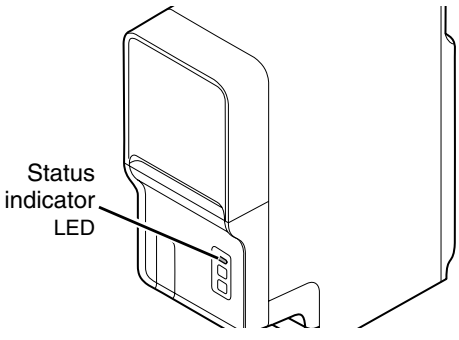
> **Note:**
> If the error cannot be cleared with this operation, see below.
> (➤**P.13-17** "13.3.8 Rinse the waste chamber")

13.3.8 Rinse the waste chamber

If the error is not cleared after waste fluid is drained from the waste chamber, rinse the waste chamber.
You can clean the waste chamber with CELLCLEAN AUTO.
Follow the steps below to rinse the inside of the waste chamber.

1 Check the Status indicator LED on the analyzer.

If the Status indicator LED is not lit green, wait until it does.

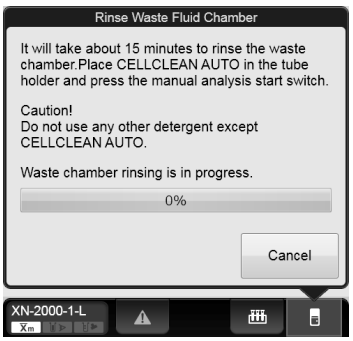


2 Display the Maintenance menu.

(➤**P.13-2** "13.1.2 Maintenance menu")

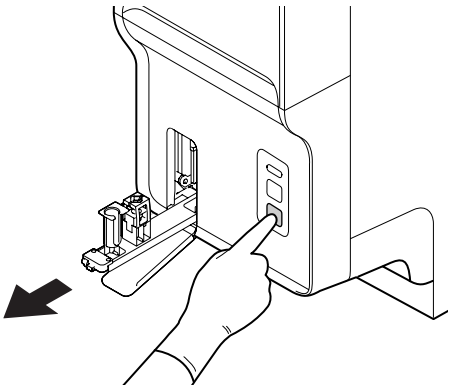
3 Click [Rinse Waste Fluid Chamber].

The window on the right appears.



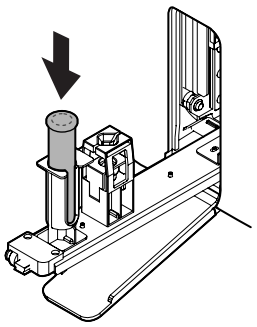
4 If the tube holder is not ejected, press the mode switch on the analyzer.

The tube holder slides out forward.



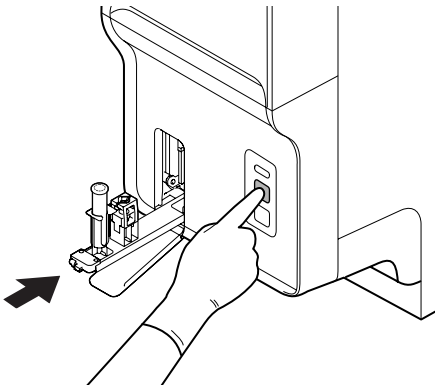
5 Place the CELLCLEAN AUTO in the sample tube holder.

Set it into the front holder, when you face the analyzer.



6 Press the start switch on the analyzer.

The tube holder retracts into the analyzer and rinsing starts. Rinsing takes about 15 minutes. Progress is shown as a progress bar on the screen. Wait until this process is finished. When the process ends, the tube holder is ejected.



7 Remove the CELLCLEAN AUTO.

8 Press the mode switch.

The tube holder slides into the analyzer.

13.3.9 Remove air bubbles from flowcell

If air bubbles have formed in the Flowcell, a help dialog will appear on the IPU screen. Follow the procedure below to remove the air bubbles from the inside of the Flowcell.

1 Display the Maintenance menu.

(➤**P.13-2** "13.1.2 Maintenance menu")

2 Click [Remove Flowcell Air Bubbles].

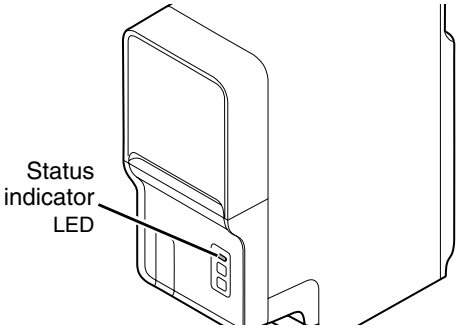
The window appears, and the removal of air bubbles starts. Wait until it is complete. Progress is shown as a progress bar on the screen. When it is complete, the window closes automatically.

13.3.10 Rinse flowcell

If the Flowcell is clogged or dirty, a help dialog will appear on the IPU screen.
Follow the procedure below to rinse the inside of the Flowcell.

1 Check the Status indicator LED on the analyzer.

If the Status indicator LED is not lit green, wait until it does.

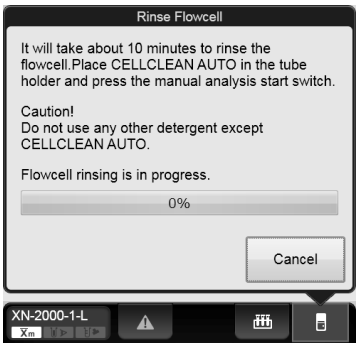


2 Display the Maintenance menu.

(➤**P.13-2** "13.1.2 Maintenance menu")

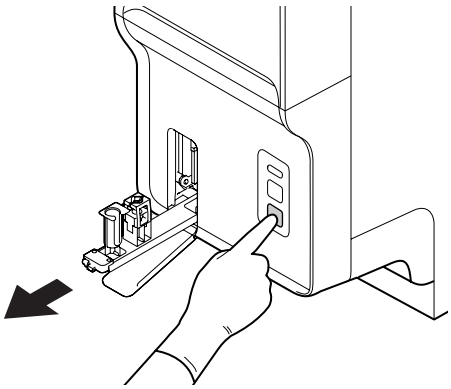
3 Click [Rinse Flowcell].

The window on the right appears.



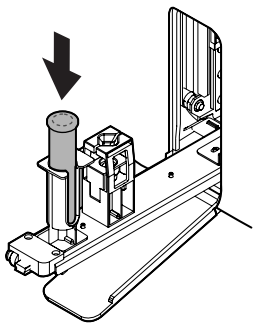
4 If the tube holder is not ejected, press the mode switch on the analyzer.

The tube holder slides out forward.



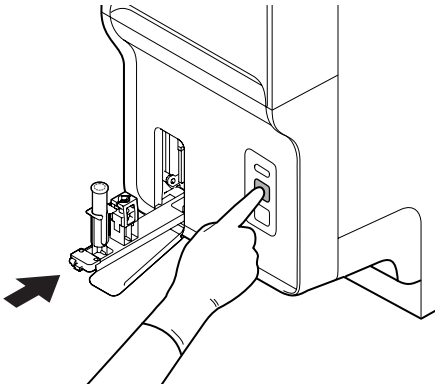
5 Place the CELLCLEAN AUTO in the sample tube holder.

Set it into the front holder, when you face the analyzer.



6 Press the start switch on the analyzer.

The tube holder retracts into the analyzer and rinsing starts. Rinsing takes about 10 minutes. Progress is shown as a progress bar on the screen. Wait until this process is finished. When the process ends, the tube holder is ejected.



7 Remove the CELLCLEAN AUTO.

8 Press the mode switch.

The tube holder slides into the analyzer.

13.3.11 Drain the reagent from the reaction chamber

If the drain tubing in the RBC/HGB reaction chamber is clogged, the help dialog box appears in the IPU screen. Follow the procedure below to drain reagent that has collected in the reaction chamber.

1 Display the Maintenance menu.

(➤**P.13-2** "13.1.2 Maintenance menu")

2 Click [Drain Reaction Chamber].

The window appears, and draining starts. Wait until it is complete. When it is complete, the window closes automatically.

13.3.12 Drain the reagent from the RBC isolation chamber

If the density of the reagent is inconsistent, [PLT sampling error] appears on a help dialog of the IPU screen. If the error appears after clear it, drain the reagent from the RBC isolation chamber.
Follow the steps below to drain the reagents that have accumulated in the RBC isolation chamber.

1 Display the Maintenance menu.

(➤**P.13-2** "13.1.2 Maintenance menu")

2 Click [Drain RBC Isolation Chamber].

The window appears, and draining starts. Wait until it is complete. Progress is shown as a progress bar on the screen. When it is complete, the window closes automatically.

13.3.13 Adjust the pressure (0.25 MPa)

A 0.25 MPa pressure is applied to operate the master valves.
If an error message for pressure abnormality is displayed, first check the tubes to see if there is any air leakage. If there is no abnormality in the tube, display the [Pressure Adjustment] window and adjust the pressure by checking the numeric values.

Information

If the pressure is too high, first decrease it below the specified value, and then increase to adjust it.

Follow the steps below to adjust the 0.25 MPa pressure. The adjustment is done in the pneumatic unit.

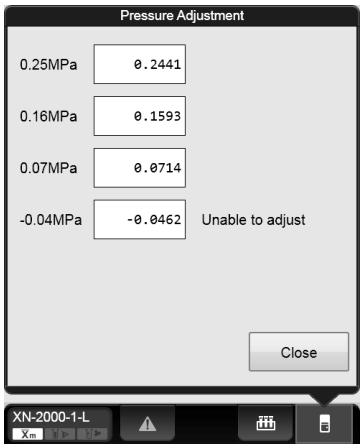
1 Display the Maintenance menu.

(➤**P.13-2** "13.1.2 Maintenance menu")

2 Click [Pressure Adjustment].

The window on the right appears.
Each monitored pressure and its current value are displayed.

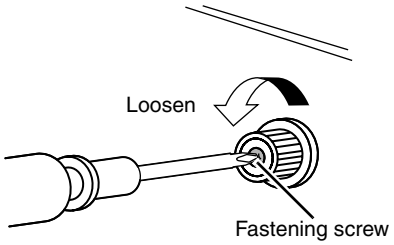
[0.25MPa]	Shows the value read for 0.25 MPa.
[0.16MPa]	Shows the value read for 0.16 MPa.
[0.07MPa]	Shows the value read for 0.07 MPa.
[-0.04MPa]	Shows the value read for -0.04 MPa. This cannot be adjusted.



[Pressure Adjustment] window

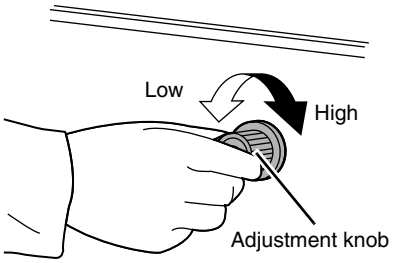
3 Loosen the fastening screw for the 0.25 MPa regulator on the front of the pneumatic unit.

For the location of the regulator, see Chapter 4.
(➤**P.4-4** "Chapter 4: 4.2 Pneumatic unit")



4 Adjust the pressure by turning the knob on the 0.25 MPa regulator.

While checking the pressure displayed in the [Pressure Adjustment] window, adjust the pressure to the specified value (0.25 ± 0.04 MPa). Turn the knob clockwise to increase the pressure, and counter-clockwise to decrease the pressure.



Note:

When using the RU-20, you can also check the pressure indication in the [Show Status] window while adjusting the pressure.
(➤**P.13-29** "Adjust the pressure of the RU-20")

5 Tighten the fastening screw of the 0.25 MPa regulator, without turning the adjustment knob.

6 Click [Close] in the [Pressure Adjustment] window.

The window closes.

13.3.14 Adjust the pressure (0.16 MPa)

A 0.16 MPa pressure is applied to the optical detection block to supply the sheath fluid.
If an error message for pressure abnormality is displayed, first check the tubes to see if there is any air leakage. If there is no abnormality in the tube, display the [Pressure Adjustment] window and adjust the pressure by checking the numeric values.

Information

If the pressure is too high, first decrease it below the specified value, and then increase to adjust it.

Follow the steps below to adjust the 0.16 MPa pressure. The adjustment is done in the main unit.

1 Display the Maintenance menu.

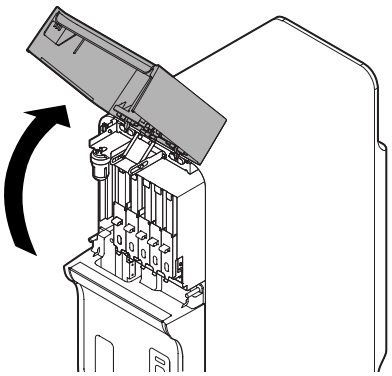
(➤**P.13-2** "13.1.2 Maintenance menu")

2 Click [Pressure Adjustment].

The [Pressure Adjustment] window appears.
([Pressure Adjustment] window ➤**P.13-23** "13.3.13 Adjust the pressure (0.25 MPa)")

3 Open the top front cover.

Open to the highest point. It may move down.

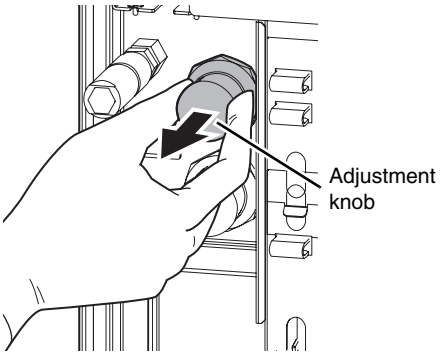


Caution!

During analysis and other times when the analyzer is in operation, never open the top front cover.

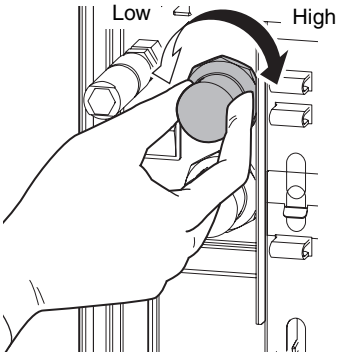
4 Pull out the adjustment knob on the 0.16 MPa regulator to unlock it.

For the location of the regulator, see Chapter 4.
(➤**P.4-1** "Chapter 4: 4.1 Analyzer")



5 Adjust the pressure by turning the knob on the 0.16 MPa regulator.

While checking the pressure displayed in the [Pressure Adjustment] window, adjust the pressure to the specified value (0.16 ± 0.016 MPa). Turn the knob clockwise to increase the pressure, and counter-clockwise to decrease the pressure.



6 Push the adjustment knob on the 0.16 MPa regulator to lock it.

7 Close the top front cover.

8 Click [Close] in the [Pressure Adjustment] window.

The window closes.

13.3.15 Adjust the pressure (0.07 MPa)

A 0.07 MPa pressure is applied to drain waste and mix the samples.
If an error message for pressure abnormality is displayed, first check the tubes to see if there is any air leakage. If there is no abnormality in the tube, display the [Pressure Adjustment] window and adjust the pressure by checking the numeric values.

Information

If the pressure is too high, first decrease it below the specified value, and then increase to adjust it.

Adjust the pressure of the analyzer

Follow the steps below to adjust the 0.07 MPa pressure. The adjustment is done in the main unit.

1 Display the Maintenance menu.

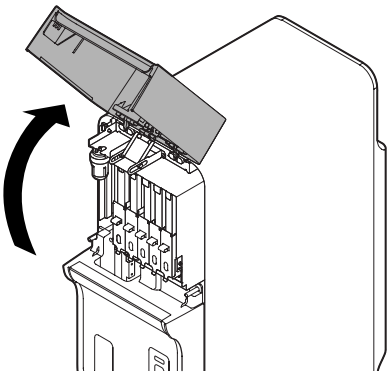
(➤**P.13-2** "13.1.2 Maintenance menu")

2 Click [Pressure Adjustment].

The [Pressure Adjustment] window appears.
([Pressure Adjustment] window ➤**P.13-23** "13.3.13 Adjust the pressure (0.25 MPa)")

3 Open the top front cover.

Open to the highest point. It may move down.

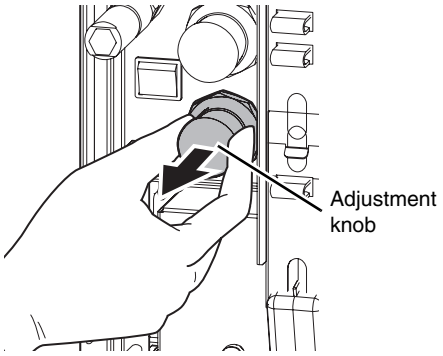


Caution!

During analysis and other times when the analyzer is in operation, never open the top front cover.

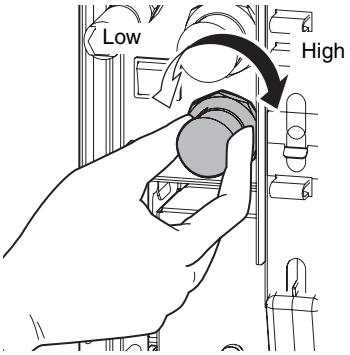
4 Pull out the adjustment knob on the 0.07 MPa regulator to unlock it.

For the location of the regulator, see Chapter 4.
(➤**P.4-1** "Chapter 4: 4.1 Analyzer")



5 Adjust the pressure by turning the knob on the 0.07 MPa regulator.

While checking the pressure displayed in the [Pressure Adjustment] window, adjust the pressure to the specified value (0.07 ± 0.01 MPa). Turn the knob clockwise to increase the pressure, and counter-clockwise to decrease the pressure.



6 Push the adjustment knob on the 0.07 MPa regulator to lock it.

7 Close the top front cover.

8 Click [Close] in the [Pressure Adjustment] window.

The window closes.

Adjust the pressure of the RU-20

Follow the steps below to adjust the 0.07 MPa pressure. The adjustment is done on the RU-20.

1 Display the RU-20 Maintenance menu.

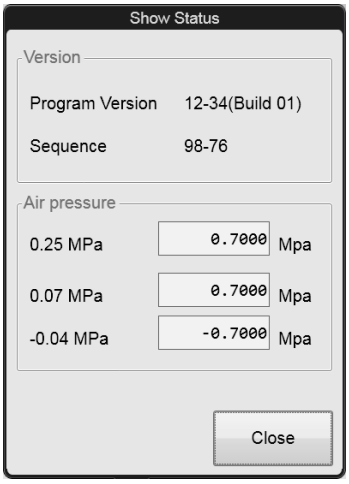
(➤**P.13-4** "RU-20 Maintenance menu")

2 Click [Show Status].

The window on the right appears.

Each monitored pressure and its current value are displayed.

[0.25MPa]	Displays the source pressure of the pneumatic unit.
[0.07MPa]	Displays the pressure value inside the instrument.
[-0.04MPa]	Displays the vacuum value inside the instrument.



[Show Status] window

3 Adjust the pressure.

For the detailed procedure, see the RU-20 "Instructions For Use".

(➤RU-20 Instructions for Use, "Chapter 6: 6.2.2 Adjusting the air pressure" Step 2 and following steps)

4 Click [Close] in the [Show Status] window.

The window closes.

13.3.16 Drain the pneumatic trap chamber

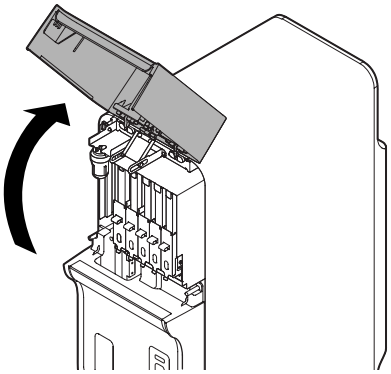
If the pneumatic trap chamber becomes full of water, a help dialog will appear on the IPU screen.
Check if the trap chamber is full of water, and drain as needed.

Caution!
If water accumulates daily, the analyzer may have malfunctioned.
Contact your Sysmex technical representative.

Follow the steps below to drain the pneumatic trap chamber.

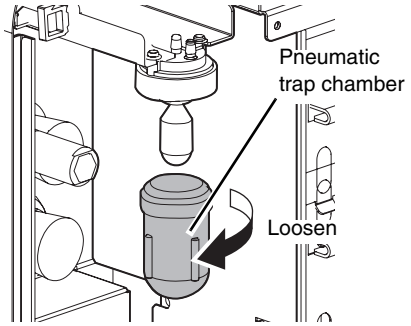
1 Open the top front cover.

Open to the highest point. It may move down.



Caution!
During analysis and other times when the analyzer is in operation, never open the top front cover.

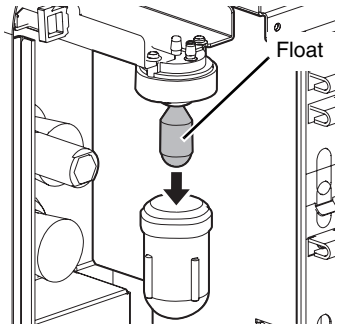
2 Remove the pneumatic trap chamber by rotating it in the direction of the arrow.



3 Discard water that has collected in the chamber.

4 Remove the float, and place it in the pneumatic trap chamber.

Hold the removed float in the same orientation and put it straight into the pneumatic trap chamber.



5 Attach the pneumatic trap chamber by turning it in the direction that is opposite from step 2.

6 Close the top front cover.

13.3.17 View the maintenance log

The maintenance log can be viewed. The log data shows maintenance execution information, and comments can be entered. The log can be printed or output as a file in CSV format.
For details, see below.
(➤**P.13-68** "13.6 About the history screen", **P.13-76** "13.7 About the RU history screen")

13.4 Replace reagents

This section explains how to replace reagents.

13.4.1 List of reagents

The following reagents are used in this device. For details on each reagent, see Chapter 5.
(➤**P.5-1** "Chapter 5: Reagents")

Product Code	Description	Volume
DCL-300A	CELLPACK DCL	20 L
DCL-310A	CELLPACK DCL	10 L
DST-300A	CELLPACK DST	20 L
DST-310A	CELLPACK DST	10 L
DST-320A	CELLPACK DST	4 L
DFL-300A	CELLPACK DFL	1.5 L
SLS-240A	SULFOLYSER*	1.5 L
SLS-250A	SULFOLYSER*	4 L
SLS-220A	SULFOLYSER*	5 L

Product Code	Description	Volume
WNR-200A	Lysercell WNR	4 L
WDF-200A	Lysercell WDF	4 L
WPC-200A	Lysercell WPC	1.5 L
WNR-800A	Fluorocell WNR	82 mL
WDF-800A	Fluorocell WDF	42 mL
WPC-800A	Fluorocell WPC	12 mL
RET-800A	Fluorocell RET	12 mL
PLT-800A	Fluorocell PLT	12 mL

* Available reagent package sizes may vary in some regions. For more details please contact your local Sysmex representative.

13.4.2 About [Reagent Replacement] dialog box

The [Reagent Replacement] dialog box allows you to check the remaining volume for reagents and replace them.
If a reagent runs out during an analysis, the analysis is paused, and an error message appears in the analyzer area of the Control menu. Display the [Reagent Replacement] dialog box to replace the reagent.
When using the RU-20, a help dialog box appears when CELLPACK DST runs low.
See below for the procedure for replacing CELLPACK DST.
(➤**P.13-37** "13.4.4 Replace with new CELLPACK DST")

Note:

Even when an error message does not appear, the steps below can be used to open the [Reagent Replacement] dialog box.

- Click the analyzer menu button in the control menu, and click [Reagent Replacement].
- Click the reagent level display in the control menu.

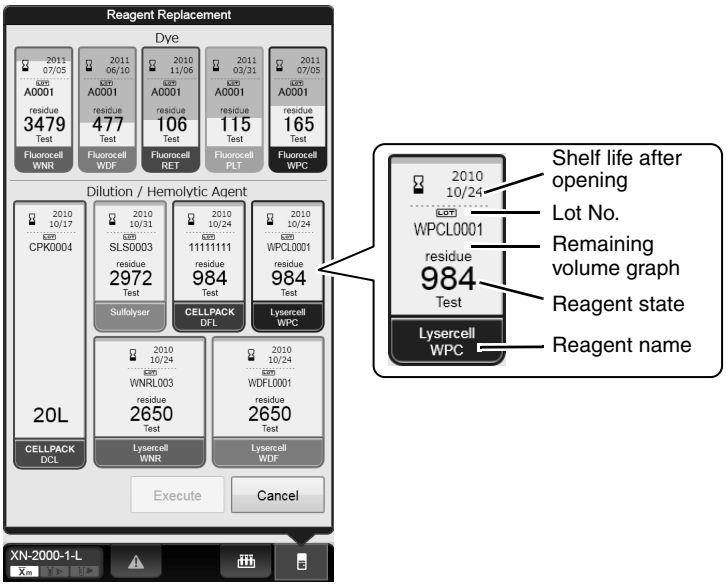
Follow the steps below to display the [Reagent Replacement] dialog box.

1 Click the help button on the control menu.

Help dialog box appears.
(➤**P.14-2** "Chapter 14: 14.1.2 Help dialog box")

2 Click [Execute].

The following dialog box appears, and the reagent remaining volume indicator appears.



Shelf life after opening	Display the shelf life of the reagent after opening. This is not displayed if the reagent has not been registered. When the shelf life after opening has expired, it displayed in white letter on a red background.
Lot No.	Displays the lot number of the reagent.
Reagent state	Displays the remaining number of tests for the reagent. (Only the remaining level of [CELLPACK DCL] reagent will be displayed.) The remaining number of tests is only an approximation. It can change with use conditions. This is not displayed if the reagent has not been registered. When the reagent runs low, the background becomes yellow. During diluent or hemolytic agent replacement, progress is indicated as "0 to 100%".
Reagent name	Displays the reagent name.
Remaining volume graph	Displays the remaining volume of the reagent as a graph. This is not displayed if the reagent has not been registered, or if the reagent has run out.

13.4.3 Replace a new dilution/hemolytic agent

This section explains how to replace the following reagents.

- CELLPACK DCL, CELLPACK DFL
- SULFOLYSER
- Lysercell WNR, Lysercell WDF, Lysercell WPC

See below for the procedure for replacing CELLPACK DST.
(➤**P.13-37** "13.4.4 Replace with new CELLPACK DST")
For cautions while replacing reagents, see Chapter 5. (➤**P.5-1** "Chapter 5: Reagents")

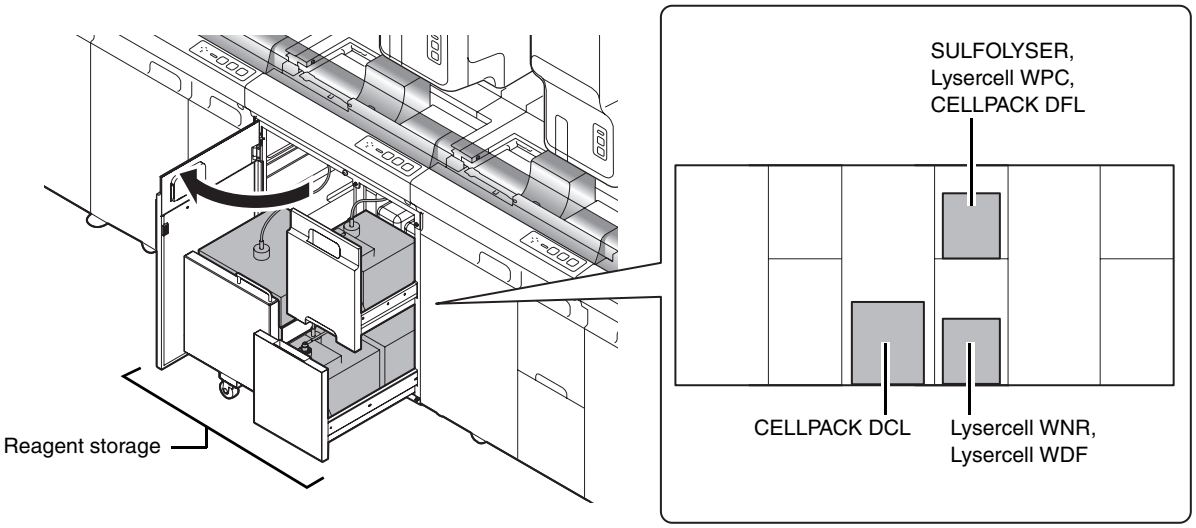
Caution!

- Install the reagent at a height no more than 1 meter above or below the bottom of the analyzer. Do not put reagents on top of the instrument.
- The new reagent must to be left for at 24 hours at room temperature (15 to 30°C).
- If reagent spills, immediately wipe it off using wet cloth or the like.

Note:

If you are sharing 1 reagent with multiple analyzers, replacing the reagent in 1 analyzer automatically replaces it in the other analyzers.

The reagent for the analyzer is stored in the area below. When replacing the reagent pull out the reagent storage slowly.



* The above diagram is an example. The installation locations of the reagents may vary depending on your conditions of use.

Warning!

- Open and close the storage using the handle on the dedicated wagon.
- When opening or closing the storage, watch your finger.
- Because the dedicated wagon is carrying the reagent, it is very heavy. When pulling out and pushing in the storage, do so slowly with care.

Follow the steps below to replace the reagent.

1 Display the [Reagent Replacement] dialog box.

(➤**P.13-32** "13.4.2 About [Reagent Replacement] dialog box")

2 Remove the cap from the new reagent container.

Check that the reagent has not expired.

3 Input the reagent code (barcode).

Input by barcode scanning

Scan the reagent code (barcode) on the outer box of the new reagent with hand-held barcode reader.
Reagent Code (barcode) is as shown the right illustration.

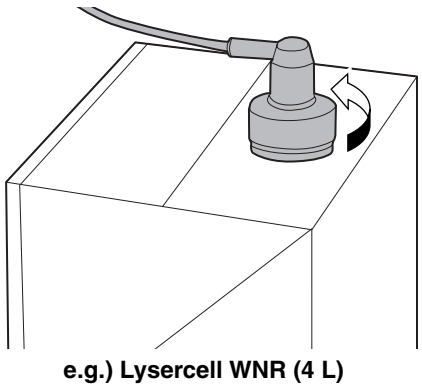
Manual input

Click the name of the reagent to be replaced in the [Reagent Replacement] dialog box.
Enter the reagent code (barcode) and click [OK].

Note:

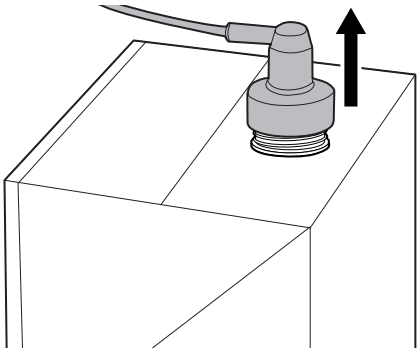
In case the reagent outer box label shows a "XN Reagent Code" barcode, please scan this barcode.

4 Remove the cap from the old reagent container.



e.g.) Lysercell WNR (4 L)

5 Pull out the dispensing set straight up.



6 Insert the dispensing set straight into the new reagent container.

7 Close the cap.

8 Click [Execute].

The replacement of the reagent starts. Wait until it is complete. When it is complete, the dialog box closes automatically. The time guidelines for replacement of the reagent are as shown below.

Reagent name	Time	Time*
CELLPACK DCL	About 1 and a half minutes	Maximum 7 and a half minutes
SULFOLYSER	About 2 minutes	About 1 minute
CELLPACK DFL	About 3 minutes	
Lysercell WPC		
Lysercell WDF		About 1 and a half minutes
Lysercell WNR		

* When using the reservoir tank.

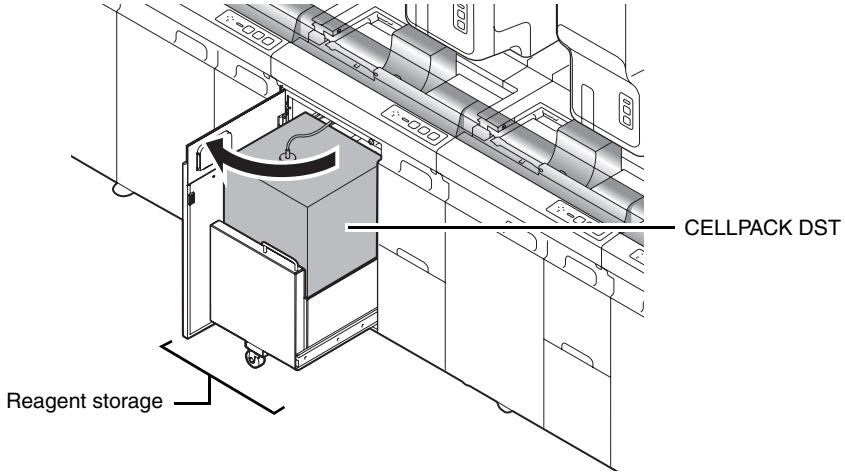
13.4.4 Replace with new CELLPACK DST

This section explains the procedure for replacing the CELLPACK DST when using the RU-20.
For cautions while replacing reagents, see Chapter 5. (➤**P.5-1** "Chapter 5: Reagents")

⚠ Caution!

- Install the reagent at a height no more than 1 meter above or below the bottom of the analyzer. Do not put reagents on top of the instrument.
- The new reagent must to be left for at 24 hours at room temperature (15 to 30°C).
- If reagent spills, immediately wipe it off using wet cloth or the like.

The CELLPACK DST is stored in the area below. When replacing the CELLPACK DST pull out the reagent storage slowly.



* The above diagram is an example. The installation locations of the reagents may vary depending on your conditions of use.

⚠ Warning!

- Open and close the storage using the handle on the dedicated wagon.
- When opening or closing the storage, watch your finger.
- Because the dedicated wagon is carrying the reagent, it is very heavy. When pulling out and pushing in the storage, do so slowly with care.

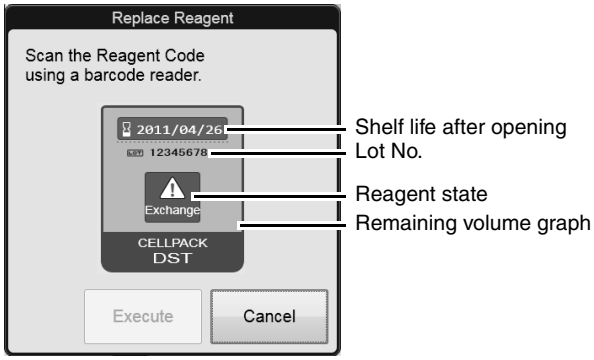
Follow the steps below to replace the reagent.

1 Display the RU-20 Maintenance menu.

(➤**P.13-4** "RU-20 Maintenance menu")

2 Click [Replace Reagent].

The following dialog box appears and displays the remaining level of CELLPACK DST reagent.



RU-20 [Replace Reagent] dialog box

Shelf life after opening	Display the shelf life of the reagent after opening. This is not displayed if the reagent has not been registered. When the shelf life after opening has expired, it displayed in white letter on a red background.
Lot No.	Displays the lot number of the reagent.
Reagent state	Displays the remaining reagent as a percentage. When the reagent runs low, the background becomes yellow.
Remaining volume graph	Displays the remaining volume of the reagent as a graph. This is not displayed if the reagent has not been registered, or if the reagent has run out.

3 Remove the cap from the new reagent container.

Check that the reagent has not expired.

4 Input the reagent code (barcode).

Input by barcode scanning

Scan the reagent code (barcode) on the outer box of the new reagent with hand-held barcode reader.
Reagent Code (barcode) is as shown the right illustration.

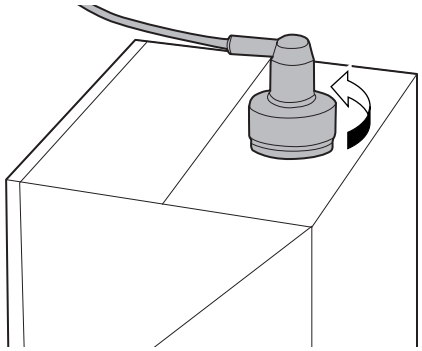
Manual input

Click the name of the reagent to be replaced in the [Reagent Replacement] dialog box.
Enter the reagent code (barcode) and click [OK].

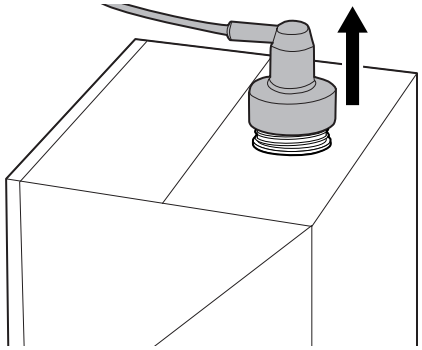
Note:

In case the reagent outer box label shows a "XN Reagent Code" barcode, please scan this barcode.

5 Remove the cap from the old reagent container.



6 Pull out the dispensing set straight up.



7 Insert the dispensing set straight into the new reagent container.

8 Close the cap.

9 Click [Execute].

The replacement of the reagent starts. Wait until it is complete. When it is complete, the dialog box closes automatically.

Note:

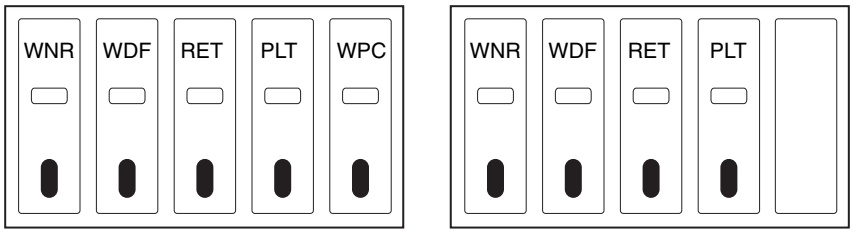
The RU-20 [Replace Reagent] dialog box can also be displayed by the method below.
- Click [OK] in the Help dialog that appears when insufficient CELLPACK DST remains.
- Click the reagent level display in the RU area of the control menu.

13.4.5 Replace a new dye

This section explains how to replace the following reagents.

- Fluorocell WNR, Fluorocell WDF, Fluorocell WPC
- Fluorocell RET
- Fluorocell PLT

For cautions while replacing reagents, see Chapter 5. (➤**P.5-1** "Chapter 5: Reagents")
Install the dye cartridge in its corresponding dye cartridge holder. The dye cartridge holder that can be install will vary depending on the analyzer types. The position of each dye cartridge holder is shown below.



XN-20 **XN-10**

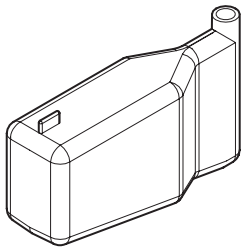
Follow the steps below to replace the reagent.

1 Display the [Reagent Replacement] dialog box.

(➤**P.13-32** "13.4.2 About [Reagent Replacement] dialog box")

2 Prepare the new reagent cartridge.

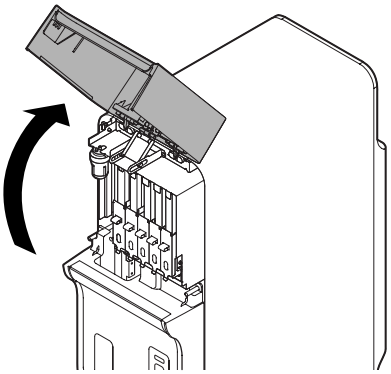
Check that the reagent has not expired.
For the details on new reagent cartridge, see below.
(➤**P.13-32** "13.4.1 List of reagents")



e.g.) Fluorocell WDF

3 Open the top front cover.

Open to the highest point. It may move down.

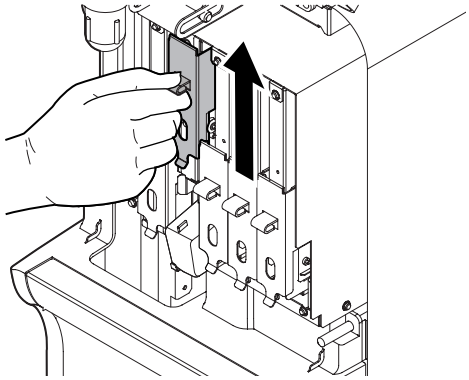


Caution!

During analysis and other times when the analyzer is in operation, never open the top front cover.

4 Pull up the cover from the reagent that is to be replaced.

Pull firmly until all the way up.

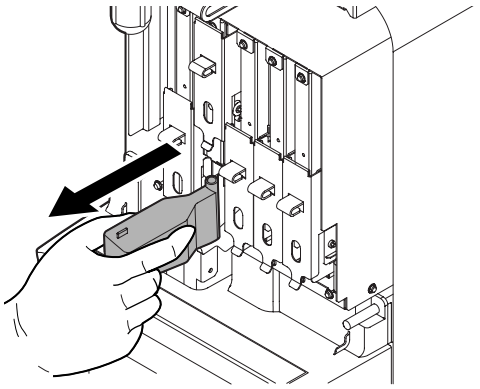


e.g.) XN-20

Note:

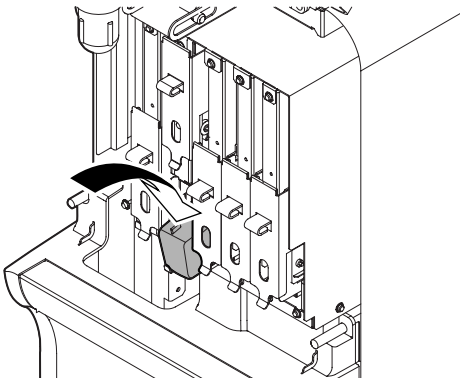
When the dye solution cover is pulled up, a Help dialog box appears in the IPU screen. Proceed to the next step. When the dye solution cover is pushed down in step 7, the Help dialog box closes.

5 Remove the old reagent cartridge from its holder.



6 Install the new reagent cartridge into the holder.

Make sure that the color of the label on the new reagent cartridge matches the color of the dye cover, and install as shown at right.
The analyzer beeps.



⚠ Caution!

- If you install a different reagent, the analyzer beeps repeatedly and Help dialog box appears in the IPU screen.
- If dye solution spills, immediately wipe it off using wet cloth or the like. Otherwise, the coated surface of the instrument could be stained.

7 Pull down the cover on the reagent.

Pull down until you hear a "click" sound.
The ID of the new reagent is read automatically, and the information is registered.

8 Close the top front cover.

The replacement of the reagent starts. Wait until it is complete. When it is complete, the window closes automatically.

13.4.6 Replenish reagents

Replenish analyzer reagents

If you encounter an error with the dye solution, or if you set the wrong reagent, you can replenish the reagent. Follow the steps below to replenish the reagent.

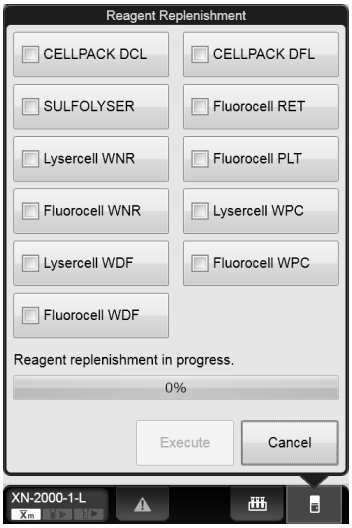
1 Make sure that the reagent you want to replace is connected.

2 Display the Maintenance menu.

(➤**P.13-2** "13.1.2 Maintenance menu")

3 Click [Reagent Replenishment].

The dialog box on the right appears.



4 Click the name of the reagent to replenish, and click [Execute].

The replenishing of the reagent begins. Progress is shown as a progress bar on the screen. Wait until it is complete. When it is complete, the dialog box closes automatically.

Note:

Multiple reagents can be replaced at once.

Replenish the reagent in the RU-20 (Replacing the reagent in the RU-20 instrument and supply tank)

When using the RU-20, follow the steps below to replace the reagent in the RU-20.
Perform this procedure if the concentrated reagent in the RU-20 has expired or the wrong reagent was accidentally connected.
This procedure can be used to drain the concentrated reagent from the RU-20 and replace it with new CELLPACK DST, and drain the prepared reagent from the supply tank and replace it with reagent prepared using new CELLPACK DST.
Follow the steps below to replenish the reagent.

1 Make sure that the reagent you want to replace is connected.

2 Display the RU-20 Maintenance menu.

(➤**P.13-4** "RU-20 Maintenance menu")

3 Click [Reagent Replenishment].

The dialog box appears.

4 Click [Execute].

The dialog box automatically closes, [Maintenance in progress] appears in the operation status display area of the help dialog box, and reagent replacement begins. For the operation status display area, see Chapter 14.
(➤**P.14-2** "Chapter 14: 14.1.2 Help dialog box")
Wait until it is complete. Reagent replacement takes about 4 to 6 hours. When it is complete, [Maintenance in progress] disappears.

5 Click [Cancel].

The dialog box closes.

13.4.7 Drain the reagent

Draining analyzer reagent

If the reservoir tank is being used, reagent can be drained and the reservoir tank automatically cleaned in the event that the reagent in the tank has expired or the wrong reagent was taken in.
Follow the procedure below to drain the reagent.

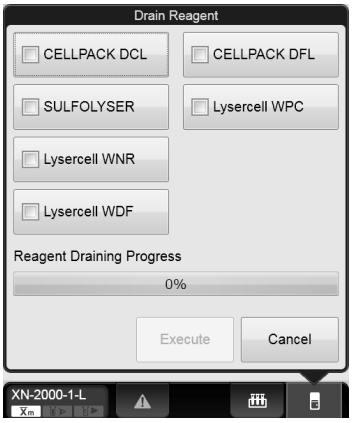
1 Make sure that the reagent you want to reconnect is connected.

2 Display the Maintenance menu.

(➤**P.13-2** "13.1.2 Maintenance menu")

3 Click [Drain Reagent].

The dialog box on the right appears.



4 Click the name of the reagent that you wish to drain and click [Execute].

Draining starts. Progress is shown as a progress bar on the screen. Wait until it is complete. When it is complete, the dialog box closes automatically.

Note:

Multiple reagents can be drained at once.

RU-20 reagent draining (Replacing the reagent in the RU-20 instrument)

When using the RU-20, follow the steps below to replace the reagent from in the RU-20.
If the concentrated reagent in the RU-20 has expired or the wrong reagent was accidentally connected, the concentrated reagent in the RU-20 can be drained and replaced with new CELLPACK DST.
Follow the procedure below to drain the reagent.

1 Make sure that the reagent you want to reconnect is connected.

2 Display the Maintenance menu.

(➤**P.13-4** "RU-20 Maintenance menu")

3 Click [Drain Reagent].

The dialog box appears.

4 Click [Execute].

The dialog box automatically closes, [Maintenance in progress] appears in the operation status display area of the help dialog box, and reagent draining begins. For the operation status display area, see Chapter 14. (➤**P.14-2** "Chapter 14: 14.1.2 Help dialog box") Wait until it is complete. Reagent draining takes about 1 hour. When it is complete, [Maintenance in progress] disappears.

5 Click [Cancel].

The dialog box closes.

13.4.8 Check the reagent replacement history

The history of reagent replacements can be viewed. The log data shows the information entered at the time of replacement, and comments can be entered. The log can be printed or output as a file in CSV format.
For the details, see the following.
(➤**P.13-68** "13.6 About the history screen", **P.13-76** "13.7 About the RU history screen")

13.5 Replace supply parts

This section explains how to replace supply parts.

13.5.1 Replace supply parts

This section explains how to replace the supply parts below.

Part Number	Description	Reference
AN965961	ASP_Assy (PM) No.8	➤**P.13-48** "13.5.2 Replace the piercer"
266-7768-1	Fuse 50T100H (Main Unit, 100- 240V Specifications / 250V 10A, Time Lag, Low breaking capacity)	➤**P.13-60** "13.5.3 Replace the fuse"
266-5011-3	Fuse STA-4A-N1 (Pneumatic Unit, 100-117V Specifications / 250V 4A, Time Lag)	
266-5293-0	Fuse No. 19195 (Pneumatic Unit, 220-240V Specifications / 250V 3.15A, Time Lag)	
AX880901	Fuse 50T032H (Transportation unit (Excluding conveyor extension), 250V 3.15A, Time Lag)	
BV354044	Fuse 50T040H (Conveyor extension, 250V 4A, Time Lag)	

13.5.2 Replace the piercer

When the number of piercing actions exceeds 120,000, the help dialog box appears in the IPU. Continue use without replacing the piercer will cause the tip of the needle to wear and break.
Therefore, replace the piercer according to the steps below.

> **Note:**
> Depending on the condition in which the device is used, the piercer may wear down before 120,000 counts of piercing. If the piercer is damaged in any way, replace it immediately.

Removing the old piercer

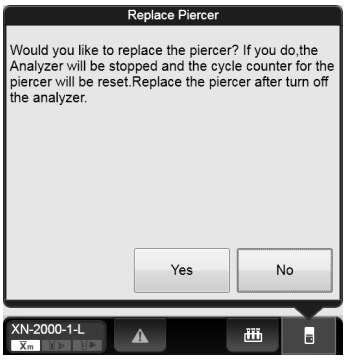
Follow the steps below to remove the old piercer.

1 Display the Maintenance menu.

(➤**P.13-2** "13.1.2 Maintenance menu")

2 Click [Replace Piercer].

The dialog box on the right appears.

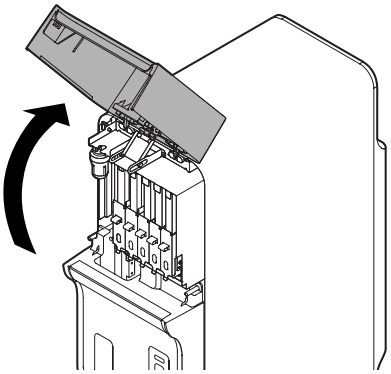


3 Click [Yes].

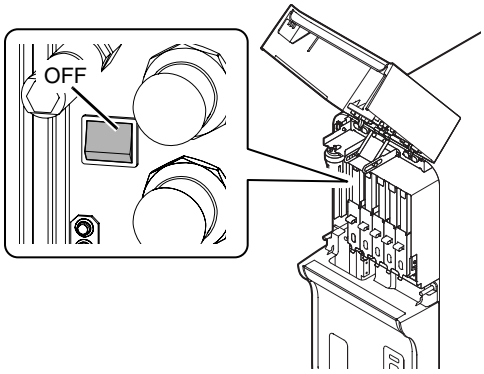
The piercer operation count is reset and the piercer moves to the replacement position. Wait until it is complete. When it is complete, the dialog box closes automatically.

4 Open the top front cover.

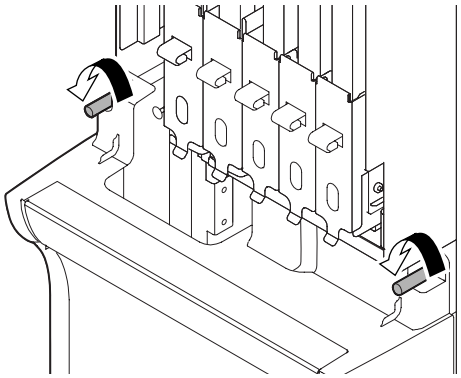
Open to the highest point. It may move down.



5 Turn OFF the Main power switch.



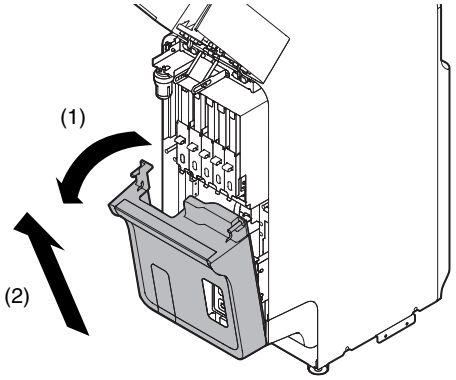
6 Remove the screws of the bottom front cover.



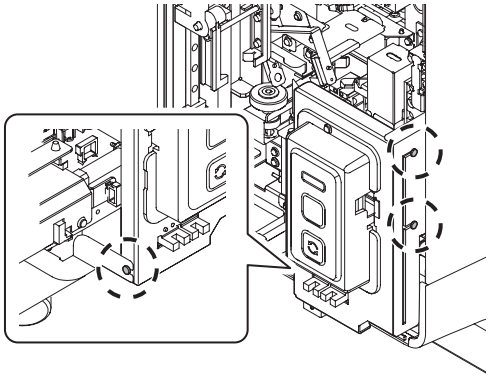
7 Remove the bottom front cover.

1 Tilt forward and down the front cover.

2 Lift up the front cover, and remove it.

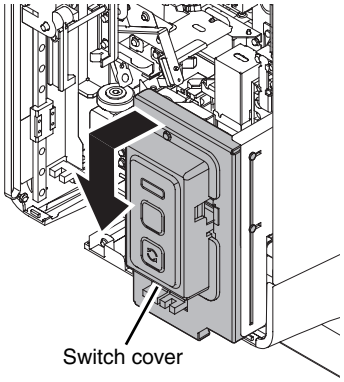


8 Loosen the screws (x3) on the switch cover.



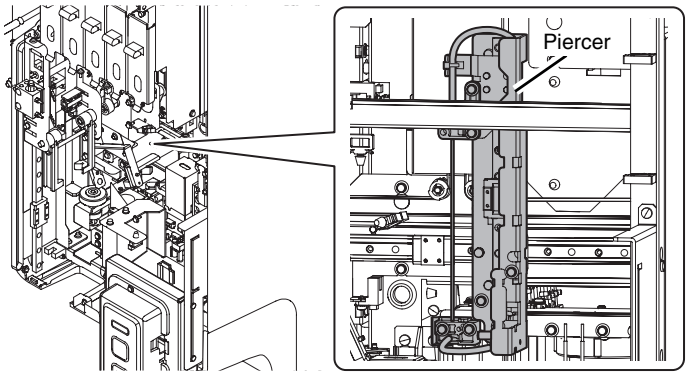
9 Pull down the switch cover.

Pull out and then pull down.

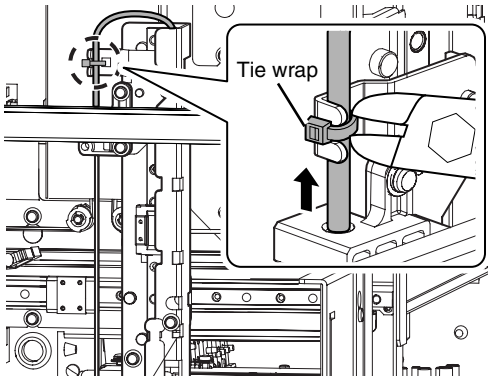


10 Make sure that the piercer moves.

Check that the piercer has moved to a replaceable position (see right illustration).



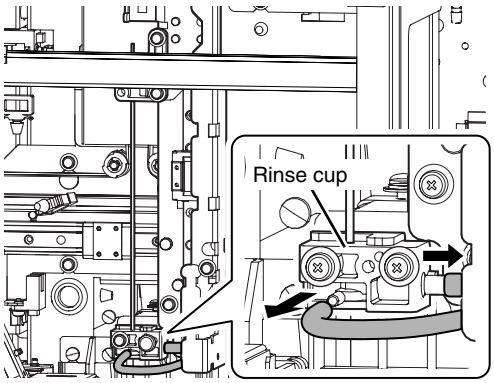
11 Cut the tie wrap holding the tube protruding from the top of the piercer and remove the tube.



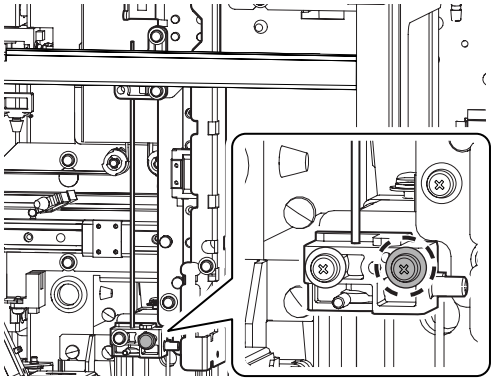
Information

2 layers of tubes are used in some places. Remove both layers at once.

12 Disconnect the rinse cup (bottom of piercer) tube.

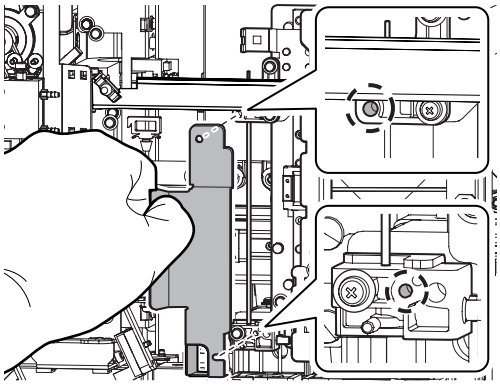


13 Remove the screw on the right side of the rinse cup.

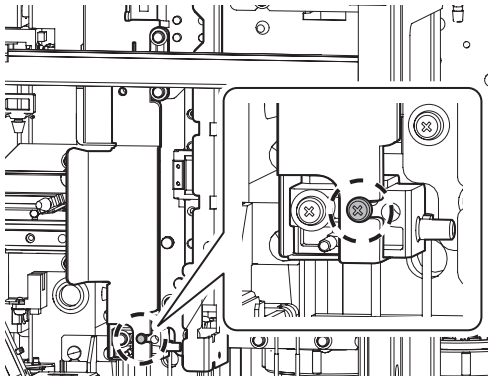


14 Install the replacement metal plate.

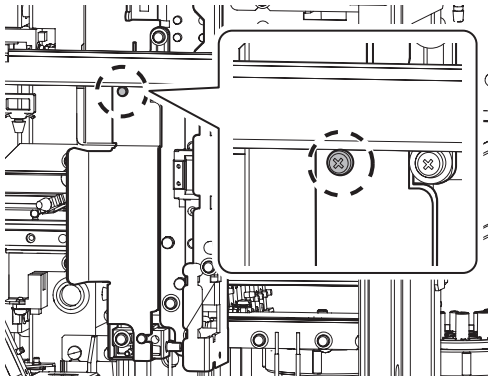
Place so that the slit in the metal plate is aligned with the center hole in the rinse cup and the upper hole in the piercer.



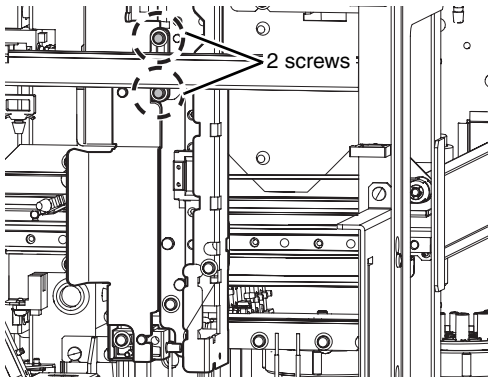
15 Tighten the screw on the lower part of the metal plate.



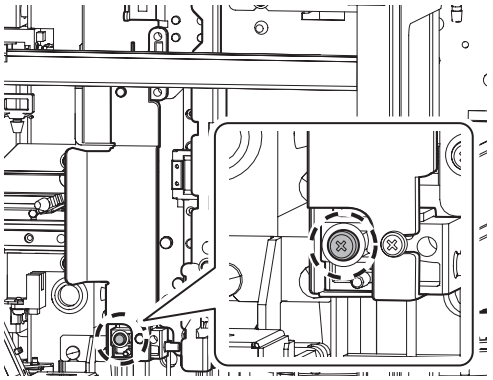
16 Tighten the screw on the upper part of the metal plate.



17 Remove the screws on the piercer (2 places).

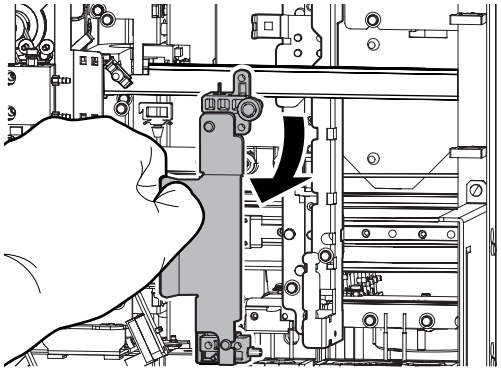


18 Remove the screw on the rinse cup.



19 Remove the piercer.

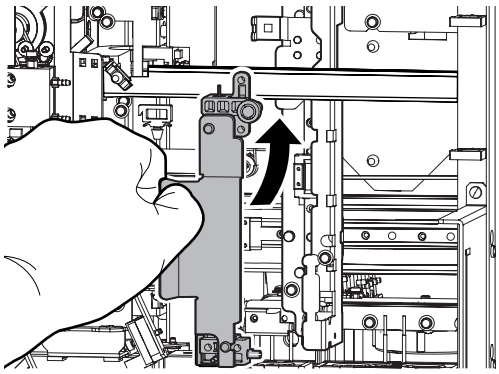
For disposing a piercer that has been removed, see Chapter 2.
(➤**P.2-4** "Chapter 2: 2.8 Disposal of materials")



Attaching a new piercer

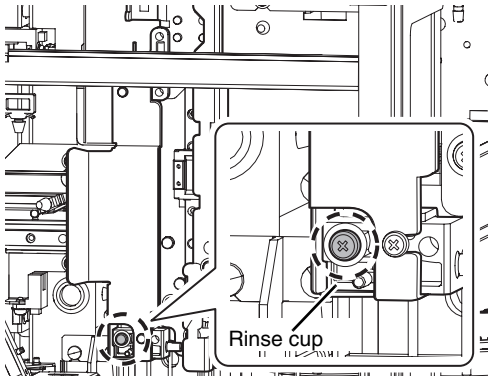
Follow the steps below to attach the new piercer.

1 Set the new piercer.

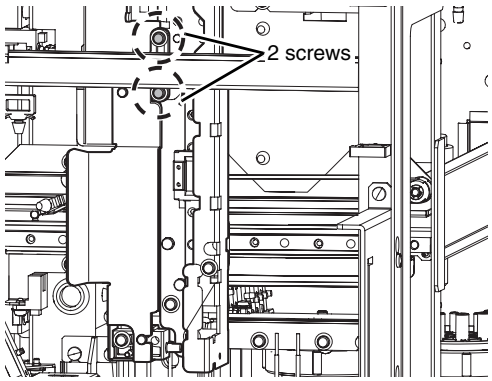


2 Loosely fasten the rinse cup with a screw.

Keep the screw loose.

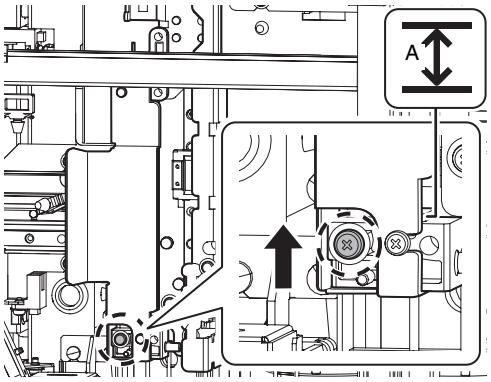


3 Tighten the screws on the piercer (2 places).

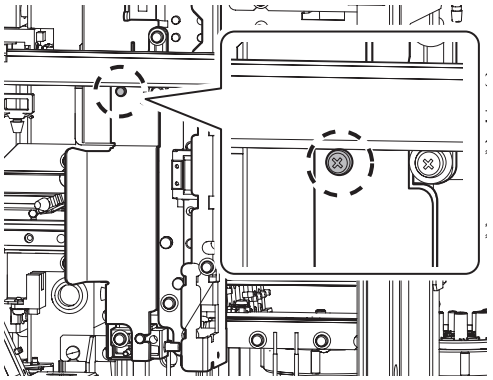


4 Tighten the loose screw from step 2.

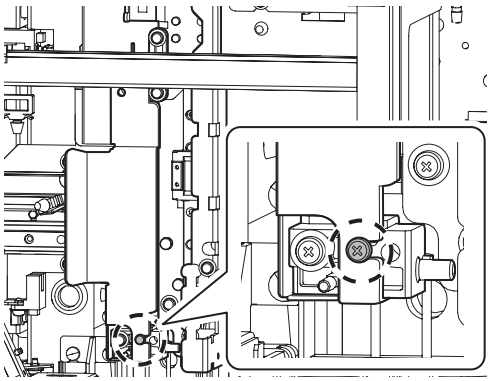
Tighten the screw by holding up the rinse cup, so that there is not gap (A).



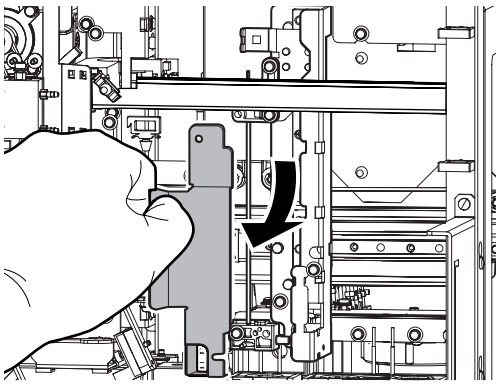
5 Remove the screw from the upper part of the metal plate.



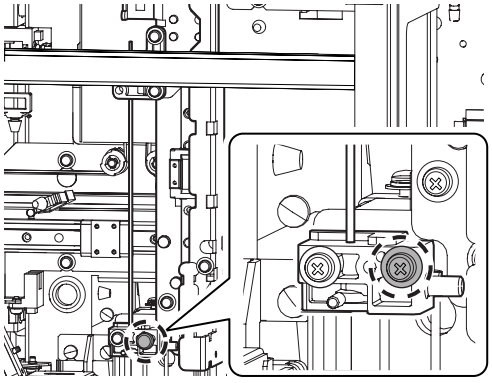
6 Remove the screw from the lower part of the metal plate.



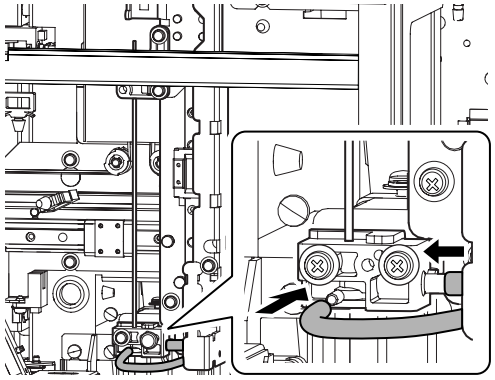
7 Remove the metal plate.



8 Tighten the screw on the right side of the rinse cup.

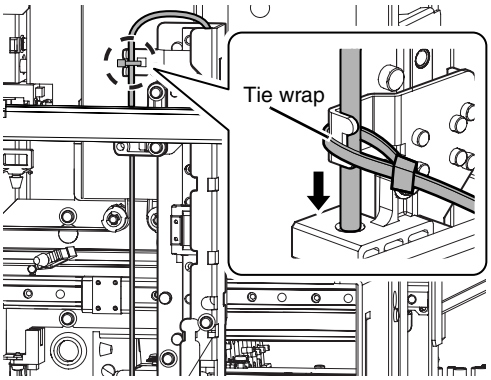


9 Attach the 2 tubes to the rinse cup.



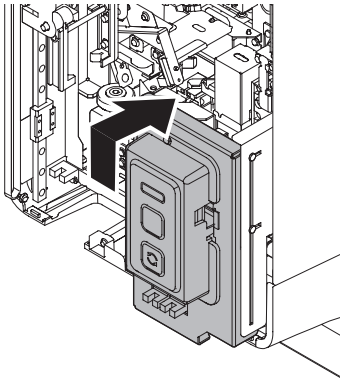
10 Attach the tube above the piercer and fasten with a tie wrap.

Be careful not to block the tube when binding the tie wraps. Cut off the excess tie wrap.

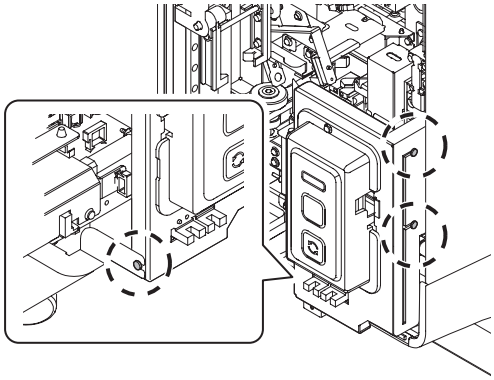


11 Set the switch cover.

Pull firmly until all the way top and tuck into the rear.



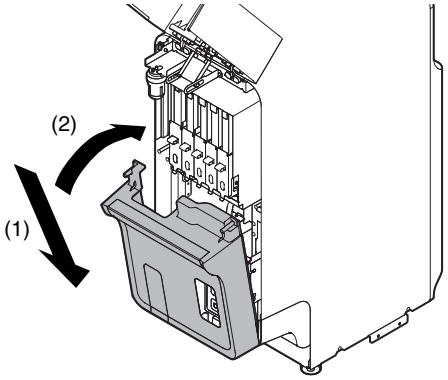
12 Tighten the screws (x3) on the switch cover.



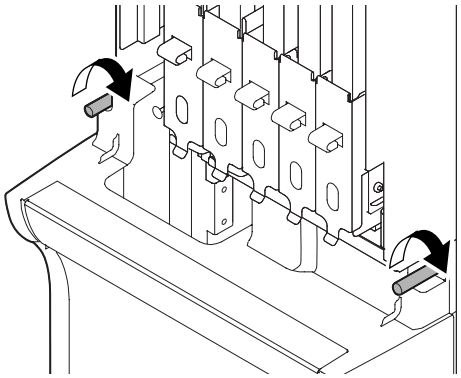
13 Set the bottom front cover.

1 Align the lower protrusion on the analyzer with the protrusion on the front cover.

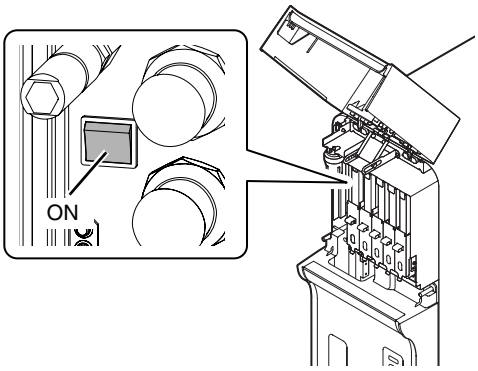
2 Tilt down toward the analyzer to attach.



14 Tighten the screws of the bottom front cover.



15 Turn ON the Main power switch.



16 Close the top front cover.

17 Turn ON the analyzer's power.

For procedures to restart the analyzer, see Chapter 6. (➤**P.6-30** "Chapter 6: 6.8 Restart the analyzer")

13.5.3 Replace the fuse

If a fuse blows, replace the fuse. The replacement procedure varies depending on the device.

⚠ Warning!

- Make sure to unplug the power cable when replacing a fuse.
  This is to avoid the risk of electrical shock.
- Make sure to only use a fuse of the specified type and rating.
  This is to avoid the risk of fire.

To replace the fuse for an analyzer

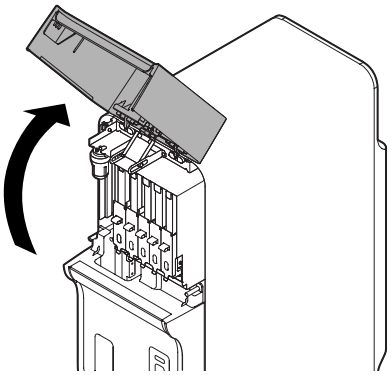
Follow the steps below to replace the fuse in the analyzer.

1 Turn OFF the power to the entire device.

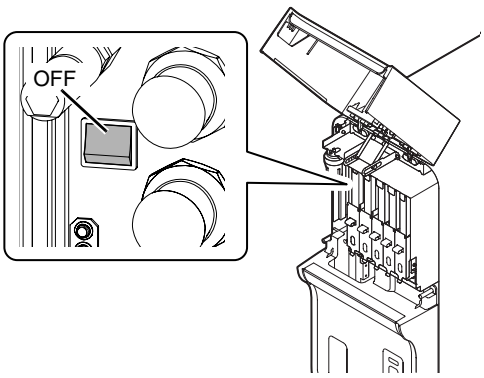
For shutdown procedures, see Chapter 6. (➤**P.6-23** "Chapter 6: 6.7 Shutdown")

2 Open the top front cover.

Open to the highest point. It may move down.

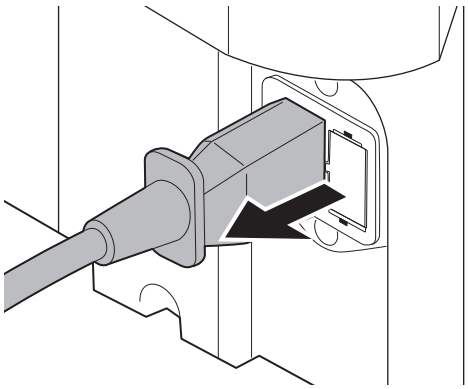


3 Turn OFF the Main power switch of the analyzer.



4 Unplug the power cable from the rear side of the main unit.

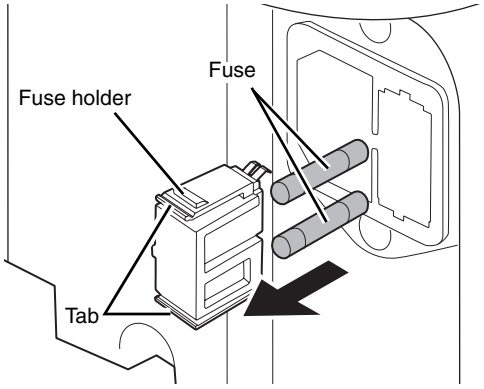
For locations of the power cable plug and the fuse on each device, see Chapter 4.
(➤**P.4-1** "Chapter 4: 4.1 Analyzer")



5 Remove the old fuse.

1 On the rear of the unit, pinch the tabs of the fuse holder and pull out forward.

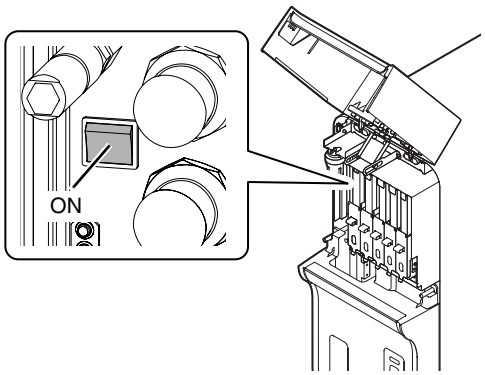
2 Remove the old fuse from the fuse holder.



6 Set the new fuse into the fuse holder, and insert it into the unit.

7 Plug in the power cable.

8 Turn ON the Main power switch of the analyzer.



9 Close the top front cover.

10 Turn ON the power to the device.

For the details on starting the device, see Chapter 6. (➤**P.6-15** "Chapter 6: 6.4 Start up")

To replace the fuse for a pneumatic unit

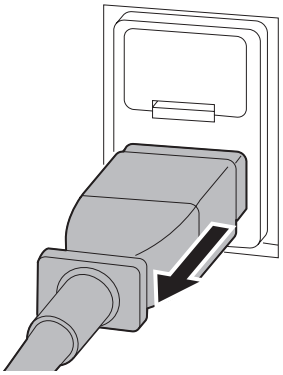
Follow the steps below to replace the fuse in the pneumatic unit.

1 Turn OFF the power to the entire device.

For shutdown procedures, see Chapter 6. (➤**P.6-23** "Chapter 6: 6.7 Shutdown")

2 Unplug the power cable from the rear side of the main unit.

For locations of the power cable plug and the fuse on each device, see Chapter 4.
(➤**P.4-4** "Chapter 4: 4.2 Pneumatic unit")

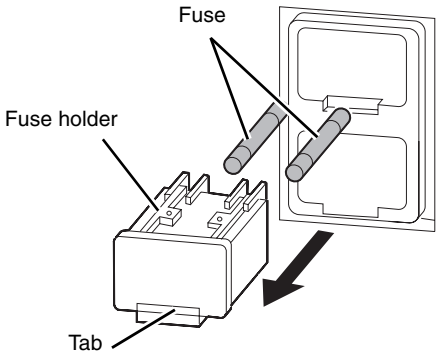


3 Remove the old fuse.

1 On the rear of the unit, pull out the fuse holder forward.

Use a flathead screwdriver to push up on the hook part of the fuse holder, and withdraw the fuse holder.

2 Remove the old fuse from the fuse holder.



4 Set the new fuse into the fuse holder, and insert it into the unit.

5 Plug in the power cable.

6 Turn ON the power to the device.

For the details on starting the device, see Chapter 6. (➤**P.6-15** "Chapter 6: 6.4 Start up")

To replace the fuse for transportation units (Excluding conveyor extension)

Follow the steps below to replace a fuse in transportation units (excluding the extension conveyor).

1 Turn OFF the power to the entire instrument.

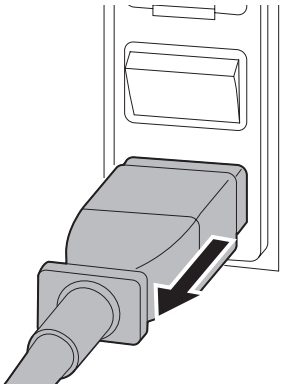
For shutdown procedures, see Chapter 6. (➤**P.6-23** "Chapter 6: 6.7 Shutdown")

2 Turn OFF the Main power switch.

For the location of the main power switch, see Chapter 4.
(➤**P.4-6** "Chapter 4: 4.4 Transportation units")

3 Unplug the power cable from the rear side of the main unit.

For locations of the power cable plug and the fuse on each device, see Chapter 4.
(➤**P.4-6** "Chapter 4: 4.4 Transportation units")

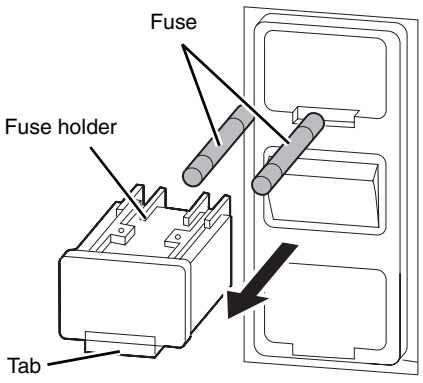


4 Remove the old fuse.

1 On the rear of the unit, pull out the fuse holder forward.

Use a flathead screwdriver to push up on the hook part of the fuse holder, and withdraw the fuse holder.

2 Remove the old fuse from the fuse holder.



5 Set the new fuse into the fuse holder, and insert it into the unit.

6 Plug in the power cable.

7 Turn ON the Main power switch.

8 Turn ON the power to the instrument.

For procedures on starting the instrument, see Chapter 6. (➤**P.6-15** "Chapter 6: 6.4 Start up")

To replace the fuse for a conveyor extension (CV-70)

Follow the steps below to replace the fuse in the pneumatic unit or extension conveyor (CV-70).

1 Turn OFF the power to the entire device.

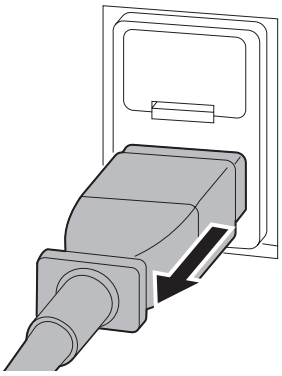
For shutdown procedures, see Chapter 6. (➤**P.6-23** "Chapter 6: 6.7 Shutdown")

2 Turn OFF the Main power switch.

For the location of the main power switch, see Chapter 4.
(➤**P.4-6** "Chapter 4: 4.4 Transportation units")

3 Unplug the power cable from the rear side of the main unit.

For locations of the power cable plug and the fuse on each device, see Chapter 4.
(➤**P.4-6** "Chapter 4: 4.4 Transportation units")

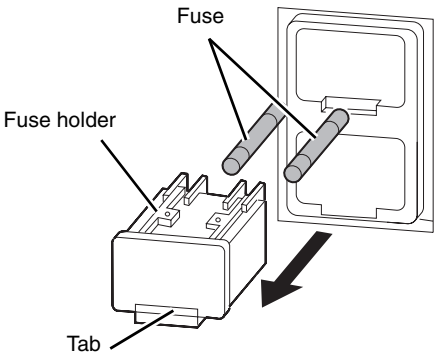


4 Remove the old fuse.

1 On the rear of the unit, pull out the fuse holder forward.

Use a flathead screwdriver to push up on the hook part of the fuse holder, and withdraw the fuse holder.

2 Remove the old fuse from the fuse holder.



5 Set the new fuse into the fuse holder, and insert it into the unit.

6 Plug in the power cable.

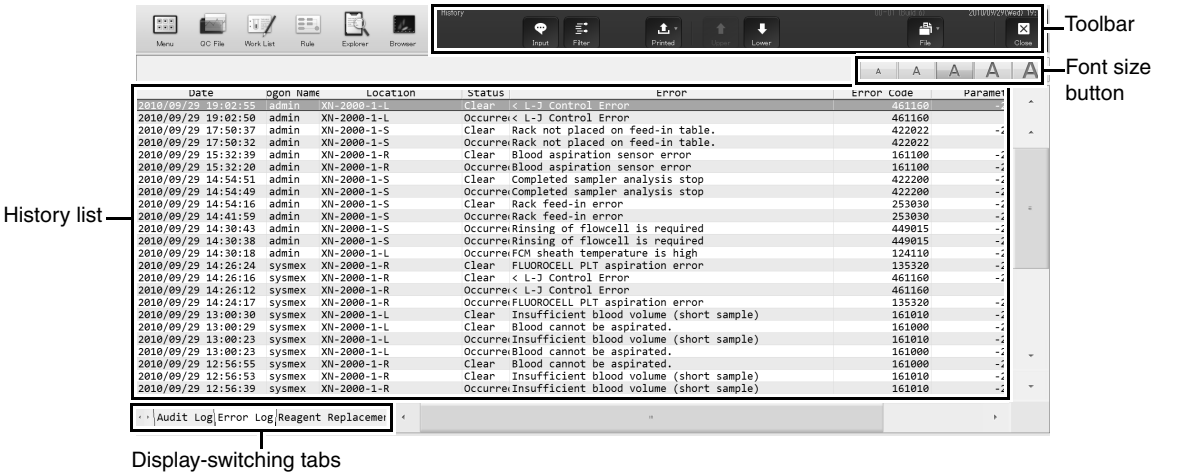
7 Turn ON the Main power switch.

8 Turn ON the power to the device.

For the details on starting the device, see Chapter 6. (➤**P.6-15** "Chapter 6: 6.4 Start up")

13.6 About the history screen

Clicking the [History] icon in the Menu screen displays the following screen.
In the following screen, the error log tab appears.



[History] screen

Toolbar

[Input]	Click to display a dialog box that allows you to enter a comment. You can enter up to 50 characters. Once the comment is entered, it cannot be edited or deleted. If there is an existing comment, any new comments entered are appended after the previously entered comment.
[Filter]	Click to display a dialog that allows you to specify the conditions for the data you want displayed in the history list.
[Output]	Click to display a submenu that allows you to specify the output destination.
[Upper]	Click to move up one data.
[Lower]	Click to move down one data.
[File]	Click to display a submenu that allows you to save and restore data.
[Close]	Click to close the [History] screen.

Font size button

To change the size of the characters and the line height in the sample list, click the character size button.
When you change the size setting of the characters, see "Administrator's Guide".
(➤Administrator's Guide, "Chapter 4: 4.3.3 Display settings")

Navigating the screen

You can switch between the screens by clicking the display-switching tab.

13.6.1 About the history list

The items in the history list change depending on which tab is selected.

● Operation history screen

Displays a history of operations performed in the device.
A maximum of 5000 entries are stored and displayed in the operation history. The operation history tab is similar to the error log tab. For the details on the display of the error log tab, see below.
(➤**P.13-68** "13.6 About the history screen")

[Date]	Displays the date and time at which the history data was registered.
[Logon Name]	Displays the user name that was logged in when the history data was registered.
[Operation Name]	Displays the name of the operation performed.
[Details]	Displays the details of the operation performed.
[Comments]	Click to display a dialog box that allows you to enter a comment. You can enter up to 50 characters. Once the comment is entered, it cannot be edited or deleted. If there is an existing comment, any new comments entered are appended after the previously entered comment.

The history list displays the following operators under respective conditions.

Operator	Display condition
[Logon]	When a user logs on.
[Logoff]	When a user logs off.
[Modify Sample No.]	When the sample number of an analysis data is modified.
[Modify Pos. -> Neg.]	When the judgment of an analysis data is changed from Positive to Negative.
[Modify Neg. -> Pos.]	When the judgment of an analysis data is changed from Negative to Positive.
[Modify Sample Inf.]	When the sample information of an analysis data is modified.
[Modify Patient ID]	When the patient ID of an analysis data is modified.
[Delete Analysis Data]	When an analysis data is deleted*1.
[Register QC File]	When a QC file is registered.
[Modify QC Lot]	When QC lot attributes (expiration date and lot number) are changed.
[Modify QC Target/ Limit]	When a QC target is changed.
[Delete QC File]	When a QC file is deleted.
[Delete QC Plot]	When a QC plot is deleted.
[Delete Analysis Registration]	When an analysis order is deleted*1.
[Execute Calibration]	When a compensation rate is changed.
[Change Settings]	When a setting is changed in the [IPU Setting] or [Analyzer Setting] dialog box.
[Restore Setting]	When a saved setting is restored in the [IPU Setting] or [Analyzer Setting] dialog box.

Operator	Display condition
[Initialize Setting]	When a setting is initialized in the [IPU Setting] or [Analyzer Setting] dialog box.
[Register Rule]	When a rule is registered in the rules screen.
[Modify Rule]	When a rule is modified in the rules screen.
[Delete Rule]	When a rule is deleted in the rules screen.
[Restore Rule]	When a saved rule is restored in the rules screen*2.
[Initialize Rule]	When a rule is initialized in the rules screen.
[Enable Rule Setting]	When a setting for a rule is enabled.
[Disable Rule Setting]	When a setting for a rule is disabled.

*1 A deletion is not logged if a data was automatically deleted because the maximum number of registered data was exceeded.

*2 The history is displayed by rule type.

● Error Log screen

A history of errors that occurred is displayed with information at the time of occurrence and clearance.
A maximum of 5000 entries are stored and displayed in the error log. For the details on the display of the error log tab, see below.
(➤**P.13-68** "13.6 About the history screen")

[Date]	Displays the date and time at which the history data was registered.
[Logon Name]	Displays the user name that was logged in when the history data was registered.
[Status]	Displays the status of the error that occurred. [Occurred]: Error [Clear]: Error cleared
[Error]	Displays the message of the error that occurred.
[Error Code]	Displays the error code of the error that occurred.
[Parameter1]/ [Parameter2]	Displays parameter 1 and parameter 2 of the error that occurred. Depending on the type of error, this field may be blank.
[Location]	Displays the name of location where the error occurred.
[Comments]	Click to display a dialog box that allows you to enter a comment. You can enter up to 50 characters. Once the comment is entered, it cannot be edited or deleted. If there is an existing comment, any new comments entered are appended after the previously entered comment.

For details on errors, see Chapter 14.
(➤**P.14-1** "Chapter 14: Troubleshooting")

● Reagent Replacement Log screen

Displays a history of reagent replacement, and any information that was entered at the time of replacement. A maximum of 5000 entries are stored and displayed in the reagent replacement log. The reagent replacement log tab is similar to the error log tab. For the details on the display of the error log tab, see below.
(➤**P.13-68** "13.6 About the history screen")

[Date]	Displays the date and time at which the history data was registered.
[Logon Name]	Displays the user name that was logged in when the history data was registered.
[Analyzer Nickname]	Displays the name of the analyzer for which the reagent was replaced.
[Reagent]	Displays the name of the replaced reagent.
[Lot No.]	Displays the lot number of the replaced reagent.
[Serial No.]	The serial number within the lot of the replaced reagent appears.
[Exp. Date]	Displays the expiration date of the replaced reagent.
[Exp. date after opening]	Displays the shelf life of the replaced reagent after it has been opened.
[Amounts]	If a diluent or a hemolytic agent was replaced, the amount of the replaced reagent is displayed. If a dye was replaced, the number of tests for the replaced reagent is displayed.
[Entry Type]	Displays the method of input for the replaced reagent. [Manual]: Manual [Barcode]: Barcode reader [RFID]: ID reader of the dye
[ProductCode]	Displays the entered part code.
[Manufacturer]	Displays the entered manufacturer.
[Address]	Displays the entered manufacturer's address.
[Comments]	Click to display a dialog box that allows you to enter a comment. You can enter up to 50 characters. Once the comment is entered, it cannot be edited or deleted. If there is an existing comment, any new comments entered are appended after the previously entered comment.

For details on replacing reagents, see the following:
(➤**P.13-32** "13.4 Replace reagents")

● Maintenance Log screen

Displays a history of maintenance tasks executed with information at the time of execution.
A maximum of 5000 entries are stored and displayed in the maintenance log. The maintenance log tab is similar to the error log tab. For the details on the display of the error log tab, see below.
(➤**P.13-68** "13.6 About the history screen")

[Date]	Displays the date and time at which the history data was registered.
[Logon Name]	Displays the user name that was logged in when the history data was registered.
[Nickname]	Displays the name of the analyzer for which the maintenance task was executed.
[Maintenance]	Displays the name of the maintenance task executed.
[Maintenance Property]	Displays the attributes of the maintenance task executed.
[Comments]	Click to display a dialog box that allows you to enter a comment. You can enter up to 50 characters. Once the comment is entered, it cannot be edited or deleted. If there is an existing comment, any new comments entered are appended after the previously entered comment.

A maintenance log entry is registered when the following maintenance task is performed.
The following are the maintenance tasks and attributes displayed.

Maintenance Task	Maintenance Attributes
Auto Rinse	As needed
Cleaning	As needed
Shutdown	Daily
Drain Waste Chamber	As needed
Rinse Waste Chamber	As needed
Remove Air Bubbles	As needed
Rinse Flowcell	As needed
Drain Reaction Chamber	As needed
Drain RBC Isolation Chamber	As needed
Remove Clogs	As needed
Reagent Replenishment	As needed
Drain Reagent	As needed
Reset Piercer Operation Cycle Count	Replace Parts
Adjust Pressure	As needed
Replace Piercer	Replace Parts

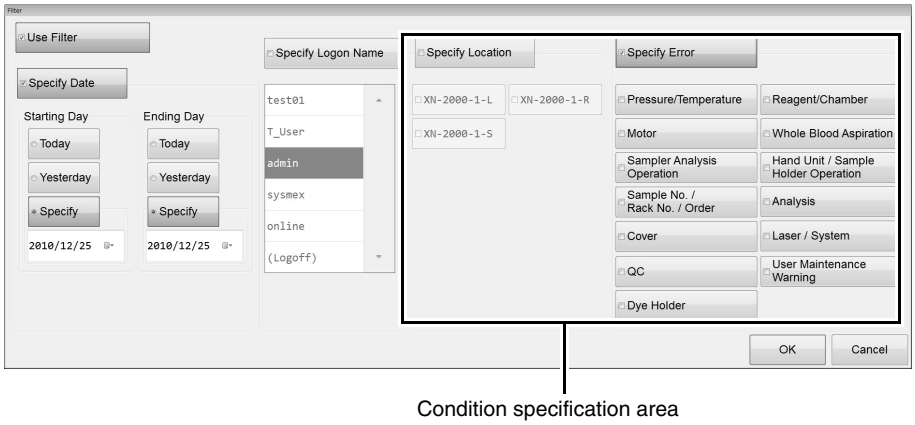
For details on maintenance, see the following:
(➤**P.13-1** "13.1.1 List of maintenance items")

13.6.2 Specify conditions for the history to display (filter)

You can specify conditions for the log entries you want displayed in the history list.
Follow the steps below to specify conditions for the log entries you want displayed.

1 Click the [Filter] button on the toolbar.

The following dialog box appears.



Condition specification area

e.g.) Filter of Error log

2 Populate the displayed fields.

The following items are displayed in the dialog box.

[Use Filter]	Selecting this check box will display only the log entries that match the specified conditions. If you clear the check box, the settings will be grayed out and cannot be selected.
[Specify Date]	Select this check box to restrict the data to display by date.
[Starting Day]/ [Ending Day]	Click to select [Today], [Yesterday] or [Specify]. Selecting [Specify] allows you to specify the date. In the field below [Specify], enter the date in the format "Year (four digits)/Month (two digits)/Date (two digits)". You cannot enter double-byte characters. If you click the button on the right edge of the input field, a calendar appears. You can also enter the date by selecting from this calendar.
[Specify Logon Name]	Select this check box to specify the data to display by logon name. Click to select the logon name to display. You can only select one user.
Condition specification area	The displayed buttons are different depending on the displayed screen. By selecting the check box displayed at the top, you can use the condition displayed on the button. Below each button, items that can be selected by each condition are displayed.
[Specify Operation]	Displayed when the operation history screen is open. Select this check box to restrict the data to display by operation name. Selecting the check box below the button displays the selected operation name. You can select multiple operators.

[Specify Location]	Displayed when the error history screen is open. Select this check box to restrict the data to display by location. Selecting the check box below the button displays the selected location. You can select multiple locations.
[Specify Error]	Displayed when the error history screen is open. Select this check box to restrict the data to display by error type. Selecting the check box below the button displays the selected error type. You can select multiple error types.
[Specify Analyzer]	Displayed when the reagent replacement screen or maintenance log screen is open. Select this check box to restrict the data to display by analyzer. Selecting the check box below the button displays the selected analyzer. You can select multiple analyzers.
[Specify Reagent]	Displayed when the Reagent Replacement Log screen is open. Select this check box to restrict the data to display by reagent. Selecting the check box below the button displays the selected reagent. You can select multiple reagents.
[Specify Maintenance]	Displayed when the Maintenance Log screen is open. Select this check box to restrict the data to display by maintenance type. Selecting the check box below the button displays the selected maintenance type. You can select multiple maintenance types.

3 Click [OK].

The dialog box closes.
The log entries that match the specified conditions are displayed in the history list.

13.6.3 Output history to a printer

You can output the history list to a connected printer.
Click the [Output] button - [Ledger (LP)] on the toolbar. The history list is output from the ledger printer.

13.6.4 Save history in CSV format.

You can save the history list as a CSV file.
Follow the steps below to save the history in CSV format.

1 Click the [File] button - [Output in CSV Format] on the toolbar.

The [Save As] dialog box appears.

2 Specify the folder to save to, or create a new folder.

3 Enter a file name.

The file extension is ".csv".

4 Click [Save].

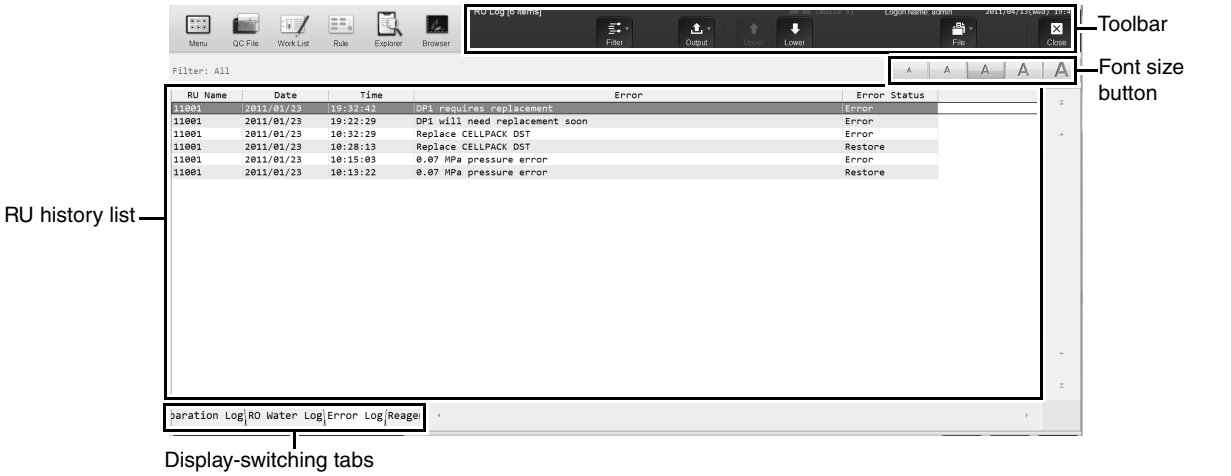
The CSV data is saved.

Note:

When the dialog box opens, the files names are pre-entered as follows:
- XN_SoftwareVersion_AUDITLOG.csv (Operation history)
- XN_SoftwareVersion_ERRORLOG.csv (Error Log)
- XN_SoftwareVersion_REAGENTLOG.csv (Reagent Replacement Log)
- XN_SoftwareVersion_MAINTENANCELOG.csv (Maintenance Log)

13.7 About the RU history screen

Clicking the [RU history] icon in the Menu screen displays the following screen.
In the following screen, the error log tab appears.



[RU history] screen

Toolbar

[Filter]	Click to display a dialog that allows you to specify the conditions for the data you want displayed in the RU history list.
[Output]	Click to display a submenu that allows you to specify the output destination.
[Upper]	Click to move up one data.
[Lower]	Click to move down one data.
[File]	Click to display a submenu that allows you to save and restore data.
[Close]	Click to close the [RU history] screen.

Font size button

To change the size of the characters and the line height in the sample list, click the character size button.
When you change the size setting of the characters, see "Administrator's Guide".
(➤Administrator's Guide, "Chapter 4: 4.3.3 Display settings")

Navigating the screen

You can switch between the screens by clicking the display-switching tab.

13.7.1 About the RU history list

The items in the RU history list change depending on which tab is selected.

● Preparation history screen

Displays a history of reagent preparation performed on the RU and related information.
A maximum of 2000 entries are stored and displayed in the preparation history. The preparation history log tab is similar to the error log tab. For the details on the display of the error log tab, see below.
(➤**P.13-76** "13.7 About the RU history screen")

[RU Name]	Name of the RU for which the history was stored. Either [RU-1] or [RU-2] appears.
[Result]	Shows the result of reagent preparation as [OK] or [NG].
[Temperature]	Temperature when reagent preparation was completed.
[Conductivity]	Conductance when reagent preparation was completed.
[Reference Value]	AD value of the reference voltage when reagent preparation was completed.
[Electrode Value]	AD value of the electrode voltage when reagent preparation was completed.
[Thermistor Value]	AD value of the thermistor voltage when reagent preparation was completed.
[Date]	Date when the history was stored.
[Time]	Time when the history was stored.

● RO water history screen

Displays a history of reagent preparation performed on the RU and related information.
A maximum of 2000 entries are stored and displayed in the RO water history. The RO water history log tab is similar to the error log tab. For the details on the display of the error log tab, see below.
(➤**P.13-76** "13.7 About the RU history screen")

[RU Name]	Name of the RU for which the history was stored. Either [RU-1] or [RU-2] appears.
[Result]	Result of RO water preparation. [OK]: Normal [WA]: Warning value [NG]: Abnormal value
[Temperature]	Temperature when the history was stored.
[Conductivity]	Conductance when the history was stored.
[Reference Value]	AD value of the reference voltage when the history was stored.
[Electrode Value]	AD value of the electrode voltage when the history was stored.
[Thermistor Value]	AD value of the thermistor voltage when the history was stored.

[Type]	Conditions when the history was stored. [Supply Start]: First measurement value when supply to RO water chamber started (the valve was switched). [End Supply]: Last measurement value when supply to RO water chamber ended (the valve was switched). [Fixed Period]: Measurement values every 5 minutes when the time from start to end of supply exceeds 5 minutes. [Range Error]: First measurement value outside the monitor level (two types: abnormal range / warning range) during supply. [Restore]: First measurement value that returned to the monitor level (two types: abnormal range / warning range) during supply.
[Supply Direction]	RO water supply direction when the history was stored. [Chamber]: Measurement value during supply to RO water chamber. [Drain]: Measurement value during draining from RO water chamber. [Supply Direction] is shown as [---] when the [Result] is [NG] or [WA] and the [Type] is [Range Error].
[Date]	Date when the history was stored.
[Time]	Time when the history was stored.

● Error Log screen

A RU history of errors that occurred is displayed with information at the time of occurrence and clearance.
A maximum of 2000 entries are stored and displayed in the error log. For the details on the display of the error log tab, see below.
(➤**P.13-76** "13.7 About the RU history screen")

[RU Name]	Name of the RU for which the history was stored. Either [RU-1] or [RU-2] appears.
[Error]	Displays the description of the error.
[Status]	Displays the status of an error that occurred. [Error]: Error has occurred. [Restore]: Error cleared.
[Date]	Date when the history was stored.
[Time]	Time when the history was stored.

For details on errors, see Chapter 14 or the RU-20 "Instructions For Use".
(➤**P.14-1** "Chapter 14: Troubleshooting", RU-20 Instructions for Use "Chapter 7 Troubleshooting")

● Reagent Replacement Log screen

Displays a history of reagent replacement, and any information that was entered at the time of replacement.
A maximum of 200 entries are stored and displayed in the reagent replacement log. The reagent replacement log tab is similar to the error log tab. For the details on the display of the error log tab, see below.
(➤**P.13-76** "13.7 About the RU history screen")

[RU Name]	Name of the RU for which the history was stored. Either [RU-1] or [RU-2] appears.
[Reagent]	Displays the name of the replaced reagent.
[Lot No.]	Displays the lot number of the replaced reagent.
[Serial No.]	The serial number within the lot of the replaced reagent appears.
[Exp. Date]	Displays the expiration date of the replaced reagent.
[Exp. date after opening]	Displays the shelf life of the replaced reagent after it has been opened.
[Amounts]	The amount of the replaced reagent is displayed.
[Entry Type]	Displays the method of input for the replaced reagent. [Manual]: Manual [Barcode]: Barcode reader
[ProductCode]	Displays the entered part code.
[Manufacturer]	Displays the entered manufacturer.
[Address]	Displays the entered manufacturer's address.
[Date]	Date when the history was stored.
[Time]	Time when the history was stored.

For details on replacing reagents, see the following:
(➤**P.13-37** "13.4.4 Replace with new CELLPACK DST")

● Part Replacement Log screen

This displays the part replacement log.
A maximum of 200 entries are stored and displayed in the part replacement history. The part replacement history tab is similar to the error log tab. For the details on the display of the error log tab, see below.
(➤**P.13-76** "13.7 About the RU history screen")

[RU Name]	Name of the RU for which the history was stored. Either [RU-1] or [RU-2] appears.
[Description]	Information on replaced parts appears. [Filter], [DP1], [DP2], and [Reagent Conductivity Calibration] appear.
[Date]	Date when the history was stored.
[Time]	Time when the history was stored.

For details on part replacement, see the RU "Instructions for Use".
(➤RU-20 Instructions for Use "Chapter 6: 6.4.2 Replacing a maintenance part")

13.7.2 Specifying RU log display conditions (filter)

Conditions can be specified for which RU logs are displayed in the RU log list.
Follow the steps below to specify conditions for the RU logs to be displayed.

1 Click the [Filter] button on the toolbar.

The submenu on the right appears.

2 Click the display conditions.

The submenu closes, and the samples that match the conditions are displayed in the list.

[All]	Click to display all data recorded as logs in the displayed screen.
[RU-1]	Click to display only the data in the logs in the displayed screen that occurred in [RU-1].
[RU-2]	Click to display only the data in the logs in the displayed screen that occurred in [RU-2].

13.7.3 Output RU history to a printer

You can output the RU history list to a connected printer.
Click the [Output] button - [Ledger (LP)] on the toolbar. The RU history list is output from the ledger printer.

13.7.4 Save RU history in CSV format.

You can save the RU history list as a CSV file.
Follow the steps below to save the RU history in CSV format.

1 Click the [File] button - [Output in CSV Format] on the toolbar.

The [Save As] dialog box appears.

2 Specify the folder to save to, or create a new folder.

3 Enter a file name.

The file extension is ".csv".

4 Click [Save].

The CSV data is saved.

Note:

When the dialog box opens, the files names are pre-entered as follows:
- XN_SoftwareVersion_RU_QUALITYLOG.csv (Preparation Log)
- XN_SoftwareVersion_RU_ROWATERLOG.csv (RO water Log)
- XN_SoftwareVersion_RU_ERRORLOG.csv (Error Log)
- XN_SoftwareVersion_RU_REAGENTLOG.csv (Reagent Replacement Log)
- XN_SoftwareVersion_RU_PARTSLOG.csv (Part Replacement Log)

e.g.)

Daily Maintenance Tasks

Yr. Month

Maintenance task \ Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Shutdown																															
Signed																															

Maintenance Tasks to Be Performed as Needed

Maintenance task	M/D Signed	M/D Signed
Auto Rinse		
Cleaning		
Cleaning the instrument		
Replacing waste container		
Draining waste chamber		
Remove Clog		
RBC detector aperture cleaning		
Rinsing waste chamber		
Remove Air Bubbles		
Rinse Flowcell		
Draining reaction chamber		
Drain RBC isolation chamber		
Adjusting the pressure (0.25 MPa)		
Adjusting the pressure (0.16 MPa)		
Adjusting the pressure (0.07 MPa)		
Draining chamber		

Replacing reagents and supply parts

Maintenance task	M/D Signed	M/D Signed
Replacing reagents (CELLPACK DCL)		
Replacing reagents (CELLPACK DST)		
Replacing reagents (CELLPACK DFL)		
Replacing reagents (SULFOLYSER)		
Replacing reagents (Lysercell WNR)		
Replacing reagents (Lysercell WDF)		
Replacing reagents (Lysercell WPC)		
Replacing reagents (Fluorocell WNR)		
Replacing reagents (Fluorocell WDF)		
Replacing reagents (Fluorocell WPC)		
Replacing reagents (Fluorocell RET)		
Replacing reagents (Fluorocell PLT)		
Draining the reagent		
Replacing piercer		
Replace fuses		

* We recommend that our customers prepare a checklist that suits their operating environment.

Chapter 14 Troubleshooting

This chapter explains the errors that may occur in the instrument and how to troubleshoot them.

14.1 Introduction

14.1.1 Error statuses

The following types of error statuses are possible in the transportation units. Take the appropriate troubleshooting actions by referring to the [Action Message(s)] field on the help dialog box of the transportation controller.
For the details on the help dialog box of the transportation controller, see the following.
(➤**P.14-5** "14.1.4 Check current errors for the transportation units")

1 Barcode label read error

If an ID read error occurs while a barcode is being read from a sample or a rack, the transportation unit assigns an error barcode number to that sample or rack. The error barcode number is generated according to the following convention.

- Error barcodes for samples: ERRyyXXXXXXXXXX

yy	Unit number	Unit number of device on which the read error occurred. Corresponds to the unit number in the [Status] screen. (➤**P.6-10** "Chapter 6: 6.2.2 Check system status")
XX-	Sequence number (10 digits)	An error number is assigned in the order of occurrence, from 0000000001 to 9999999999. The number resets to 0000000001 when you turn OFF and ON the transportation unit.

Samples that have been assigned an error barcode are analyzed according to the settings in the transportation controller.

- Error barcodes for racks: EHyyXX

yy	Unit number	Unit number of device on which the read error occurred. Corresponds to the unit number in the [Status] screen. (➤**P.6-10** "Chapter 6: 6.2.2 Check system status")
XX	Sequence number (2 digits)	An error number is assigned in the order of occurrence, from 01 to 99. The number resets to 01 when you turn OFF and ON the transportation unit.

If a read error occurs on the first rack ID that was read, the rack is sent to the analysis line regardless of whether an order exists.
The settings can be configured to stop discharge of the rack from the BT-40 exit line when a sample or rack ID read error occurs. For more information, please contact your local dealer or Sysmex Representative.

2 Analyzer error

Some types of errors that occur in the analyzer during an analysis may also trigger the alarm on the CV-50 or CV-60.
In such a case, press the alarm reset switch on the transportation unit whose alarm is sounding, and then clear the error according to the Instructions for Use. After clearing the error, press the start switch on the CV-50 or CV-60. The samples that encountered an analysis error are automatically re-analyzed.

- **About automatic re-analysis**
  Once the analysis resumes, re-analysis is performed starting with the samples that encountered an error. Only one re-analysis is performed automatically per sample. In off-line analysis (sampler analysis), the analysis does not resume with automatic re-analysis. Instead, it resumes with analysis of unanalyzed samples.

3 Conveyor error

An alarm will sound at the transportation unit where the error occurred. If you are using the TU-40, an alarm will sound on the transportation unit connected before or after the TU-40, depending on the nature of the error. Clear the error and restart analysis. The sample at which the error occurred is automatically re-analyzed. For the procedure for clearing the error, see below.

(➤**P.14-4** "14.1.3 Errors in the transportation unit")

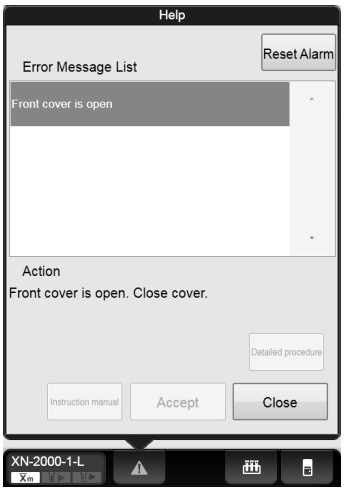
14.1.2 Help dialog box

When a specific error occurs, or a maintenance task or cleaning becomes necessary, the following help dialog box appears on the IPU. Respond to the error message according to the message shown the [Action] field.

(➤**P.14-19** "14.3 Causes of errors and remedial actions")

Errors that occur in transportation units are displayed in the help dialog box of the transportation controller. For information on the help dialog box of the transportation controller, see below.

(➤**P.14-5** "14.1.4 Check current errors for the transportation units")

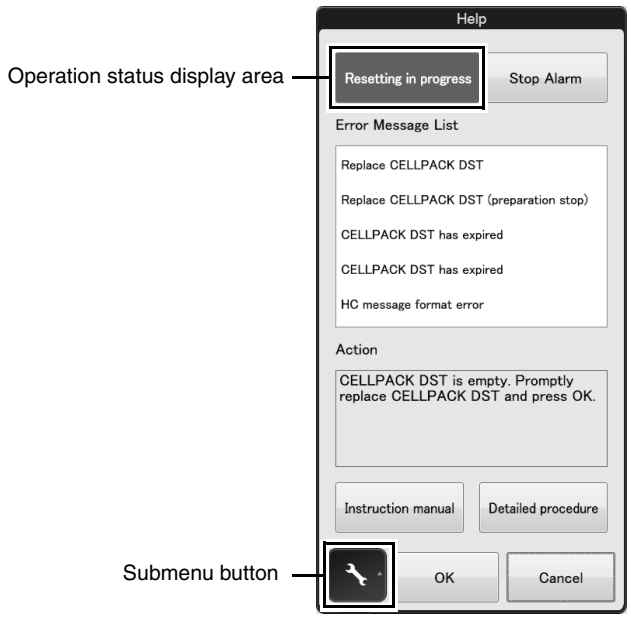


[Reset Alarm]	Click to stop the alarm.
[Error Message List]	Displays a list of current errors. If multiple errors exist, errors that have higher priority are displayed at the top.
[Action]	Displays the troubleshooting action(s) for the selected error. Depending on the type of error, this field may be blank.
[Detailed procedure]	Click to display a section of the "Instructions for Use" manual that explains the procedure for troubleshooting the selected error. This button cannot be selected if there are no relevant sections.
[Instruction manual]	Click to display a section of the "Instructions for Use" manual that explains the selected error. This button cannot be selected if there are no relevant sections.
[Execute]/[Accept]	Depending on the error type, either the [Execute] button or the [Accept] button appears. Clicking the [Execute] button performs the action displayed in the Action field. Clicking the [Accept] button clears the error.
[Close]	Click to close the help dialog box.

Note:

- When there is an error, the help dialog box can be displayed. Click the help button on the control menu.
- All alarms sounding on the IPU will stop when you click any button in the Help dialog box or press any key on the keyboard.

When using the RU-20, if a specific error occurs on the RU-20 or a maintenance task or cleaning task becomes necessary, the help dialog box below appears on the IPU. Respond to the error message according to the message shown the [Action] field.
(➤RU-20 Instructions for Use "Chapter 7: 7.3 Causes of errors and remedial action")



Operation status display area	The status of the RU-20 appears. [Resetting in progress]: The RU-20 unit is resetting. [Maintenance in progress]: The RU-20 unit is executing maintenance operation.
[Stop Alarm]	Click to stop the alarm.
[Error Message List]	Displays a list of current errors. If multiple errors exist, errors that have higher priority are displayed at the top.
[Action]	The corrective action for the highest priority error appears. Depending on the type of error, this field may be blank.
[Show Manual]	Click to display a section of the "Instructions for Use" manual that explains the selected error. This button cannot be selected if there are no relevant sections.
[Show Detailed Procedure]	Click to display a section of the "Instructions for Use" manual that explains the procedure for troubleshooting the selected error. This button cannot be selected if there are no relevant sections.
Submenu button	Click to display a submenu for RU-20 maintenance operations and settings. For details on maintenance, see Chapter 13. (➤**P.13-2** "Chapter 13: 13.1.2 Maintenance menu") For information on the settings, see the "Administrator's Guide". (➤Administrator's Guide, "Chapter 4: Section 4.6 RU-20 Reagent Unit Settings")

[OK]	Click to execute the action or clear the error displayed in the action field.
[Cancel]	Click to close the help dialog box.

Note:

- The RU menu button in the control menu can be clicked to display the help dialog box.
- All alarms sounding on the IPU will stop when you click any button in the Help dialog box or press any key on the keyboard.

14.1.3 Errors in the transportation unit

If an error occurred in a transportation unit, reset the rack in the input area and clear the error. If the error is still not cleared and the rack position LED is not lit, check the error that has occurred in the transportation controller and take the action indicated in the [Action Message(s)]. (➤**P.14-5** "14.1.4 Check current errors for the transportation units")
Follow the steps below to clear the errors.

1 Press the alarm reset switch.

The alarm sound stops.

2 Remove the rack that is in the position indicated by the rack position LED that is lit orange.

If you are using the TU-40, an error may be occurring on the TU-40 that is connected before or after the transportation unit with the illuminated rack position indicator LED.
If there is a foreign object, remove the foreign object.
For the details on the rack position indicator LED, see Chapter 4.
Start yard/Stock yard (ST-40/41/42), Barcode terminal (BT-40)
(Control panel ➤**P.4-7** "Chapter 4: 4.4.2 Start yard/Stock yard")
XN conveyor (CV-50), SP conveyor (CV-60)
(Control panel ➤**P.4-13** "Chapter 4: 4.4.4 XN conveyor (CV-50)")

3 Press the Start/Stop switch (ST-40/41/42, BT-40) or the Start switch (CV-50, CV-60).

Analysis restarts.

4 Place the rack that was removed in the input area.

Fit the slot in the rack onto the protrusion on the right side as viewed from the front.

Note:

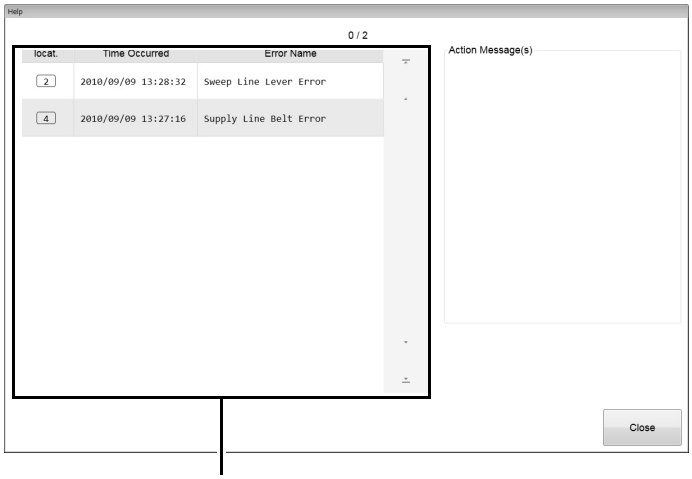
After clearing the error, if you wish to preferentially reanalyze the removed rack using the same device, change to manual analysis or off-line analysis (sampler analysis).

14.1.4 Check current errors for the transportation units

When an error is displayed in the error display area of the transportation controller, you can check the error that is occurring.
Follow the steps below to check the current errors.

1 Touch the Help button on the transportation system area in the transportation controller.

The help dialog box appears.



List of error messages	Displays a list of current errors. If multiple errors exist, errors that have higher priority are displayed at the top.
[locat.]	Displays the name of the transportation unit where the error occurred.
[Time Occurred]	Displays the date and time when the error occurred.
[Error Name]	Displays the description of the error.
[Action Message(s)]	Displays the troubleshooting action(s) for the error selected in the error list. Depending on the type of error, this field may be blank.

2 Check the current error.

3 Touch [Close].

The window closes.

14.2 Error message list

14.2.1 Error message list (in alphabetical order)

The following is an alphabetical list of error messages related to the analyzer/sampler.

14.2.2 Error message list by function

Analyzer/sampler

Errors related to pressure

Errors related to temperature

Errors related to reagents and chambers

Errors related to motors

Errors related to blood aspiration

Errors related to sampler analysis

Errors related to the tube grabber and tube holder

Errors related to sample number and rack number

Errors related to orders

Errors related to analysis

Errors related to covers

Errors related to the laser

Errors related to the system

Errors related to quality control

Errors related to user maintenance and warnings

Errors related to the dye cartridge holder

Start yard/stock yard (ST)

Errors related to the system

Errors related to the transportation units

Errors related to barcode reader

Errors related to communications

Barcode terminal (BT-40)

Errors related to the system

Errors related to the transportation units

Errors related to barcode reader

Errors related to communications

XN conveyor (CV-50)

Errors related to the system

Errors related to the transportation units

Errors related to communications

SP conveyor (CV-60)

Errors related to the system

Errors related to the transportation units

Errors related to barcode reader

Errors related to communications

Transportation controller

Errors related to the system

Errors related to the transportation units

Errors related to communications

Turn unit (TU-40)

Errors related to the system

Errors related to the transportation units

Errors related to communications

14.3 Causes of errors and remedial actions

If an error occurred, refer to the causes and actions below and take appropriate action.
If the error persists after taking the suggested action, or if a malfunction or any other damage occurs, contact your Sysmex service representative.

14.3.1 Analyzer/sampler

Errors related to pressure

Error Messages	-0.04 MPa pressure error
Probable Cause	1) There is a foreign object pressing on the tubing connected to the pneumatic unit, or there is a kink in the tubing. 2) The nipple on the pneumatic unit is loose. 3) Water has accumulated in the anti-backflow chamber.
Actions	1) Remove the object that is pressing on the tubing, and straighten the tubing. 2) Connect the nipple securely. 3) Drain water from the pneumatic trap chamber. For the details on draining water from the pneumatic trap chamber, see Chapter 13. (➤**P.13-30** "Chapter 13: 13.3.16 Drain the pneumatic trap chamber")
Error recovery condition	The pressure returns within the monitored range.

Error Messages	0.07 MPa pressure error 0.16 MPa pressure error 0.25 MPa pressure error
Probable Cause	1) The pressure value has fallen out of the monitored range. 2) The power to the pneumatic unit is OFF. 3) There is a foreign object pressing on the tubing connected to the pneumatic unit, or there is a kink in the tubing. 4) The nipple on the pneumatic unit is loose. 5) There is an abnormality in the regulator.
Actions	1) Click [Execute] in the help dialog box. While checking the displayed [Pressure Adjustment] dialog box, adjust the pressure. For the details on adjusting the pressure, see Chapter 13. (➤**P.13-23** "Chapter 13: 13.3.13 Adjust the pressure (0.25 MPa)") 2) Securely plug in the power cable of the pneumatic unit, and then turn ON the power switch. 3) Remove the object that is pressing on the tubing, and straighten the tubing. 4) Connect the nipple securely. 5) The device needs to be serviced. Contact your Sysmex service representative.
Error recovery condition	The pressure returns within the monitored range.

Error messages	Abnormal pressure loss
Probable Cause	The power to the pneumatic unit shut OFF while running.
Actions	Securely plug in the power cable of the pneumatic unit, and then turn ON the power switch. Remove the sample tubes from the device, and then click [Execute] in the help dialog box. Restart the device.
Error recovery condition	Restart the device.

Errors related to temperature

Error messages	**34°C reagent heater temperature is high** **34°C reagent heater temperature is low** **34°C FCM reaction chamber temperature is high** **34°C FCM reaction chamber temperature is low** **41°C reagent heater temperature is high** **41°C reagent heater temperature is low** **41°C FCM reaction chamber temperature is high** **41°C FCM reaction chamber temperature is low** **FCM detector temperature is high** **FCM detector temperature is low** **FCM sheath temperature is high** **FCM sheath temperature is low**
Probable Cause	The temperature of the unit has fallen out of the monitored range.
Actions	Click [Execute] in the help dialog box. While checking the displayed [Sensor 1] dialog box, wait for the temperature to return within the monitored range. Click [Cancel] to close the dialog box. For details on the [Sensor 1] dialog box, see the following. (➤**P.14-73** "14.5.1 Test proper operation of the device (sensor)") If the error has not cleared after 30 minutes, contact your Sysmex service representative.
Error recovery condition	The temperature returns within the monitored range.

Error messages	**34°C reagent heater thermistor error** **34°C FCM reaction chamber thermistor error** **41°C reagent heater thermistor error** **41°C FCM reaction chamber thermistor error** **APD thermistor error** **FCM detector thermistor error** **FCM sheath thermistor error** **Environment temperature thermistor error**
Probable Cause	The thermistor in the unit has malfunctioned, or there is a break in its connection.
Actions	Remove the sample tubes and racks from the device, and then turn OFF the main power. The device needs to be serviced. Contact your Sysmex service representative.
Error recovery condition	-

Error messages	**Environment temperature is high** **Environment temperature is low**
Probable Cause	The ambient temperature of the device has fallen out of the usable range.
Actions	Click [Execute] in the help dialog box. While checking the displayed [Sensor 1] dialog box, wait for the temperature to return within the monitored range. Click [Cancel] to close the dialog box. For details on the [Sensor 1] dialog box, see below. (➤**P.14-73** "14.5.1 Test proper operation of the device (sensor)")
Error recovery condition	The temperature returns within the monitored range.

Error messages	**Temperature stabilizing error**
Probable Cause	The temperature of the unit is not stabilizing.
Actions	Remove the sample tubes and racks from the device, and then turn OFF the main power. The device needs to be serviced. Contact your Sysmex service representative.
Error recovery condition	-

Errors related to reagents and chambers

Error messages	**CELLPACK DCL aspiration error** **FCM sheath aspiration error** **RBC sheath fluid aspiration error**
Probable Cause	1) The tubing connected to the reagent container is clogged. 2) There is a foreign object pressing on the tubing connected to the reagent container, or there is a kink in the tubing.
Actions	1) Click [Execute] in the help dialog box, and then replenish the reagent. For the details on replenishing a reagent, see Chapter 13. (➤**P.13-43** "Chapter 13: 13.4.6 Replenish reagents") 2) Remove the object that is pressing on the tubing, and straighten the tubing.
Error recovery condition	Replenish the reagent.

Error messages	**Fluorocell WNR aspiration error** **Fluorocell WDF aspiration error** **Fluorocell WPC aspiration error** **Fluorocell RET aspiration error** **Fluorocell PLT aspiration error**
Probable Cause	1) Air bubbles have formed in the tubing connected to the reagent container. 2) The dye cover opened.
Actions	1) Click [Execute] in the help dialog box, and then replenish the reagent. For the details on replenishing a reagent, see Chapter 13. (➤**P.13-43** "Chapter 13: 13.4.6 Replenish reagents") 2) Close the dye cover.
Error recovery condition	1) Replenish the reagent. 2) Close the dye cover.

Error messages	**Out of CELLPACK DCL** **Out of SULFOLYSER** **Out of Lysercell WNR** **Out of Lysercell WDF** **Out of Lysercell WPC** **Out of CELLPACK DFL**
Probable Cause	1) The remainder of the reagent has run out. 2) There is a foreign object pressing on the tubing connected to the reagent container, or there is a kink in the tubing.
Actions	1) Click [Execute] in the help dialog box, and then replace the reagent with a new one. For the details on replacing a reagent, see Chapter 13. (➤**P.13-34** "Chapter 13: 13.4.3 Replace a new dilution/hemolytic agent"). 2) Remove the object that is pressing on the tubing, and straighten the tubing.
Error recovery condition	Replace the reagent.

Error messages	**Out of Fluorocell WNR** **Out of Fluorocell WDF** **Out of Fluorocell WPC** **Out of Fluorocell RET** **Out of Fluorocell PLT**
Probable Cause	The remainder of the reagent has run out.
Actions	Replace the reagent with a new one. For the details on replacing a reagent, see Chapter 13. (➤**P.13-40** "Chapter 13: 13.4.5 Replace a new dye")
Error recovery condition	Replace the reagent.

Error messages	**Reservoir tank is empty (CELLPACK DCL)** **Reservoir tank is empty (SULFOLYSER)** **Reservoir tank is empty (LysercelI WNR)** **Reservoir tank is empty (LysercelI WDF)** **Reservoir tank is empty (LysercelI WPC)** **Reservoir tank is empty (CELLPACK DFL)**
Probable Cause	1) The remainder of the reagent has run out. 2) There is a foreign object pressing on the tubing connected to the reagent container, or there is a kink in the tubing.
Actions	1) Click [Execute] in the help dialog box, and then replace the reagent with a new one. For the details on replacing a reagent, see Chapter 13. (➤**P.13-34** "Chapter 13: 13.4.3 Replace a new dilution/hemolytic agent"). 2) Remove the object that is pressing on the tubing, and straighten the tubing.
Error recovery condition	Replace the reagent.

Error messages	**Out of diluted CELLPACK DST** **RU has stopped supplying reagent.**
Probable Cause	The CELLPACK DST has run out.
Actions	Click [Execute] in the help dialog box of the RU menu, and replace CELLPACK DST. For the procedure for replacing CELLPACK DST, see Chapter 13. (➤**P.13-37** "Chapter 13: 13.4.4 Replace with new CELLPACK DST")
Error recovery condition	Replace the CELLPACK DST.

Error messages	**RBC/HGB chamber not draining**
Probable Cause	The drain tubing of RBC/HGB is clogged.
Actions	Click [Execute] in the help dialog box and drain the reagent from the reaction chamber. For the procedure for draining reagent from the reaction chamber, refer to Chapter 13. (➤**P.13-22** "Chapter 13: 13.3.11 Drain the reagent from the reaction chamber")
Error recovery condition	The draining by the device finishes successfully.

Error messages	**Waste chamber 1 not draining** **Waste chamber 2 not draining**
Probable Cause	The drain tubing is clogged.
Actions	Click [Execute] in the help dialog box and drain waste fluid from the waste chamber. For the procedure for draining waste fluid from the waste chamber, refer to Chapter 13. (➤**P.13-17** "Chapter 13: 13.3.7 Drain the waste chamber")
Error recovery condition	The draining by the device finishes successfully.

Error messages	**Waste container is full**
Probable Cause	The waste container is full.
Actions	Replace the waste container, and then click [Accept] in the help dialog box. For the details on replacing the waste container, see Chapter 13. (➤**P.13-5** "Chapter 13: 13.3.1 Replace the waste container")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Water leak detected** **Water leak detected (analysis not possible)**
Probable Cause	There is a water leak inside the analyzer.
Actions	Turn OFF the main power. The device needs to be serviced. Contact your Sysmex service representative.
Error recovery condition	-

Error messages	**Water leak sns error**
Probable Cause	The water leak sensor has malfunctioned.
Actions	Remove the sample tubes from the device, and then turn OFF the main power. The device needs to be serviced. Contact your Sysmex service representative.
Error recovery condition	-

Errors related to motors

Error messages	FCM sheath motor error RBC sheath motor error
Probable Cause	A piece of tubing or another object is touching the FCM (or RBC) sheath injector piston.
Actions	Separate any tubing that is touching the piston, and click [Execute] on the help dialog box. The motor operation test begins.
Error recovery condition	The test operation by the device finishes successfully.

Error messages	Aspiration unit up-down motor error
Probable Cause	A piece of tubing or another object is touching the aspirator.
Actions	Remove the sample tubes from the device, and then click [Execute] in the help dialog box. Restart the device.
Error recovery condition	Restart the device.

Error messages	Aspiration unit left-right motor error
Probable Cause	A piece of tubing or another object is touching the aspirator.
Actions	Separate any tubing that is touching the piston, and click [Execute] on the help dialog box. The motor operation test begins.
Error recovery condition	The test operation by the device finishes successfully.

Error messages	WB aspiration motor error
Probable Cause	A piece of tubing or another object is touching the WB aspiration pump.
Actions	Separate any tubing that is touching the piston, and click [Execute] on the help dialog box. The motor operation test begins.
Error recovery condition	The test operation by the device finishes successfully.

Errors related to blood aspiration

Error messages	Blood cannot be aspirated.
Probable Cause	1) The density of the sample is inconsistent. 2) The piercer or the tubing of the WB aspiration line is clogged. 3) The blood aspiration sensor has malfunctioned.
Actions	1) Click [Accept] in the help dialog box, mix the sample well, and then re-analyze. 2) Click [Accept] in the help dialog box. Once the device is in READY state, perform an auto rinse. If the error persists, perform cleaning. If the error still persists, replace the piercer. For the details on auto rinse, see Chapter 13. (➤**P.13-7** "Chapter 13: 13.3.2 Perform auto rinse") For the details on cleaning, see Chapter 13. (➤**P.13-9** "Chapter 13: 13.3.3 Perform cleaning") For the details on replacing the piercer, see Chapter 13. (➤**P.13-48** "Chapter 13: 13.5.2 Replace the piercer") 3) The device needs to be serviced. Contact your Sysmex service representative.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Aspiration Sensor error
Probable Cause	The blood aspiration sensor has malfunctioned.
Actions	The device needs to be serviced. Contact your Sysmex service representative.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Insufficient blood volume** **Insufficient blood volume (short sample)**
Probable Cause	1) The sensor could not detect the specified amount of blood. 2) Blood volume is insufficient. 3) The piercer or the tubing of the WB aspiration line is clogged.
Actions	1) Repeat the analysis by manual or micro analysis. 2) Repeat the analysis by manual or micro analysis. 3) Click [Accept] in the help dialog box. Once the device is in READY state, perform an auto rinse. If the error persists, perform cleaning. If the error still persists, replace the piercer. For the details on auto rinse, see Chapter 13. (➤**P.13-7** "Chapter 13: 13.3.2 Perform auto rinse") For the details on cleaning, see Chapter 13. (➤**P.13-9** "Chapter 13: 13.3.3 Perform cleaning") For the details on replacing the piercer, see Chapter 13. (➤**P.13-48** "Chapter 13: 13.5.2 Replace the piercer")
Error recovery condition	Click [Accept] in the help dialog box.

Errors related to sampler analysis

Error messages	**Feed-in table stopper position error**
Probable Cause	There is a foreign object in the movement path of the return prevention stopper in the right sampler pool.
Actions	Remove the foreign object away from the return prevention stopper.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Completed sampler analysis stop**
Probable Cause	When aborting sampler analysis, this message appears after the abort operation has completed.
Actions	-
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Tube presence verification home position error
Probable Cause	1) There is a foreign object in the movement path of the tube rotation mechanism. 2) The sample tube monitoring sensor is not operating correctly due to dust and/or other particles.
Actions	1) Remove the foreign object away from the tube rotation mechanism. 2) Remove the dust and/or other particles.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Sampler belt error
Probable Cause	A rack was detected on the analysis line while initializing the analysis line.
Actions	Remove the rack from the analysis line.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Ejection table is full
Probable Cause	1) The left sampler pool is full with racks. 2) There is a foreign object in the movement path of the racks in the left sampler pool. 3) The left sampler pool rack full sensor is not operating correctly due to dust and/or other particles.
Actions	1) Remove the racks. 2) Remove the foreign object from the left sampler pool. 3) Remove the dust and/or other particles.
Error recovery condition	Perform the above actions. (Automatically cleared)

Error messages	Ejection table stopper position error
Probable Cause	There is a foreign object in the movement path of the return prevention stopper in the left sampler pool.
Actions	Remove the foreign object away from the return prevention stopper.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Rack feed-in home position error** **Rack feed-in error**
Probable Cause	1) There is a foreign object in the movement path of the racks in the right sampler pool. 2) The rack is not placed properly. 3) The rack detecting sensor in the right sampler pool is not operating correctly due to dust and/or other particles.
Actions	1) Remove the foreign object from the right sampler pool. 2) Reposition the rack, and then perform sampler analysis. 3) Remove the dust and/or other particles.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Rack not placed on feed-in table**
Probable Cause	1) The rack is not placed properly. 2) The rack detecting sensor in the right sampler pool is not operating correctly due to dust and/or other particles.
Actions	1) Reposition the rack, and then perform sampler analysis. 2) Remove the dust and/or other particles.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Rack ejection error** **Rack ejection home position error**
Probable Cause	1) There is a foreign object in the movement path of the rack feed-out lever. 2) There is a foreign object in the movement path of the racks in the left sampler pool. 3) The feed-out movement of the rack was blocked. 4) The rack is not moving properly because the table surface of the left sampler pool is dirty.
Actions	1) Remove the foreign object from the rack feed-out lever. 2) Remove the foreign object from the left sampler pool. 3) Reposition the rack, and then perform sampler analysis. 4) Clean the table surface of the left sampler pool.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Rack move mechanism initialization error (front belt)** **Rack move mechanism initialization error (back belt)** **Rack move error (front belt)** **Rack move error (back belt)**
Probable Cause	1) There is a foreign object in the movement path of the rack on the sampler's analysis line. 2) The rack is not placed properly.
Actions	1) Remove the foreign object from the analysis line. 2) Reposition the rack, and then perform sampler analysis.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Sampler analysis stop error has occurred.**
Probable Cause	An interruption error occurred during sampler analysis.
Actions	Clear all errors and then click [Accept] in the help dialog box.
Error recovery condition	Click [Accept] in the help dialog box.

Errors related to the tube grabber and tube holder

Error messages	**Mixing error**
Probable Cause	1) There is a foreign object in the movement path of the tube grabber in the conveyor. 2) The sample tube is not set properly.
Actions	1) Remove the foreign object from the movement path of the tube grabber. 2) Reposition the sample tube, and then perform sampler analysis.
Error recovery condition	The test operation by the device finishes successfully.

Error messages	**Two tubes are in tube holder**
Probable Cause	Both the normal sample tube and the micro collection sample tubes were set for manual analysis.
Actions	Remove the sample tube that does not need to be analyzed.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Tube remains in tube holder
Probable Cause	When the analysis was switched from manual to sampler, a sample tube was found left in the tube holder.
Actions	Remove the sample tube from the tube holder.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Tube pickup error Tube holder move error Tube return error
Probable Cause	1) There is a foreign object in the movement path of the tube holder. 2) The sample tube is not set properly.
Actions	1) Remove the foreign object from the tube holder. 2) Reposition the sample tube, and then perform sampler analysis.
Error recovery condition	The test operation by the device finishes successfully.

Error messages	Hand up-down error Hand open/close error
Probable Cause	1) There is a foreign object in the movement path of the tube grabber in the conveyor. 2) The sample tube is not set properly.
Actions	1) Remove the foreign object from the movement path of the tube grabber. 2) Reposition the sample tube, and then perform sampler analysis.
Error recovery condition	The test operation by the device finishes successfully.

Error messages	The sample must be remixed.
Probable Cause	The set time (60 seconds) elapsed after an analysis information query was sent to the host computer during manual analysis.
Actions	Re-agitate the sample. Click [Accept] in the help dialog box and then repeat analysis.
Error recovery condition	Click [Accept] in the help dialog box.

Errors related to sample number and rack number

Error messages	Failed to read sample number (analyzer). Failed to read sample number.
Probable Cause	1) The barcode label on the sample is dirty. 2) The print quality of the barcode label on the sample is poor. 3) The position of the barcode label on the sample is off.
Actions	Check the position and cleanliness of the barcode label.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Positive ID check error
Probable Cause	1) The barcode read by the sampler was different from that read by the analyzer. 2) There is a foreign object in the device.
Actions	1) Reposition the sample, and then perform sampler analysis. 2) Remove the foreign object from the device.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Sample number not input
Probable Cause	No sample number was specified at the time of manual analysis.
Actions	Enter the sample number, and then perform the analysis.
Error recovery condition	Click [Accept] in the help dialog box.

Errors related to orders

Error messages	Analysis item not specified
Probable Cause	No analysis parameter was specified at the time of manual analysis.
Actions	Enter the analysis parameter, and then perform the analysis.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Invalid analysis item is specified
Probable Cause	An analysis parameter was specified that cannot be analyzed in manual analysis.
Actions	Change the analysis parameter, and then perform the analysis.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Invalid analysis item is specified (sampler analysis)**
Probable Cause	An analysis parameter was specified that cannot be analyzed in sampler analysis.
Actions	Check the analysis parameter and click [Accept] in the help dialog box. The analysis of the sample is skipped, and the sampler analysis continues.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**No analyzer is ready.**
Probable Cause	The sample could not be analyzed due to the status of the analyzer.
Actions	1) Change the analyzer to sampler analysis. 2) Cancel sampler analysis from the menu.
Error recovery condition	Change the analyzer's settings to match the sample.

Errors related to analysis

Error messages	**PLT sampling error** **RBC sampling error**
Probable Cause	1) The density of the sample is inconsistent. 2) The detector suddenly became clogged.
Actions	1) Click [Accept] in the help dialog box, mix the sample well, and then re-analyze. 2) Click [Accept] in the help dialog box. Once the device is in READY state, remove the clog from the RBC detector. For the details on removing a clog from the RBC detector, see Chapter 13. (➤**P.13-12** "Chapter 13: 13.3.5 Clog removal from the RBC detector")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**PLT-F sampling error** **RET sampling error** **WDF sampling error** **WNR sampling error** **WPC sampling error**
Probable Cause	1) The density of the sample is inconsistent. 2) The flowcell has suddenly become clogged.
Actions	1) Click [Accept] in the help dialog box, mix the sample well, and then re-analyze. 2) Click [Accept] in the help dialog box. Once the device is in READY state, rinse the flowcell. For the details on rinsing the flowcell, see Chapter 13. (➤**P.13-20** "Chapter 13: 13.3.10 Rinse flowcell")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**WDF channel error** **PLT-F channel error** **WNR channel error** **WPC channel error** **PLT channel error** **RBC channel error**
Probable Cause	1) The density of the sample is inconsistent. 2) Because of external noise, the number of particles has exceeded the limit of display range.
Actions	1) Click [Accept] in the help dialog box, mix the sample well, and then re-analyze. 2) Keep the noise source away from the Main Unit. Click [Accept] in the help dialog box, and then re-analyze.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**RET channel error**
Probable Cause	1) The density of the sample is inconsistent. 2) The flowcell is clogged. 3) The flowcell is dirty. 4) Air bubbles have formed in the flowcell.
Actions	1) Click [Accept] in the help dialog box, mix the sample well, and then re-analyze. 2) Click [Accept] in the help dialog box. Once the device is in READY state, rinse the flowcell. For the details on rinsing the flowcell, see Chapter 13. (➤**P.13-20** "Chapter 13: 13.3.10 Rinse flowcell") 3) Click [Accept] in the help dialog box. Once the device is in READY state, rinse the flowcell. For the details on rinsing the flowcell, see Chapter 13. (➤**P.13-20** "Chapter 13: 13.3.10 Rinse flowcell") 4) Click [Accept] in the help dialog box. Once the device is in READY state, remove the air bubbles from the flowcell. For the details on removing air bubbles from the flowcell, see Chapter 13. (➤**P.13-19** "Chapter 13: 13.3.9 Remove air bubbles from flowcell")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	HGB error
Probable Cause	The HGB background value or the HGB sample value has fallen out of the specified range.
Actions	Click [Accept] in the help dialog box, and then re-analyze.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	RBC detector clog Bubbles in RBC detector
Probable Cause	1) The detector is clogged. 2) Air bubbles have formed in the detector.
Actions	Click [Execute] in the help dialog box, and then remove the clog from the RBC detector. For the details on removing a clog from the RBC detector, see Chapter 13. (➤**P.13-12** "Chapter 13: 13.3.5 Clog removal from the RBC detector")
Error recovery condition	The clog is successfully removed from the RBC detector.

Error messages	Low count error
Probable Cause	The piercer or the tubing of the WB aspiration line is clogged.
Actions	Click [Accept] in the help dialog box. Once the device is in READY state, perform an auto rinse. If the error persists, perform cleaning. If the error still persists, replace the piercer. For the details on auto rinse, see Chapter 13. (➤**P.13-7** "Chapter 13: 13.3.2 Perform auto rinse") For the details on cleaning, see Chapter 13. (➤**P.13-9** "Chapter 13: 13.3.3 Perform cleaning") For the details on replacing the piercer, see Chapter 13. (➤**P.13-48** "Chapter 13: 13.5.2 Replace the piercer")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Data Errors
Probable Cause	The analyzed value has fallen out of the specified range of upper/lower limits.
Actions	Check the analyzed data, and revise the specified upper and lower limits.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Analysis result is high
Probable Cause	When body fluid analysis was performed, analysis data with high values that may affect the next analysis results were obtained*. * The availability of this function depends on your system configuration.
Actions	Remove the sample tube from the device. Click [Execute] in the help dialog box to perform a background check. For the details on background check of body fluid mode, see Chapter 9. (➤**P.9-11** "Chapter 9: 9.4 Body fluid analysis")
Error recovery condition	The background check completes successfully.

Error messages	Background check error
Probable Cause	1) Air bubbles have formed in the detector. 2) The detector is clogged. 3) The detector is dirty. 4) The reagent is defective.
Actions	1) Click [Execute] in the help dialog box, and then perform an auto rinse. For the details on auto rinse, see Chapter 13. (➤**P.13-7** "Chapter 13: 13.3.2 Perform auto rinse") 2) Click [Execute] in the help dialog box, and then perform an auto rinse. For the details on auto rinse, see Chapter 13. (➤**P.13-7** "Chapter 13: 13.3.2 Perform auto rinse") 3) Click [Execute] in the help dialog box, and then perform an auto rinse. For the details on auto rinse, see Chapter 13. (➤**P.13-7** "Chapter 13: 13.3.2 Perform auto rinse") 4) Replace the reagent with a new one. For the details on replacing a reagent, see Chapter 13. (➤**P.13-32** "Chapter 13: 13.4 Replace reagents")
Error recovery condition	The value of the background check is within the acceptable range.

Errors related to covers

Error messages	Front cover open error
Probable Cause	The top bottom cover opened during analysis.
Actions	Remove the sample tubes from the device, and then close the bottom front cover. Click [Execute] in the help dialog box. Restart the device.
Error recovery condition	Restart the device.

Error messages	Front cover is open
Probable Cause	1) The bottom front cover opened. 2) The sensor on the bottom front cover is malfunctioned.
Actions	1) Close bottom front cover. 2) The device needs to be serviced. Contact your Sysmex service representative.
Error recovery condition	1) Close the bottom front cover. 2) -

Error messages	FCM detector cover is open.
Probable Cause	1) The FCM cover is open. 2) The sensor on the FCM cover is malfunctioned.
Actions	Contact your Sysmex service representative.
Error recovery condition	-

Error messages	RBC detector cover is open.
Probable Cause	1) The RBC cover is open. 2) The sensor on the RBC cover is malfunctioned.
Actions	1) Close the RBC cover. 2) The device needs to be serviced. Contact your Sysmex service representative.
Error recovery condition	1) Close the RBC cover. 2) -

Error messages	**Fluorocell WNR cover is open** **Fluorocell WDF cover is open** **Fluorocell WPC cover is open** **Fluorocell RET cover is open** **Fluorocell PLT cover is open**
Probable Cause	1) The dye cover opened during analysis. 2) The sensor on the dye cover is malfunctioned.
Actions	1) Close the dye cover. 2) The device needs to be serviced. Contact your Sysmex service representative.
Error recovery condition	1) Close the dye cover. 2) -

Errors related to the laser

Error messages	**Laser output error**
Probable Cause	The laser output has exceeded the control range.
Actions	Remove the sample tubes and racks from the device, and then turn OFF and ON the main power to the system. The laser needs to be replaced. Contact your Sysmex service representative.
Error recovery condition	-

Error messages	**Laser life**
Probable Cause	It is time to replace the laser.
Actions	The laser needs to be replaced. Contact your Sysmex service representative.
Error recovery condition	-

Errors related to the system

Error messages	Analyzer barcode reader communication error
Probable Cause	There was a communication error between the analyzer and the barcode reader.
Actions	Remove the sample tubes and racks from the device, and then turn OFF and ON the main power to the system. If the error persists, contact your Sysmex service representative.
Error recovery condition	-

Error messages	Conveyor communication error
Probable Cause	Communication with the conveyor has been disconnected.
Actions	Check the connection with the conveyor.
Error recovery condition	-

Error messages	Communication error during sampler analysis.
Probable Cause	Communication with the analyzer has been disconnected in sampler analysis.
Actions	Remove the sample tubes and racks from the device, check the connection with the analyzer.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	RFID communication error
Probable Cause	Communication with the RFID unit has been disconnected.
Actions	Remove the sample tubes and racks from the device, and then turn OFF and ON the main power to the system. If the error persists, contact your Sysmex service representative.
Error recovery condition	-

Error messages	Instrument communication error
Probable Cause	There was a communication error between the device and the IPU.
Actions	Remove the sample tubes and racks from the device, and then turn OFF and ON the main power to the system.
Error recovery condition	Power OFF

Error messages	Internal Error
Probable Cause	An error occurred in the operation of the program.
Actions	Turn OFF the main power. Contact your Sysmex service representative.
Error recovery condition	-

Errors related to quality control

Error messages	L-J Control Error X-barM control error X-bar control error
Probable Cause	An abnormality was detected in the quality control data.
Actions	In the QC chart, check the parameter that exceeded the QC limits, and then click [Accept]. Perform calibration as necessary. For details on QC charts, see Chapter 8. (➤**P.8-18** "Chapter 8: 8.5.2 QC Chart screen")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Control has expired.
Probable Cause	The control blood has expired.
Actions	Replace the control blood by a new lot. Register the lot information, and then click [Accept] in the help dialog box. For the details on registering lot information, see Chapter 8. (➤**P.8-4** "Chapter 8: 8.3 Registering and modifying a QC file (lot information input)")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Control is not entered.
Probable Cause	Control blood with an unregistered lot number was used.
Actions	Register the lot information of the control blood, and then click [Accept] in the help dialog box. For the details on registering lot information, see Chapter 8. (➤**P.8-4** "Chapter 8: 8.3 Registering and modifying a QC file (lot information input)")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	QC not executed.
Probable Cause	It is time to perform QC analysis.
Actions	Perform QC analysis, and then click [Accept] in the help dialog box. For the details on quality control, see Chapter 8. (➤**P.8-11** "Chapter 8: 8.4 Perform QC analysis")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**WNR Scattergram sensitivity error** **WDF Scattergram sensitivity error** **WPC Scattergram sensitivity error** **RET Scattergram sensitivity error** **PLT-F Scattergram sensitivity error**
Probable Cause	A numerical value for a parameter in the scattergram is outside the specified range.
Actions	Check the scattergram.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Check Measurement Mode
Probable Cause	The analysis mode and the type of control blood are not compatible.
Actions	Check the type of analysis mode and control blood.
Error recovery condition	Click [Accept] in the help dialog box.

Errors related to user maintenance and warnings

Error messages	Cleaning is required.
Probable Cause	It is time to perform cleaning.
Actions	Perform cleaning, and then click [Accept] in the help dialog box. For the details on cleaning, see Chapter 13. (➤**P.13-9** "Chapter 13: 13.3.3 Perform cleaning")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	Cleaning is required (warning)
Probable Cause	Cleaning needs to be performed.
Actions	Click [Execute] in the help dialog box, and then perform cleaning. For the details on cleaning, see Chapter 13. (➤**P.13-9** "Chapter 13: 13.3.3 Perform cleaning")
Error recovery condition	Cleaning completes successfully.

Error messages	**CELLPACK DCL has expired** **SULFOLYSER has expired** **Lysercell WNR has expired** **Lysercell WDF has expired** **Lysercell WPC has expired** **CELLPACK DFL has expired**
Probable Cause	The reagent has expired.
Actions	Click [Execute] in the help dialog box, and then replace the reagent with a new one. For the details on replacing a reagent, see Chapter 13. (➤**P.13-34** "Chapter 13: 13.4.3 Replace a new dilution/hemolytic agent").
Error recovery condition	Replace the reagent.

Error messages	**Fluorocell WNR has expired** **Fluorocell WDF has expired** **Fluorocell WPC has expired** **Fluorocell RET has expired** **Fluorocell PLT has expired**
Probable Cause	The reagent has expired.
Actions	Replace the reagent with a new one. For the details on replacing a reagent, see Chapter 13. (➤**P.13-40** "Chapter 13: 13.4.5 Replace a new dye")
Error recovery condition	Replace the reagent.

Error messages	**CELLPACK DST has expired**
Probable Cause	The CELLPACK DST has expired.
Actions	Replace the CELLPACK DST with a new one. For the details on replacing a CELLPACK DST, see Chapter 13. (➤**P.13-37** "Chapter 13: 13.4.4 Replace with new CELLPACK DST")
Error recovery condition	Replace the CELLPACK DST.

Error messages	**Piercer replacement is required.**
Probable Cause	It is time to replace the piercer.
Actions	Turn OFF the main power to the analyzer, and then replace the piercer. For the details on replacing the piercer, see Chapter 13. (➤**P.13-48** "Chapter 13: 13.5.2 Replace the piercer")
Error recovery condition	Replace the piercer.

Error messages	**Press Start SW**
Probable Cause	The set time (5 hours) has elapsed since the analyzer entered the standby state.
Actions	Press the start switch.
Error recovery condition	Press the start switch.

Error messages	**CELLCLEAN AUTO is not placed correctly**
Probable Cause	1) The CELLCLEAN AUTO is not placed correctly. 2) CELLCLEAN AUTO is not placed in the shutdown rack or rinse rack. 3) Two or more CELLCLEAN AUTO containers are placed in the shutdown rack or rinse rack.
Actions	1) Place the CELLCLEAN AUTO in the specified position again. 2) Place the CELLCLEAN AUTO in the specified rack again. For shutdown racks, see Chapter 6. (➤**P.6-23** "Chapter 6: 6.7 Shutdown") For rinse racks, see Chapter 13. (➤**P.13-11** "Chapter 13: 13.3.4 Rinsing all instruments") 3) Remove CELLCLEAN AUTO vials that are not in the specified positions from the rack and place the rack again. For the shutdown procedure, see Chapter 6. (➤**P.6-23** "Chapter 6: 6.7 Shutdown") For rinsing procedures, see Chapter 13. (➤**P.13-11** "Chapter 13: 13.3.4 Rinsing all instruments")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**A sample other than CELLCLEAN AUTO has been placed.**
Probable Cause	A sample other than CELLCLEAN AUTO is placed in a rack in which CELLCLEAN AUTO is placed in the specified position.
Actions	Remove sample tubes that are not CELLCLEAN AUTO from the rack and place the rack again. (➤**P.6-23** "Chapter 6: 6.7 Shutdown")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Unable to correctly detect CELLCLEAN AUTO.**
Probable Cause	The CELLCLEAN AUTO information read by the sampler does not match the CELLCLEAN AUTO information read by the analyzer.
Actions	Place the CELLCLEAN AUTO again. (➤**P.6-23** "Chapter 6: 6.7 Shutdown")
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**CELLCLEAN AUTO has already been used.**
Probable Cause	A used CELLCLEAN AUTO has been installed.
Actions	Replace the CELLCLEAN AUTO with a new one.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Cannot recognize CELLCLEAN AUTO**
Probable Cause	1) The barcode label on the CELLCLEAN AUTO is dirty. 2) The position of the barcode label on the CELLCLEAN AUTO is off.
Actions	Check the position and cleanliness of the barcode label.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**CELLCLEAN AUTO has expired.**
Probable Cause	The CELLCLEAN AUTO has expired.
Actions	Replace the CELLCLEAN AUTO with a new one.
Error recovery condition	Click [Accept] in the help dialog box.

Errors related to the dye cartridge holder

Error messages	**Wrong reagent installed in Fluorocell WNR holder** **Wrong reagent installed in Fluorocell WDF holder** **Wrong reagent installed in Fluorocell WPC holder** **Wrong reagent installed in Fluorocell RET holder** **Wrong reagent installed in Fluorocell PLT holder**
Probable Cause	The dye cartridge holder and the dye that was installed are different.
Actions	Set a correct reagent. For the details on setting a reagent, see Chapter 13. (➤**P.13-40** "Chapter 13: 13.4.5 Replace a new dye")
Error recovery condition	Set a correct reagent.

Error messages	**Fluorocell WNR is not installed** **Fluorocell WDF is not installed** **Fluorocell WPC is not installed** **Fluorocell RET is not installed** **Fluorocell PLT is not installed**
Probable Cause	The dye has not been installed in the dye cartridge holders.
Actions	Set a reagent. For the details on setting a reagent, see Chapter 13. (➤**P.13-40** "Chapter 13: 13.4.5 Replace a new dye")
Error recovery condition	Set a reagent.

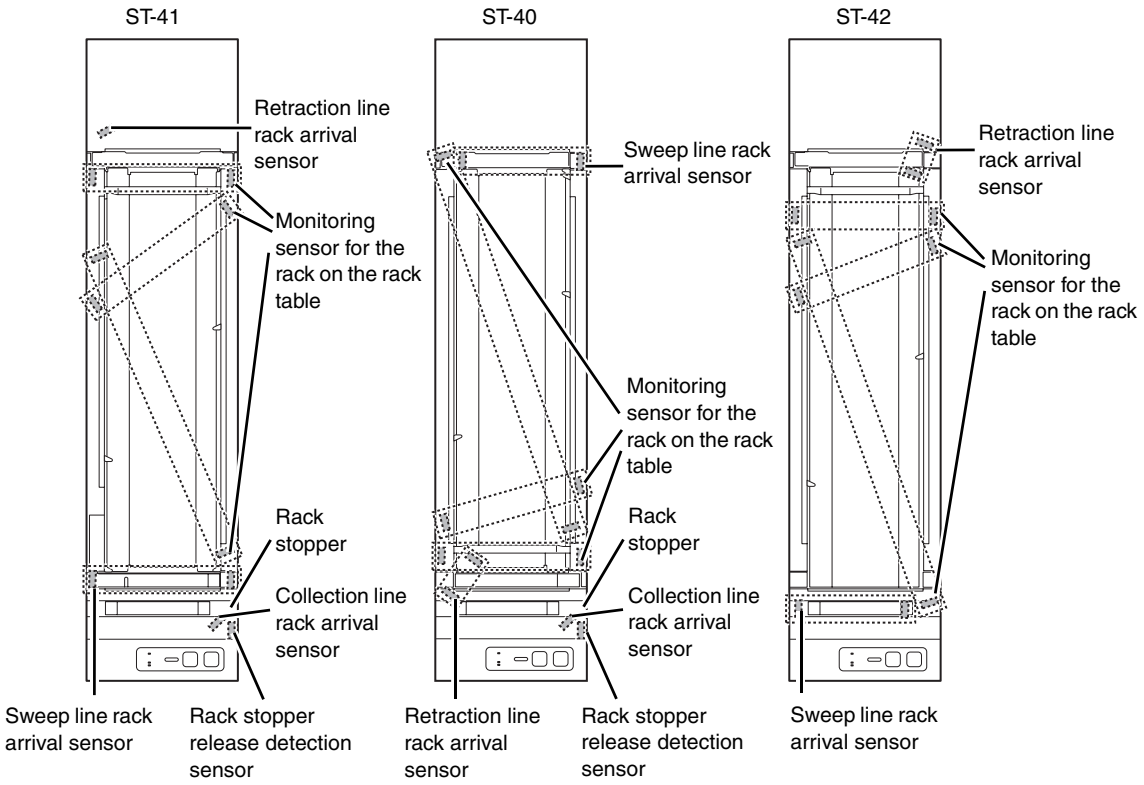
Error messages	**Fluorocell WNR has already been used** **Fluorocell WDF has already been used** **Fluorocell WPC has already been used** **Fluorocell RET has already been used** **Fluorocell PLT has already been used**
Probable Cause	A used dye has been installed.
Actions	Replace the reagent with a new one. For the details on replacing a reagent, see Chapter 13. (➤**P.13-40** "Chapter 13: 13.4.5 Replace a new dye")
Error recovery condition	Set a new reagent.

Error messages	**Cannot recognize Fluorocell WNR information** **Cannot recognize Fluorocell WDF information** **Cannot recognize Fluorocell WPC information** **Cannot recognize Fluorocell RET information** **Cannot recognize Fluorocell PLT information**
Probable Cause	The ID of the dye is damaged.
Actions	Click [Execute] in the help dialog box, click the reagent name, and register the reagent information.
Error recovery condition	Register reagent information.

Error messages	**Fluorocell WNR RFID tag error** **Fluorocell WDF RFID tag error** **Fluorocell WPC RFID tag error** **Fluorocell RET RFID tag error** **Fluorocell PLT RFID tag error**
Probable Cause	Cannot write any data to the dye ID.
Actions	Replace the reagent that has the correct ID. For the details on replacing a reagent, see Chapter 13. (➤**P.13-40** "Chapter 13: 13.4.5 Replace a new dye")
Error recovery condition	Set the reagent that has the correct ID.

14.3.2 Start yard/stock yard (ST)

The names and positions of the sensors attached to the ST are shown below.



The structure of ST

Errors related to the system

Error messages	System Error
Probable Cause	There was an error in the system.
Actions	Turn OFF and ON the main power to the system. If the error persists, contact your Sysmex service representative.
Error recovery condition	-

Errors related to the transportation units

Error messages	Retraction Line Belt Error
Probable Cause	1) There is an invalid rack on the retraction line, at the beginning or the end of the rack transport operation. 2) There is a foreign object in the movement path of the racks on the retraction line.
Actions	1) Remove the rack from the retraction line. 2) Remove the foreign object from the retraction line.
Error recovery condition	Press the start/stop switch.

Error messages	Sweep Line Lever Error
Probable Cause	1) There is an invalid rack on the sweep line, at the beginning or the end of the rack transport operation. 2) There is a foreign object in the movement path of the rack feed-out lever on the sweep line.
Actions	1) Remove the rack from the sweep line. 2) Remove the foreign object from the sweep line and rack table.
Error recovery condition	Press the start/stop switch.

Error messages	Feed Arm Error Feed Hook Error
Probable Cause	There is a foreign object in the movement path of the rack feed-out lever on the retraction line.
Actions	Remove the foreign object from the retraction line and rack table.
Error recovery condition	Press the start/stop switch.

Error messages	Return Line Belt Error
Probable Cause	1) There is an invalid rack on the collection line, at the beginning or the end of the rack transport operation. 2) There is a foreign object in the movement path of the racks on the collection line.
Actions	1) Remove the rack from the collection line. 2) Remove the foreign object from the collection line.
Error recovery condition	Press the start/stop switch.

Error messages	Rack Stopper Error
Probable Cause	There is a foreign object in the movement path of the rack stopper on the collection line.
Actions	Remove the foreign object from the collection line.
Error recovery condition	Press the start/stop switch.

Error messages	Remaining Rack Detection Error
Probable Cause	An invalid rack was detected in the transportation unit during initialization.
Actions	Remove the rack from the position indicated by the rack position indicator LED.
Error recovery condition	Press the start/stop switch.

Errors related to barcode reader

Error messages	Rack Barcode Error
Probable Cause	1) The barcode label on the rack is dirty. 2) The print quality of the barcode label on the rack is poor. 3) The position of the barcode label on the rack is off.
Actions	Check the position and cleanliness of the barcode label. If there is no problem with the label, the device must be repaired. Contact your Sysmex service representative.
Error recovery condition	Press the start/stop switch.

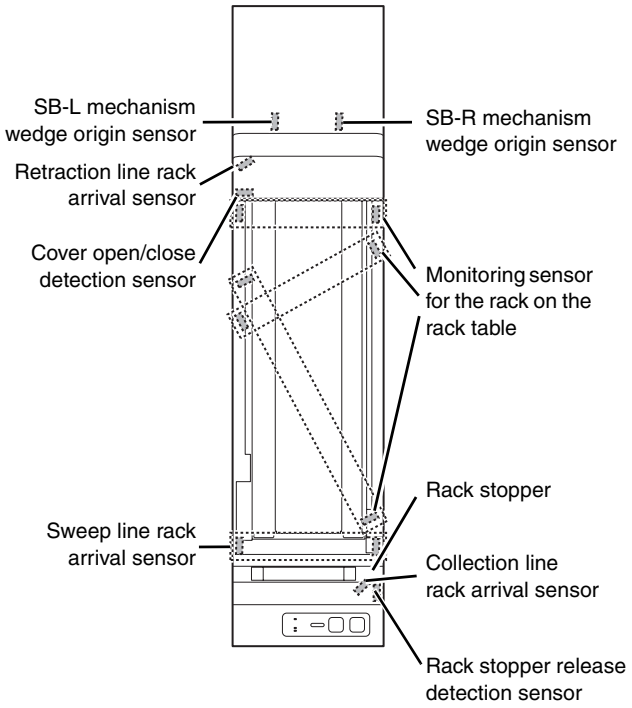
Errors related to communications

Error messages	**No error message. Check in the following cases:** **• The ST-40/41/42 display remains gray and does not change in the [Status] screen after startup.** **• A rack is not sent from previously connected transportation units.**
Probable Cause	A communication error occurred during startup and the ST-40/41/42 does not connect with the transportation controller.
Actions	Turn OFF the main power switch of the ST-40/41/42.
Error recovery condition	After turning off the main power of the ST-40/41/42, turn the power back on and press the startup switch*. * At this time, an error may occur in another device. Stop the alarm, wait until the device that is starting up has completed startup, and reset.

Error messages	**CT-90 Communication Error**
Probable Cause	1) The power to the transportation controller is OFF. 2) The connection with the transportation controller is broken.
Actions	1) Check if the transportation controller is started. 2) Check the connection between the transportation controller and the unit.
Error recovery condition	-

14.3.3 Barcode terminal (BT-40)

The names and positions of the sensors attached to the BT-40 are shown below.



The structure of BT-40

Errors related to the system

Error messages	System Error
Probable Cause	There was an error in the system.
Actions	Turn OFF and ON the main power to the system. If the error persists, contact your Sysmex service representative.
Error recovery condition	-

Errors related to the transportation units

Error messages	**Sample Barcode Mechanism Right Error** **Sample Barcode Mechanism Left Error**
Probable Cause	There is a foreign object in the movement path of the sample barcode mechanism.
Actions	Remove the foreign object away from the sample barcode mechanism.
Error recovery condition	Press the start/stop switch.

Error messages	**Retraction Line Belt Error**
Probable Cause	1) There is an invalid rack on the retraction line, at the beginning or the end of the rack transport operation. 2) There is a foreign object in the movement path of the racks on the retraction line.
Actions	1) Remove the rack from the retraction line. 2) Remove the foreign object from the retraction line.
Error recovery condition	Press the start/stop switch.

Error messages	**Sweep Line Lever Error**
Probable Cause	1) There is an invalid rack on the sweep line, at the beginning or the end of the rack transport operation. 2) There is a foreign object in the movement path of the rack feed-out lever on the sweep line.
Actions	1) Remove the rack from the sweep line. 2) Remove the foreign object from the sweep line and rack table.
Error recovery condition	Press the start/stop switch.

Error messages	**Feed Arm Error** **Feed Hook Error**
Probable Cause	There is a foreign object in the movement path of the rack feed-out lever on the retraction line.
Actions	Remove the foreign object from the retraction line and rack table.
Error recovery condition	Press the start/stop switch.

Error messages	Return Line Belt Error
Probable Cause	1) There is an invalid rack on the collection line, at the beginning or the end of the rack transport operation. 2) There is a foreign object in the movement path of the racks on the collection line.
Actions	1) Remove the rack from the collection line. 2) Remove the foreign object from the collection line.
Error recovery condition	Press the start/stop switch.

Error messages	Rack Stopper Error
Probable Cause	There is a foreign object in the movement path of the rack stopper on the collection line.
Actions	Remove the foreign object from the collection line.
Error recovery condition	Press the start/stop switch.

Error messages	Remaining Rack Detection Error
Probable Cause	An invalid rack was detected in the transportation unit during initialization.
Actions	Remove the rack from the position indicated by the rack position indicator LED.
Error recovery condition	Press the start/stop switch.

Errors related to barcode reader

Error messages	Sample Barcode Error
Probable Cause	1) The barcode label on the sample is dirty. 2) The print quality of the barcode label on the sample is poor. 3) The position of the barcode label on the sample is off.
Actions	Check the position and cleanliness of the barcode label. If there is no problem with the label, the device must be repaired. Contact your Sysmex service representative.
Error recovery condition	Press the start/stop switch.

Error messages	Rack Barcode Error
Probable Cause	1) The barcode label on the rack is dirty. 2) The print quality of the barcode label on the rack is poor. 3) The position of the barcode label on the rack is off.
Actions	Check the position and cleanliness of the barcode label. If there is no problem with the label, the device must be repaired. Contact your Sysmex service representative.
Error recovery condition	Press the start/stop switch.

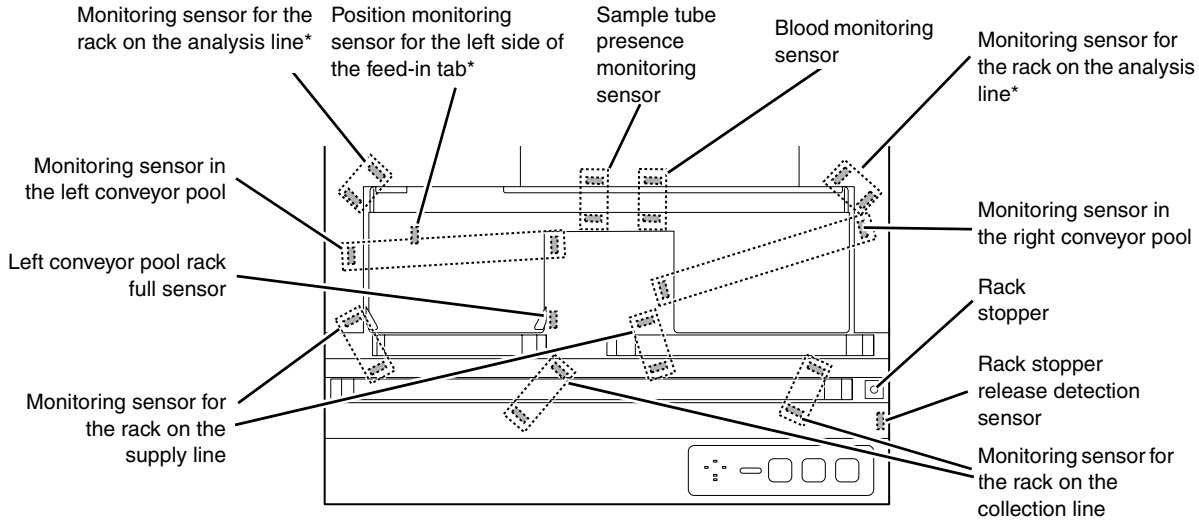
Errors related to communications

Error messages	No error message. Check in the following cases: • The BT-40 display remains gray and does not change in the [Status] screen after startup. • A rack is not sent from previously connected transportation units.
Probable Cause	A communication error occurred during startup and the BT-40 does not connect with the transportation controller.
Actions	Turn OFF the main power switch of the BT-40.
Error recovery condition	After turning off the main power of the BT-40, turn the power back on and press the startup switch*. * At this time, an error may occur in another device. Stop the alarm, wait until the device that is starting up has completed startup, and reset.

Error messages	CT-90 Communication Error
Probable Cause	1) The power to the transportation controller is OFF. 2) The connection with the transportation controller is broken.
Actions	1) Check if the transportation controller is started. 2) Check the connection between the transportation controller and the unit.
Error recovery condition	-

14.3.4 XN conveyor (CV-50)

The names and positions of the sensors attached to the CV-50 are shown below.



The structure of a CV-50

*Sensor or mechanism monitored by the analyzer.

Errors related to the system

Error messages	System Error
Probable Cause	There was an error in the system.
Actions	Turn OFF and ON the main power to the system. If the error persists, contact your Sysmex service representative.
Error recovery condition	-

Errors related to the transportation units

Error messages	Supply Line Belt Error
Probable Cause	1) There is an invalid rack on the supply line, at the beginning or the end of the rack transport operation. 2) There is a foreign object in the movement path of the racks on the supply line.
Actions	1) Remove the rack from the supply line. If you are using the extension conveyor, remove the rack from the adjoining extension conveyor. 2) Remove the foreign object from the supply line.
Error recovery condition	Press the start switch.

Error messages	Return Line Belt Error
Probable Cause	1) There is an invalid rack on the collection line, at the beginning or the end of the rack transport operation. 2) There is a foreign object in the movement path of the racks on the collection line.
Actions	1) Remove the rack from the collection line. If you are using the extension conveyor, remove the rack from the adjoining extension conveyor. 2) Remove the foreign object from the collection line.
Error recovery condition	Press the start switch.

Error messages	Feed Arm Right Error Feed Arm Left Error
Probable Cause	1) There is a foreign object in the movement path of the rack feed-out lever on the supply line. 2) There is a foreign object in the movement path of the rack feed-in lever on the analysis line.
Actions	1) Remove the foreign object from the supply line and right conveyor pool. 2) Remove the foreign object from the analysis line and left conveyor pool.
Error recovery condition	Press the start switch.

Error messages	Elevator Table Error
Probable Cause	There is a foreign object in the movement path of the elevator table.
Actions	Remove the foreign object from the elevator table.
Error recovery condition	Press the start switch.

Error messages	Rack Stopper Error
Probable Cause	There is a foreign object in the movement path of the rack stopper on the collection line.
Actions	Remove the foreign object from the collection line.
Error recovery condition	Press the start switch.

Error messages	Remaining Rack Detection Error
Probable Cause	An invalid rack was detected in the transportation unit during initialization.
Actions	Remove the rack from the position indicated by the rack position indicator LED.
Error recovery condition	Press the start switch.

Errors related to communications

Error messages	**No error message. Check in the following cases:** • **The CV-50 display remains gray and does not change in the [Status] screen after startup.** • **A rack is not sent from previously connected transportation units.**
Probable Cause	A communication error occurred during startup and the CV-50 does not connect with the transportation controller.
Actions	Turn OFF the main power switch of the CV-50.
Error recovery condition	After turning off the main power of the CV-50, turn the power back on and press the startup switch*. * At this time, an error may occur in another device. Stop the alarm, wait until the device that is starting up has completed startup, and reset.

Error messages	**CT-90 Communication Error**
Probable Cause	1) The power to the transportation controller is OFF. 2) The connection with the transportation controller is broken.
Actions	1) Check if the transportation controller is started. 2) Check the connection between the transportation controller and the unit.
Error recovery condition	-

Error messages	**Analyzer Communication Error**
Probable Cause	1) The power to the analyzer is OFF. 2) The connection with the analyzer is broken.
Actions	1) Check if the analyzer is started. 2) Check the connection between the analyzer and the unit.
Error recovery condition	-

If an error occurs in a part monitored by the analyzer, a help dialog box will appear in the screen of the IPU. The following errors may occur:

Error messages	**Rack feed-in home position error** **Rack feed-in error**
Probable Cause	1) There is a foreign object in the movement path of the racks in the right conveyor pool. 2) The rack is not placed properly.
Actions	1) Remove the foreign object from the right conveyor pool. 2) Remove the racks.
Error recovery condition	Click [Accept] in the help dialog box.

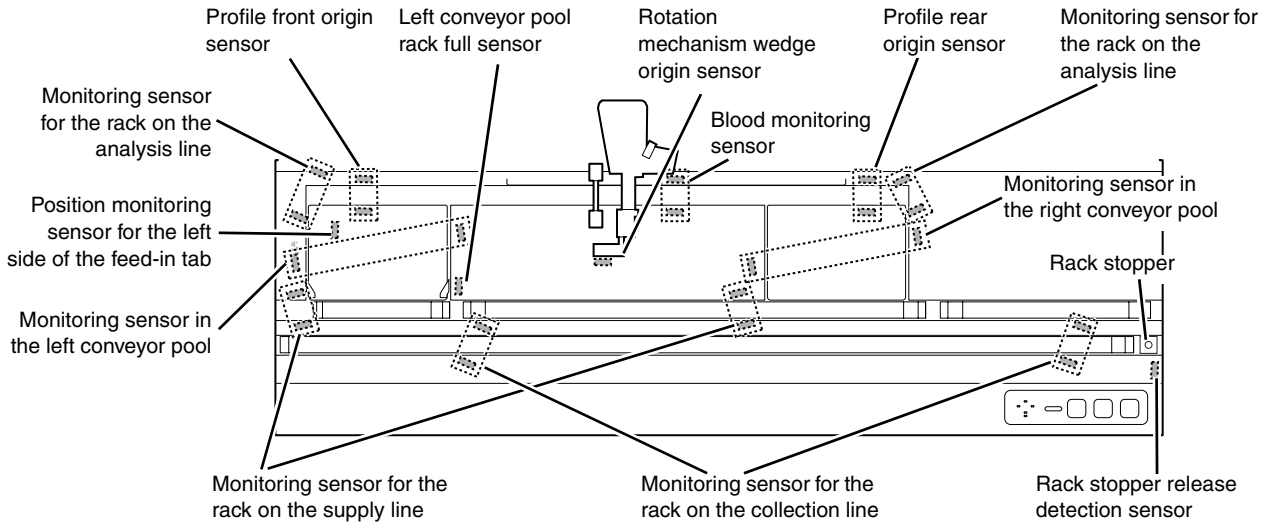
Error messages	**Rack not placed on feed-in table**
Probable Cause	The rack is not placed properly.
Actions	Reposition the rack, and then perform sampler analysis.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Rack ejection error** **Rack ejection home position error**
Probable Cause	1) There is a foreign object in the movement path of the rack feed-out lever. 2) There is a foreign object in the movement path of the racks in the left conveyor pool. 3) The feed-out movement of the rack was blocked. 4) The rack is not moving properly because the table surface of the left conveyor pool is dirty.
Actions	1) Remove the foreign object from the rack feed-out lever. 2) Remove the foreign object from the left conveyor pool. 3) Remove the racks. 4) Clean the table surface of the left conveyor pool.
Error recovery condition	Click [Accept] in the help dialog box.

Error messages	**Rack move mechanism initialization error (front belt)** **Rack move mechanism initialization error (back belt)** **Rack move error (front belt)** **Rack move error (back belt)**
Probable Cause	1) There is a foreign object in the movement path of the rack on the conveyor's analysis line. 2) The rack is not placed properly.
Actions	1) Remove the foreign object from the analysis line. 2) Remove the racks.
Error recovery condition	Click [Accept] in the help dialog box.

14.3.5 SP conveyor (CV-60)

The names and positions of the sensors attached to the CV-60 are shown below.



The structure of a CV-60

Errors related to the system

Error messages	**System Error**
Probable Cause	There was an error in the system.
Actions	Turn OFF and ON the main power to the system. If the error persists, contact your Sysmex service representative.
Error recovery condition	-

Errors related to the transportation units

Error messages	Supply Line Belt Error
Probable Cause	1) There is an invalid rack on the supply line, at the beginning or the end of the rack transport operation. 2) There is a foreign object in the movement path of the racks on the supply line.
Actions	1) Remove the rack from the supply line. If you are using the extension conveyor, remove the rack from the adjoining extension conveyor. 2) Remove the foreign object from the supply line.
Error recovery condition	Press the start switch.

Error messages	Return Line Belt Error
Probable Cause	1) There is an invalid rack on the collection line, at the beginning or the end of the rack transport operation. 2) There is a foreign object in the movement path of the racks on the collection line.
Actions	1) Remove the rack from the collection line. If you are using the extension conveyor, remove the rack from the adjoining extension conveyor. 2) Remove the foreign object from the collection line.
Error recovery condition	Press the start switch.

Error messages	Measurement Line Belt Front Error Measurement Line Belt Back Error
Probable Cause	1) There is a foreign object in the movement path of the profile. 2) The power to the sensor of the profile is OFF.
Actions	1) Remove the foreign object from the profile. 2) Press the start switch on the transportation unit.
Error recovery condition	Press the start switch.

Error messages	**Feed Arm Right Error** **Feed Arm Left Error** **Feed Hook Right Error** **Feed Hook Left Error**
Probable Cause	1) There is a foreign object in the movement path of the rack feed-out lever on the supply line. 2) There is a foreign object in the movement path of the rack feed-in lever on the analysis line.
Actions	1) Remove the foreign object from the supply line and right conveyor pool. 2) Remove the foreign object from the analysis line and left conveyor pool.
Error recovery condition	Press the start switch.

Error messages	**Elevator Table Error**
Probable Cause	There is a foreign object in the movement path of the elevator table.
Actions	Remove the foreign object from the elevator table.
Error recovery condition	Press the start switch.

Error messages	**Rack Stopper Error**
Probable Cause	There is a foreign object in the movement path of the rack stopper on the collection line.
Actions	Remove the foreign object from the collection line.
Error recovery condition	Press the start switch.

Error messages	**Rotation Mechanism Error**
Probable Cause	There is a foreign object in the movement path of the collection mechanism.
Actions	Remove the foreign object from the collection mechanism.
Error recovery condition	Press the start switch.

Error messages	Remaining Rack Detection Error
Probable Cause	An invalid rack was detected in the transportation unit during initialization.
Actions	Remove the rack from the position indicated by the rack position indicator LED.
Error recovery condition	Press the start switch.

Errors related to barcode reader

Error messages	Sample Barcode Error
Probable Cause	1) The barcode label on the sample is dirty. 2) The print quality of the barcode label on the sample is poor. 3) The position of the barcode label on the sample is off.
Actions	Check the position and cleanliness of the barcode label. If there is no problem with the label, the device must be repaired. Contact your Sysmex service representative.
Error recovery condition	Press the start switch.

Error messages	Rack Barcode Error
Probable Cause	1) The barcode label on the rack is dirty. 2) The print quality of the barcode label on the rack is poor. 3) The position of the barcode label on the rack is off.
Actions	Check the position and cleanliness of the barcode label. If there is no problem with the label, the device must be repaired. Contact your Sysmex service representative.
Error recovery condition	Press the start switch.

Errors related to communications

Error messages	**No error message. Check in the following cases:** • **The CV-60 display remains gray and does not change in the [Status] screen after startup.** • **A rack is not sent from previously connected transportation units.**
Probable Cause	A communication error occurred during startup and the CV-60 does not connect with the transportation controller.
Actions	Turn OFF the main power switch of the CV-60.
Error recovery condition	After turning off the main power of the CV-60, turn the power back on and press the startup switch*. * At this time, an error may occur in another device. Stop the alarm, wait until the device that is starting up has completed startup, and reset.

Error messages	**CT-90 Communication Error**
Probable Cause	1) The power to the transportation controller is OFF. 2) The connection with the transportation controller is broken.
Actions	1) Check if the transportation controller is started. 2) Check the connection between the transportation controller and the unit.
Error recovery condition	-

Error messages	**Analyzer Communication Error**
Probable Cause	1) The power to the analyzer is OFF. 2) The connection with the analyzer is broken.
Actions	1) Check if the analyzer is started. 2) Check the connection between the analyzer and the unit.
Error recovery condition	-

14.3.6 Transportation controller

Errors related to the system

Error messages	Setting File Error
Probable Cause	Failed to read the setting file.
Actions	Restart the transportation controller. If the error persists, contact your Sysmex technical representative.
Error recovery condition	Click [OK] in the help dialog box.

Error messages	DB System Error
Probable Cause	There was an error in the database.
Actions	Restart the transportation controller. If the error persists, contact your Sysmex technical representative.
Error recovery condition	Click [OK] in the help dialog box.

Error messages	DB Access Error
Probable Cause	There was an error when accessing the database.
Actions	Restart the transportation controller. If the error persists, contact your Sysmex technical representative.
Error recovery condition	Click [OK] in the help dialog box.

Error messages	File I/O Error
Probable Cause	Failed to write to file.
Actions	Restart the transportation controller. If the error persists, contact your Sysmex technical representative.
Error recovery condition	Click [OK] in the help dialog box.

Error messages	Socket Error
Probable Cause	Failed to generate socket.
Actions	Check the connection between the transportation controller and the unit.
Error recovery condition	Click [OK] in the help dialog box.

Errors related to the transportation units

Error messages	Unmeasured Sample Pool
Probable Cause	An unanalyzed sample was detected when collecting a rack.
Actions	Re-analyze the unanalyzed sample.
Error recovery condition	Press the alarm reset key.

Error messages	Unknown Unit Connection
Probable Cause	A unit that is not a part of the system configuration was connected.
Actions	Check the connected unit.
Error recovery condition	-

Error messages	Unit Mismatch
Probable Cause	When connecting to a unit, the settings of the unit did not match the settings in the transportation controller.
Actions	Check the connected unit.
Error recovery condition	-

Error messages	Shutdown aborted
Probable Cause	An error occurred during shutdown.
Actions	Clear all errors and repeat the shutdown operation.
Error recovery condition	Click [OK] in the help dialog box.

Errors related to communications

Error messages	**No error message. Check in the following cases:** **• There is a transportation unit that remains gray in the [Status] screen after startup.** **• A rack is not sent from previously connected transportation units.**
Probable Cause	A communication error occurred during startup, and there was a transportation unit that did not connect to the transportation controller.
Actions	Turn OFF the main power switch of the transportation unit that did not connect.
Error recovery condition	After turning off the main power of the transportation unit that did not connect, turn the power back on and press the startup switch*. * At this time, an error may occur in another device. Stop the alarm, wait until the device that is starting up has completed startup, and reset.

Error messages	**Host Communication Error**
Probable Cause	1) The power to the host computer is OFF. 2) The connection with the host computer is broken.
Actions	1) Check if the host computer is started. 2) Check the connection between the transportation controller and the host computer.
Error recovery condition	Click [OK] in the help dialog box.

Error messages	**Host Timeout**
Probable Cause	The set time (120 seconds) has elapsed since an order inquiry was sent to the host computer, but there is no response.
Actions	Check the host computer. The sample at which the error occurred is conveyed based on the default conveying setting of the transportation controller.
Error recovery condition	-

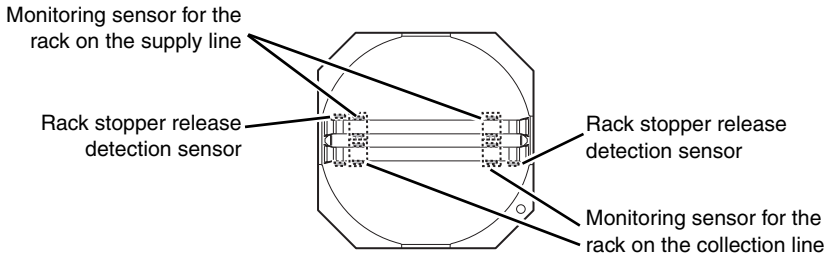
Error messages	Host Data Error
Probable Cause	The sample for which an order inquiry was made does not match the sample of the order that was received from the host computer, or the electronic message content is invalid.
Actions	Check the host computer. The sample at which the error occurred is conveyed based on the default conveying setting of the transportation controller.
Error recovery condition	-

Error messages	Unit Communication Error
Probable Cause	There was a communication error with the unit.
Actions	Check the connections with each unit.
Error recovery condition	-

Error messages	Network cable error
Probable Cause	The network cable is not connected.
Actions	Check if the network cable is connected.
Error recovery condition	Connect the network cable.

14.3.7 Turn unit (TU-40)

The names and positions of the sensors attached to the TU-40 are shown below.



The structure of a TU-40

Errors related to the system

Error messages	System Error
Probable Cause	There was an error in the system.
Actions	Turn OFF and ON the main power to the system. If the error persists, contact your Sysmex service representative.
Error recovery condition	-

Errors related to the transportation units

Error messages	Supply Line Belt Error
Probable Cause	1) There is an invalid rack on the supply line, at the beginning or the end of the rack transport operation. 2) There is a foreign object in the movement path of the racks on the supply line.
Actions	1) Remove the rack from the supply line. If you are using the extension conveyor, remove the rack from the adjoining extension conveyor. 2) Remove the foreign object from the supply line.
Error recovery condition	Press the start/stop switch.

Error messages	Return Line Belt Error
Probable Cause	1) There is an invalid rack on the collection line, at the beginning or the end of the rack transport operation. 2) There is a foreign object in the movement path of the racks on the collection line.
Actions	1) Remove the rack from the collection line. If you are using the extension conveyor, remove the rack from the adjoining extension conveyor. 2) Remove the foreign object from the collection line.
Error recovery condition	Press the start/stop switch.

Error messages	Rack Stopper Error
Probable Cause	1) There is a foreign object in the movement path of the rack stopper on the supply line. 2) There is a foreign object in the movement path of the rack stopper on the collection line.
Actions	1) Remove the foreign object from the supply line. 2) Remove the foreign object from the collection line.
Error recovery condition	Press the start/stop switch.

Error messages	Rotation Mechanism Error
Probable Cause	There is a foreign object in the movement path of the collection mechanism.
Actions	Remove the foreign object from the collection mechanism.
Error recovery condition	Press the start/stop switch.

Error messages	Remaining Rack Detection Error
Probable Cause	An invalid rack was detected in the transportation unit during initialization.
Actions	Remove the rack from the position indicated by the rack position indicator LED.
Error recovery condition	Press the start/stop switch.

Errors related to communications

Error messages	**No error message. Check in the following cases:** **• The TU-40 display remains gray and does not change in the [Status] screen after startup.** **• A rack is not sent from previously connected transportation units.**
Probable Cause	A communication error occurred during startup and the TU-40 does not connect with the transportation controller.
Actions	Turn OFF the main power switch of the TU-40.
Error recovery condition	After turning off the main power of the TU-40, turn the power back on and press the startup switch*. * At this time, an error may occur in another device. Stop the alarm, wait until the device that is starting up has completed startup, and reset.

Error messages	**CT-90 Communication Error**
Probable Cause	1) The power to the transportation controller is OFF. 2) The connection with the transportation controller is broken.
Actions	1) Check if the transportation controller is started. 2) Check the connection between the transportation controller and the unit.
Error recovery condition	-

14.4 Check the error log

14.4.1 Display the error log

The history of error occurrences can be viewed. The log data shows the information regarding the occurrence and the clearing of each error, and comments can be entered. The log can be printed or output as a file in CSV format.
For details, see Chapter 13.
(➤**P.13-68** "Chapter 13: 13.6 About the history screen", **P.13-76** "Chapter 13: 13.7 About the RU history screen")

14.4.2 Check the error log for the transportation units

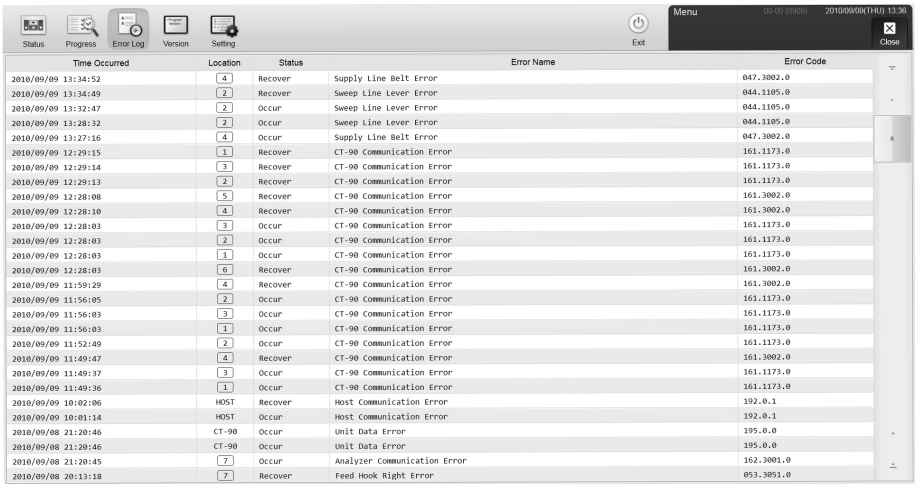
You can check the system error log for the transportation units in the transportation controller.
Follow the steps below to check the error log for the transportation units.

1 Touch the [Status] button on the toolbar in the transportation controller.

The [Status] screen appears.
For the details on the [Status] screen, see Chapter 6.
(➤**P.6-10** "Chapter 6: 6.2.2 Check system status")

2 Touch the button for the device for which you want to the check the error log.

The following screen appears.



Time Occurred	Location	Status	Error Name	Error Code
2010/09/09 13:34:52	4	Recover	Supply Line Belt Error	047.3002.0
2010/09/09 13:34:49	2	Recover	Sweep Line Lever Error	044.1105.0
2010/09/09 13:32:47	2	Occur	Sweep Line Lever Error	044.1105.0
2010/09/09 13:28:32	2	Occur	Sweep Line Lever Error	044.1105.0
2010/09/09 13:27:16	4	Occur	Supply Line Belt Error	047.3002.0
2010/09/09 12:29:15	1	Recover	CT-90 Communication Error	161.1173.0
2010/09/09 12:29:14	3	Recover	CT-90 Communication Error	161.1173.0
2010/09/09 12:29:13	2	Recover	CT-90 Communication Error	161.1173.0
2010/09/09 12:28:08	5	Recover	CT-90 Communication Error	161.3002.0
2010/09/09 12:28:10	4	Recover	CT-90 Communication Error	161.3002.0
2010/09/09 12:28:03	3	Occur	CT-90 Communication Error	161.1173.0
2010/09/09 12:28:03	2	Occur	CT-90 Communication Error	161.1173.0
2010/09/09 12:28:03	1	Occur	CT-90 Communication Error	161.1173.0
2010/09/09 12:28:03	6	Recover	CT-90 Communication Error	161.3002.0
2010/09/09 11:59:29	4	Recover	CT-90 Communication Error	161.3002.0
2010/09/09 11:56:05	2	Occur	CT-90 Communication Error	161.1173.0
2010/09/09 11:56:03	3	Occur	CT-90 Communication Error	161.1173.0
2010/09/09 11:56:03	1	Occur	CT-90 Communication Error	161.1173.0
2010/09/09 11:52:49	2	Occur	CT-90 Communication Error	161.1173.0
2010/09/09 11:49:47	4	Recover	CT-90 Communication Error	161.3002.0
2010/09/09 11:49:37	3	Occur	CT-90 Communication Error	161.1173.0
2010/09/09 11:49:36	1	Occur	CT-90 Communication Error	161.1173.0
2010/09/09 10:02:06	HOST	Recover	Host Communication Error	192.0.1
2010/09/09 10:01:14	HOST	Occur	Host Communication Error	192.0.1
2010/09/08 21:20:46	CT-90	Occur	Unit Data Error	195.0.0
2010/09/08 21:20:46	CT-90	Occur	Unit Data Error	195.0.0
2010/09/08 21:20:45	7	Occur	Analyzer Communication Error	162.3001.0
2010/09/08 20:13:18	7	Recover	Feed Hook Right Error	053.3051.0

Note:
The error log can also be displayed by touching the [Error Log] button on the toolbar.

3 Check the error log.

The following items are appears on the screen.

[Time Occurred]	Displays the date and time when the error occurred.
[Location]	Displays the name of the transportation unit where the error occurred.
[Status]	Displays the status of the error.
[Error Name]	Displays the description of the error.
[Error Code]	Displays the error code.

4 Touch [Close].

The window closes.

14.5 Check the status of the device

You can check the operation or the operation count of each unit.

14.5.1 Test proper operation of the device (sensor)

You can verify the temperature, pressure, and the operation status of each unit. The data display is updated every 0.5 seconds.

Sensor screen for the analyzer

Follow the steps below to display the sensor screen for the analyzer.

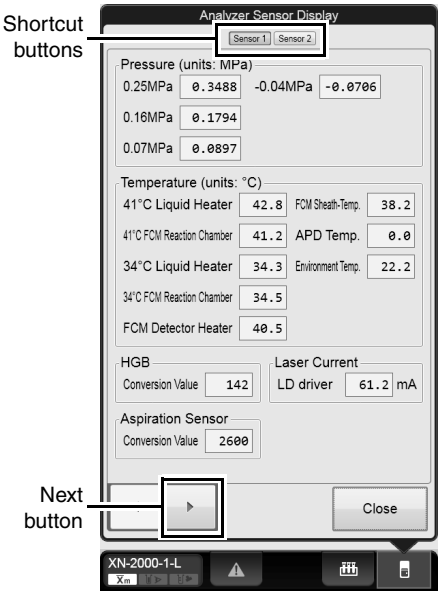
1 Display the Maintenance menu.

(➤**P.13-2** "Chapter 13: 13.1.2 Maintenance menu")

2 Click [Analyzer Sensor Display].

The dialog box on the right appears.

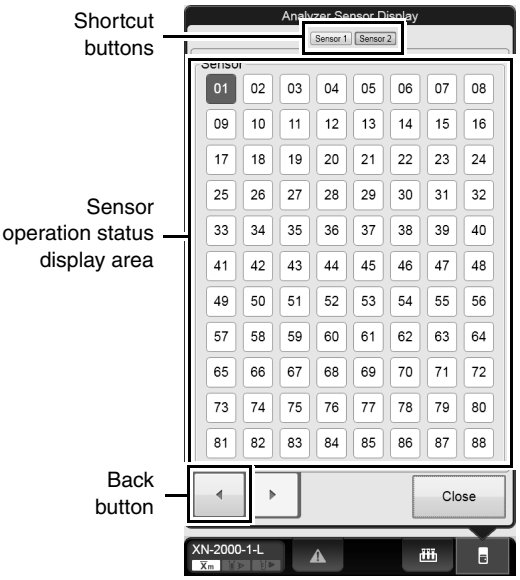
Shortcut buttons	The buttons of the dialogs that appear in the analyzer sensor display screen are displayed. Click a button of a dialog that does not currently appear to display the dialog.
[Pressure (units: Mpa)]	Displays the pressure for each unit.
[Temperature (units: °C)]	Displays the temperatures of each unit within the instrument as well as the ambient temperature. The items that are displayed vary depending on the analyzer that is connected.
[HGB]	Displays the conversion value for hemoglobin. Nothing is displayed during analysis.
[Aspiration Sensor]	Displays the conversion value for the blood aspiration sensor. Nothing is displayed during analysis.
[Laser Current]	Displays the output current of the laser.
Next button	Click to display the [Sensor 2] dialog box.



[Sensor 1] dialog box

3 Click Next button.

The dialog box on the right appears.



[Sensor 2] dialog box

Shortcut buttons	The buttons of the dialogs that appear in the analyzer sensor display screen are displayed. Click a button of a dialog that does not currently appear to display the dialog.
Sensor operation status display area	Displays the operation status of each sensor. Sensors that are ON are displayed in red, and those that are OFF are displayed in white. The following is a list of sensor numbers and sensor names.

Sensor Number	Sensor Name
[01]	Float switch 1 status (WC1)
[02]	Float switch 2 status (WC2)
[03]	Float switch 3 status (FCM)
[04]	Float switch 4 status (DIL)
[05]	Float switch 5 status (RBC)
[06]	Float switch 6 status
[07]	Start switch
[08]	Mode switch
[09]	FCM cover
[10]	Front cover sensor 1
[11]	Front cover sensor 2
[12]	RBC detector cover sensor
[13]	Water leak detecting sensor 1
[14]	Water leak detecting sensor 2
[15]	Water leak detecting sensor 3
[16]	Waste tank sensor
[17]	Dye cartridge holder monitor 1 (WNR)
[18]	Dye cartridge holder monitor 2 (WDF)

	[19]	Dye cartridge holder monitor 3 (WPC)
	[20]	Dye cartridge holder monitor 4 (RET)
	[21]	Dye cartridge holder monitor 5 (PLT)
	[25]	Sample tube identification sensor
	[26]	Hand Z-axis tube holder catch position
	[27]	Hand Z-axis sampler catch position
	[28]	Tube presence sensor
	[29]	Sample tube stabilizing unit initial position
	[38]	Water leak sensor error monitor 1
	[39]	Water leak sensor error monitor 2
	[40]	Water leak sensor error monitor 3
	[41]	Prism sensor (CELLPACK DCL)
	[43]	Prism sensor (SULFOLYSER)
	[44]	Prism sensor (Lysercell WNR)
	[45]	Prism sensor (Lysercell WDF)
	[46]	Prism sensor (CELLPACK DFL)
	[47]	Prism sensor (Lysercell WPC)
	[49]	Prism sensor (Fluorocell WNR)
	[50]	Prism sensor (Fluorocell WDF)
	[51]	Prism sensor (Fluorocell WPC)
	[52]	Prism sensor (Fluorocell DFL)
	[53]	Prism sensor (Fluorocell PLT)
	[61]	Micro collection tube monitor
	[65]	Reservoir tank: Float switch 1 status (CELLPACK DCL high)
	[66]	Reservoir tank: Float switch 2 status (CELLPACK DCL low)
	[67]	Reservoir tank: Float switch 3 status (CELLPACK DFL)
	[68]	Reservoir tank: Float switch 4 status (Lysercell WPC)
	[69]	Reservoir tank: Float switch 5 status (SULFOLYSER)
	[70]	Reservoir tank: Float switch 6 status (Lysercell WDF)
	[71]	Reservoir tank: Float switch 7 status (Lysercell WNR)
	[75]	Reservoir tank: Prism sensor (CELLPACK DCL1)
	[81]	Reservoir tank: Prism sensor (CELLPACK DCL2)
Back button	Click to display the [Sensor 1] dialog box.	

Sensor screen for the XN conveyor (CV-50)

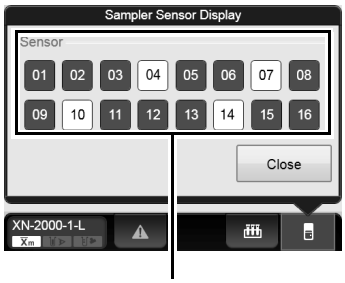
Follow the steps below to display the sensor screen for the XN conveyor (CV-50).

1 Display the Maintenance menu.

(➤**P.13-2** "Chapter 13: 13.1.2 Maintenance menu")

2 Click [Sampler Sensor Display].

The dialog box on the right appears.



Sensor operation status display area

Sensor operation status display area	Displays the operation status of each sensor. Sensors that are ON are displayed in red, and those that are OFF are displayed in white. The following is a list of sensor numbers and sensor names.	
	Sensor Number	Sensor Name
	[02]	Monitoring sensor for the rack on the analysis line (left)
	[03]	Sample tube presence monitoring sensor
	[04]	Left conveyor pool rack full sensor
	[05]	Monitoring sensor in the left conveyor pool
	[06]	Monitoring sensor for the rack on the analysis line (right)
	[07]	Blood monitoring sensor
	[11]	Monitoring sensor in the right conveyor pool
	[12]	Left table feed-out arm position sensor (back)
	[13]	Left table feed-out arm position sensor (front)

14.5.2 Check operation count (counter)

You can check the analysis count for each analysis mode/channel, or the operation count of each unit (or oscillation time of the laser). For some units, you can reset or save the operation count. To reset the operation count, the analyzer and the conveyor must be in READY state. Otherwise, the operation count cannot be reset.

> **Note:**
> Other than the piercing count, all operation/analysis counts are for reference only. They cannot be reset.

Follow the steps below to check the counters.

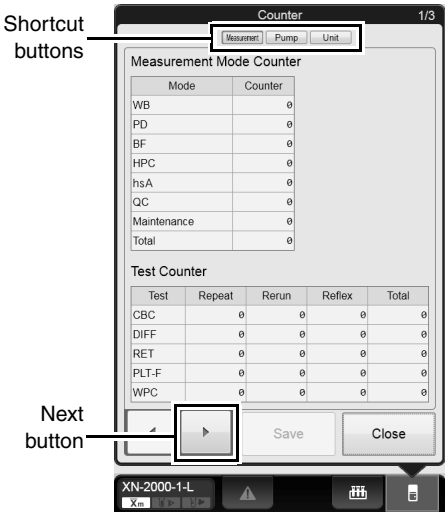
1 Display the Maintenance menu.

(➤**P.13-2** "Chapter 13: 13.1.2 Maintenance menu")

2 Click [Counter].

The dialog box on the right appears.

Shortcut buttons	The buttons of the dialogs that appear in the operation counter screen are displayed. Click a button of a dialog that does not currently appear to display the dialog.
[Mode]	Displays the name of the analysis mode. [WB]: Whole blood analysis [PD]: Dilution analysis [BF]*: Body fluid analysis [HPC]*: HPC Analysis [hsA]*: hsA Analysis [QC]: Quality control analysis [Maintenance Measurement]: Background check (Includes a background check for body fluid and hsA analysis*) [Total]: All analysis
[Counter]	Displays the analysis count by analysis mode.
[Test]	Displays the name of the test.
[Total]	Displays the total analysis count by discrete test.
[Rerun]	Displays for each discrete test the number of reruns of an analysis with the same parameters as the first test.
[Reflex]	Displays for each discrete test the number of analysis with additional parameters after the first test.
[Repeat]	Displays for each discrete test the number of retries of an analysis due to an error in the first test.
Next button	Click to display the [Pump Counter] dialog box.



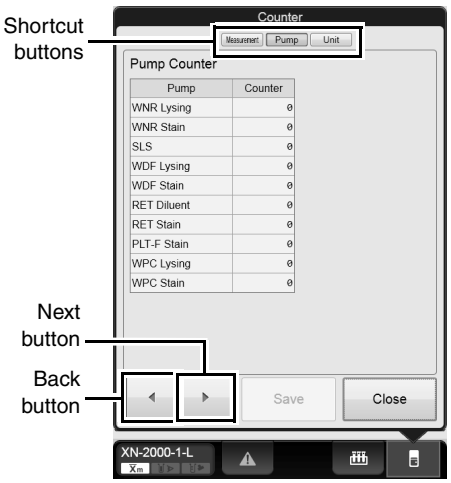
[Analysis Mode Counter] dialog box

* The availability of these functions depends on your system configuration.

3 Click Next button.

The dialog box on the right appears.

Shortcut buttons	The buttons of the dialogs that appear in the operation counter screen are displayed. Click a button of a dialog that does not currently appear to display the dialog.
[Pump]	Displays the name of the pump.
[Counter]	Displays the operation count by pump.
Back button	Click to display the [Analysis Mode Counter] dialog box.
Next button	Click to display the [Unit Counter] dialog box.

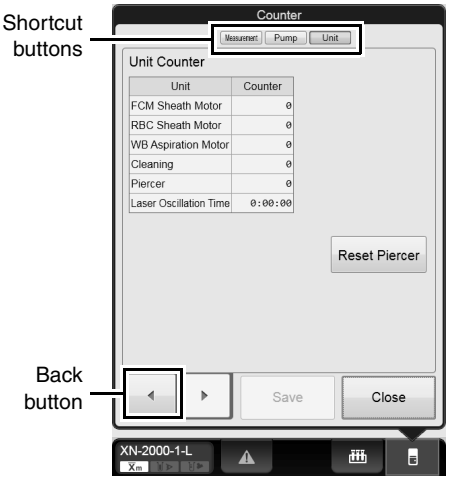


[Pump Counter] dialog box

4 Click Next button.

The dialog box on the right appears.

Shortcut buttons	The buttons of the dialogs that appear in the operation counter screen are displayed. Click a button of a dialog that does not currently appear to display the dialog.
[Unit]	Displays the unit name for which the operation count is being taken.
[Counter]	Displays the operation count of each unit (for laser, displays the oscillation time).
[Reset Piercer]	Click to set the piercer counter value to zero.
Back button	Click to display the [Pump Counter] dialog box.
[Save]	Click to store the counter value before it is reset to zero in the analyzer memory.



[Unit Counter] dialog box

5 Click [Close].

The dialog box closes.

14.6 Test proper operation of the device

You can perform various tests to verify proper operation of each unit, or to identify the cause of an error that occurred in the analyzer.
To perform the tests, the analyzer and conveyor must be in READY state. Otherwise, the tests cannot be performed. Analysis is not possible during the test process. If the test did not complete successfully, the help dialog box appears in the IPU. Troubleshoot according to the message displayed in the [Action] field in the help dialog box.

14.6.1 An operation test on the barcode reader

You can perform an operation test on the barcode reader on the analyzer.
Follow the procedure below to test the operation of the analyzer barcode reader.

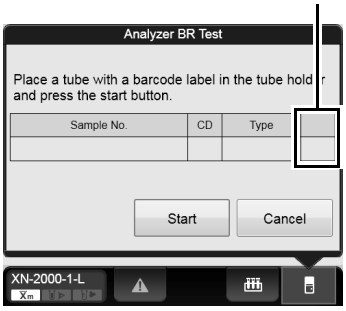
1 Display the Maintenance menu.

(➤**P.13-2** "Chapter 13: 13.1.2 Maintenance menu")

2 Click [Analyzer BR Test].

The dialog box on the right appears.

Read result display area



[Sample No.]	Displays the sample number that was read from the barcode.
[CD]	Displays the check digit of the barcode.
[Type]	Displays the type of barcode.
Read result display area	Displays the result from the read operation. One of the following symbols is displayed, depending on the result. If there was no problem with reading, nothing is displayed. [E]: Barcode reader reading error or invalid check digit. [+]: A value that is longer than the specified number of digits was read. [-]: A value that is shorter than the specified number of digits was read.

3 Set the sample tube into the tube holder, with the barcode affixed.

4 Click [Start].

The read test starts. If a previous test result was displayed, it is cleared when the test begins.
Wait until it is complete. Once the read operation completes, the result is displayed.

14.6.2 An operation test on the WB aspiration motor

Follow the steps below to perform an operation test on the WB aspiration motor.

1 Display the Maintenance menu.

(➤**P.13-2** "Chapter 13: 13.1.2 Maintenance menu")

2 Click [WB Aspiration Motor Test].

The window appears, and the WB aspiration motor test begins. Wait until it is complete. Once the test complete successfully, the window closes automatically.

14.6.3 An operation test on the sheath motor

Follow the steps below to perform an operation test on the sheath motor.

1 Display the Maintenance menu.

(➤**P.13-2** "Chapter 13: 13.1.2 Maintenance menu")

2 Click [Sheath Motor Test].

The window appears, and the sheath motor test begins. Wait until it is complete. Once the test complete successfully, the window closes automatically.

14.6.4 An operation test on the aspiration unit motor

Follow the steps below to perform an operation test on the aspiration unit motor.

1 Display the Maintenance menu.

(➤**P.13-2** "Chapter 13: 13.1.2 Maintenance menu")

2 Click [Aspiration Unit Motor Test].

The window appears, and the aspiration unit motor test begins. Wait until it is complete. Once the test complete successfully, the window closes automatically.

14.6.5 An operation test on the tube holder motor

Follow the steps below to perform an operation test on the tube holder motor.

1 Display the Maintenance menu.

(➤**P.13-2** "Chapter 13: 13.1.2 Maintenance menu")

2 Click [Tube Holder Motor Test].

The window appears, and the tube holder motor test begins. Wait until it is complete. Once the test complete successfully, the window closes automatically.

14.6.6 An operation test on the sampler

You can test the operation of the two belts that transport the racks horizontally on the analysis line.
Facing the sampler, the belt that is closer to the sampler is the front belt, and the belt that is furthest out from the sampler is the back belt.
Follow the steps below to perform an operation test on the sampler.

1 Display the Maintenance menu.

(➤**P.13-2** "Chapter 13: 13.1.2 Maintenance menu")

2 Click [Sampler Operation Test].

The dialog box on the right appears.

3 Set the rack on the analysis line.

4 Click [Front Belt Sampler Operation Test Start] or [Back Belt Sampler Operation Test Start].

A window appears, and the test for the clicked belt begins. Wait until it is complete. Once the test complete successfully, the window closes automatically.

14.6.7 An operation test on the tube grabber

Follow the steps below to perform an operation test on the tube grabber.

1 Display the Maintenance menu.

(➤**P.13-2** "Chapter 13: 13.1.2 Maintenance menu")

2 Click [Hand Test].

The window appears, and the operation test of the tube grabber begins. Wait until it is complete. Once the test complete successfully, the window closes automatically.

Chapter 15 Technical Information

This chapter explains technical information such as specifications and principles.

15.1 Performance/specifications

Note:

Channels and analysis parameters are specified depending on the connected analyzer.
For details, see Chapter 1. (➤**P.1-5** "Chapter 1: 1.3 Analysis parameters")

Operating Environment (Ambient temperature)	15 to 30°C (same with the temperature of the supplied reagent)
Operating Environment (Relative humidity)	30 to 85%
Storage Condition (Transportation)	Ambient temperature: -10 to 60°C Relative humidity: 30 to 95% (no condensation) Atmospheric pressure: 70 to 106 kPa
Dimensions (basic configuration)	Width: 4017 mm Height: 1543 mm Depth: 1150 mm
Total weight (basic configuration)	Approx. 972 kg
Pneumatic unit dimensions	Width: 280 mm Height: 400 mm Depth: 355 mm
Pneumatic unit weight	Approx. 17 kg
Power supply	Analyzer (XN-10, XN-20) AC100 to 240V (50 / 60 Hz) Pneumatic unit AC100 to 117V (50 / 60 Hz) AC220 to 240V (50 / 60 Hz) Transportation units (ST-40/41/42, BT-40, CV-50, CV-60, CV-70, TU-40) AC100 to 240V (50 / 60 Hz)
Power consumption	Analyzer (XN-10, XN-20) 270 VA or less Pneumatic unit 50 Hz: 230 VA or less (100 - 117V), 220 VA or less (220 - 240V) 60 Hz: 280 VA or less (100 - 117V), 250 VA or less (220 - 240V) Transportation units (ST-40/41/42, CV-50, CV-60, CV-70, TU-40) 120 VA or less (BT-40) 150 VA or less
Laser class	Class I (IEC60825-1:2007)
Protection type	Class I

Safety standard	IEC61010-1:2001, IEC61010-2-081:2001+A1, IEC61010-2-101:2002
Throughput **[Whole blood] mode*1** **[Low WBC] mode**	Values of the analyzer as a standalone unit are indicated below. CBC 100 samples/hour CBC+DIFF 100 samples/hour (88 samples/hour*1) CBC+DIFF+WPC*2 88 samples/hour (68 samples/hour*1) CBC+DIFF+RET*2 83 samples/hour (65 samples/hour*1) CBC+RET*2 83 samples/hour CBC+DIFF+WPC+RET*2 71 samples/hour (57 samples/hour*1) CBC+PLT-F*2 68 samples/hour CBC+DIFF+PLT-F*2 68 samples/hour (55 samples/hour*1) CBC+DIFF+WPC+PLT-F*2 53 samples/hour (45 samples/hour*1) CBC+DIFF+RET+PLT-F*2 47 samples/hour (41 samples/hour*1) CBC+RET+PLT-F*2 47 samples/hour CBC+DIFF+WPC+RET+PLT-F*2 47 samples/hour (41 samples/hour*1) *1 [Low WBC] mode. *2 These items do not appear with all analyzer types.
Throughput **[Pre-Dilution] mode**	Values of the analyzer as a standalone unit are indicated below. CBC 90 samples/hour CBC+DIFF 90 samples/hour CBC+DIFF+RET* 53 samples/hour CBC+DIFF+PLT-F* 52 samples/hour CBC+DIFF+RET+PLT-F* 39 samples/hour * These items do not appear with all analyzer types.
Throughput **[Body Fluid] mode*2**	Values of the analyzer as a standalone unit are indicated below. 40 samples/hour
Throughput **[HPC] mode*3**	Values of the analyzer as a standalone unit are indicated below. CBC+DIFF+RET+PLT-F+WPC* 16 samples/hour CBC+DIFF+RET+WPC* 18 samples/hour * These items do not appear with all analyzer types.
Sample Volume Required **[Whole blood] mode** **[Low WBC] mode**	Sampler analysis: 88 µL Manual analysis: 88 µL Micro analysis: 88 µL Micro analysis*: 88 µL RBT analysis: 88 µL * Analysis using a micro collection tube.
Sample Volume Required **[Pre-Dilution] mode**	Micro analysis: 70 µL (The blood volume required for dilution is 20 µL.) Micro analysis*: 70 µL (The blood volume required for dilution is 20 µL.) * Analysis using a micro collection tube.
Sample Volume Required **[Body Fluid] mode*2**	Manual analysis: 88 µL Micro analysis: 88 µL Micro analysis*: 88 µL * Analysis using a micro collection tube.
Sample Volume Required **[HPC] mode*3**	Manual analysis: 190 µL Micro analysis: 190 µL Micro analysis*: 190 µL * Analysis using a micro collection tube.

*1 When a Raised Bottom Tube is used, processing throughput decreases.

*2 The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.

*3 The HPC analysis can only be performed if the instrument offers the HPC analysis mode.

Analysis parameters	For details on analysis parameters, see Chapter 1. (➤**P.1-5** "Chapter 1: 1.3 Analysis parameters")
Display range	WBC: 0.00 to 999.99 x 10^3/µL RBC: 0.00 to 99.99 x 10^6/µL HGB: 0.0 to 30.0 g/dL HCT: 0.0 to 100.0% PLT: 0 to 9999 x 10^3/µL NRBC#: 0.00 to 999.99 x 10^3/µL NRBC%: 0.0 to 9999.9 / 100WBC RET%*: 0.00 to 99.99% RET#*: 0.0000 to 0.9999 x 10^6/µL IRF*: 0.0 to 100.0% LFR*: 0.0 to 100.0% MFR*: 0.0 to 100.0% HFR*: 0.0 to 100.0% WBC-BF: 0.000 to 999.999 x 10^3/µL RBC-BF: 0.000 to 99.999 x 10^6/µL MN#: 0.000 to 999.999 x 10^3/µL PMN#: 0.000 to 999.999 x 10^3/µL MN%: 0.0 to 100.0% PMN%: 0.0 to 100.0% * These items do not appear with all analyzer types.
Background limits	WBC 0.10 x 10^3/µL or less RBC 0.02 x 10^6/µL or less HGB 0.1 g/dL or less PLT*1 10 x 10^3/µL or less PLT*2,4 10 x 10^3/µL or less PLT*3,4 3 x 10^3/µL or less WBC-BF 0.001 x 10^3/µL or less RBC-BF 0.003 x 10^6/µL or less *1 PLT counted in the RBC/PLT channels (PLT particle size distribution). *2 PLT counted in the RET channels. *3 PLT counted in the PLT-F channels. *4 These items do not appear with all analyzer types.

Analysis range [Whole blood] mode [HPC] mode*1	WBC	0.00 to 440.00 x 10^3/µL
	RBC	0.00 to 8.60 x 10^6/µL
	HGB	0.0 to 26.0 g/dL, 0.0 to 16.14 mmol/L
	HCT	0.0 to 75.0%
	PLT	0 to 5000 x 10^3/µL
	NRBC#	0.00 to 20.00 x 10^3/µL
	NRBC%	0.0 to 600.0 / 100WBC
	RET%	0.00 to 30.00%
	RET#	0.0000 to 0.7200 x 10^6/µL
Analysis range [Pre-Dilution] mode	WBC	0.00 to 100.00 x 10^3/µL
	RBC	0.00 to 8.60 x 10^6/µL
	HGB	0.0 to 26.0 g/dL, 0.0 to 16.14 mmol/L
	HCT	0.0 to 75.0%
	PLT	0 to 1000 x 10^3/µL
Analysis range [Body Fluid] mode*2	WBC-BF	0.000 to 10.000 x 10^3/µL
	RBC-BF	0.000 to 5.000 x 10^6/µL
	TC-BF#	0.000 to 10.000 x 10^3/µL

*1 The HPC analysis can only be performed if the instrument offers the HPC analysis mode.

*2 The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.

Precision (repeatability) [Whole blood] mode [HPC] mode*1	Indicated as coefficients of variation (95% reliability) when analysis of peripheral blood (samples with nucleated RBC for NRBC, samples with immature granulocyte for IG (same-day blood), diluted peripheral blood for PLT*2,4 and samples with at least RET# 0.020 × 10^6/μL for RET-He (same-day blood)) or control blood is repeated at least 10 times. (For NRBC and IG, abnormal samples of peripheral blood (samples with nucleated RBC for NRBC, samples with immature granulocyte for IG (same-day blood)) repeatedly analyzed at least 5 times.)
WBC	3.0% or less (4.00 x 10^3/μL or more)
RBC	1.5% or less (4.00 x 10^6/μL or more)
HGB	1.0% or less
HCT	1.5% or less
MCV	1.0% or less
MCH	2.0% or less
MCHC	2.0% or less
PLT*1	4.0% or less (100 x 10^3/μL or more)
PLT*2,3	6.0% or less (100 x 10^3/μL or more)
PLT*2,4	2.5% or less (PLT 100 x 10^3/μL or more) 5.0% or less (PLT 20 x 10^3/μL or more)
RDW-SD	2.0% or less
RDW-CV	2.0% or less
PDW	10.0% or less
MPV	4.0% or less
P-LCR	15.0% or less
PCT	6.0% or less
NRBC#	25.0% or less, or within ±0.12 x 10^3/μL
NRBC%	25.0% or less, or within ±1.5 NRBC% (WBC 4.00 x 10^3/μL or more)
NEUT#	8.0% or less (1.20 x 10^3/μL or more)
LYMPH#	8.0% or less (0.60 x 10^3/μL or more)
MONO#	20.0% or less (0.20 x 10^3/μL or more)
EO#	25.0% or less, or within ±0.12 x 10^3/μL
BASO#	40.0% or less, or within ±0.06 x 10^3/μL
NEUT%	8.0% or less (30.0 NEUT% or more, WBC 4.00 x 10^3/μL or more)
LYMPH%	8.0% or less (15.0 LYMPH% or more, WBC 4.00 x 10^3/μL or more)
MONO%	20.0% or less (5.0 MONO% or more, WBC 4.00 x 10^3/μL or more)
EO%	25.0% or less, or within ±1.5 EO% (WBC 4.00 x 10^3/μL or more)
BASO%	40.0% or less, or within ±1.0 BASO% (WBC 4.00 x 10^3/μL or more)
IG#	25.0% or less or within ±0.12 x 10^3/μL (IG# 0.10 x 10^3/μL or more)
IG%	25.0% or less or within ±1.5 IG% (IG% 2.0% or more, WBC 4.00 x 10^3/μL or more)

Precision (repeatability) [Whole blood] mode [HPC] mode*1	RET%*2 15.0% or less (RBC 3.00 x 10^6/μL or more, RET% 1.00 to 4.00%) RET#*2 15.0% or less (RBC 3.00 x 10^6/μL or more, RET% 1.00 to 4.00%) IRF*2 30.0% or less (RBC 3.00 x 10^6/μL or more, RET% 1.00 to 4.00%, IRF 20.0% or more) LFR*2 30.0% or less (RBC 3.00 x 10^6/μL or more, RET% 1.00 to 4.00%, LFR 20.0% or more) MFR*2 50.0% or less (RBC 3.00 x 10^6/μL or more, RET% 1.00 to 4.00%, LFR 20.0% or more) HFR*2 100.0% or less or within ±2.0 HFR (RBC 3.00 x 10^6/μL or more, RET% 1.00 to 4.00%) RET-He*2 5.0% or less (RET# 0.0200 x 10^6/μL or more) IPF 25.0% or less (PLT 50 x 10^3/μL or more, IPF 3.0% or more) 20.0% or less (PLT 10 to 50 x 10^3/μL, IPF 10.0% or more) Indicates the coefficient of variation when peripheral blood (sample with HPC) is analyzed at least 5 times in succession, or the range of variation from the average value. HPC#*5 30.0% or less, or within ±15/μL *1 PLT counted in the RBC/PLT channels (PLT particle size distribution). *2 These items do not appear with all analyzer types. *3 PLT counted in the RET channels. *4 PLT counted in the PLT-F channels. *5 [HPC] mode.
Precision (repeatability) [Pre-Dilution] mode	Indicated as coefficients of variation (95% reliability) when analysis of diluted peripheral blood (samples with nucleated RBC for NRBC, samples with immature granulocyte for IG (same-day blood), and samples with at least RET# 0.020 × 10^6/μL for RET-He (same-day blood)) or control blood is repeated at least 10 times. (For NRBC and IG, abnormal samples of diluted peripheral blood (samples with nucleated RBC for NRBC, samples with immature granulocyte for IG (same-day blood)) repeatedly analyzed at least 5 times.) WBC 5.0% or less (4.00 x 10^3/μL or more) RBC 4.5% or less (4.00 x 10^6/μL or more) HGB 3.0% or less HCT 4.5% or less MCV 4.5% or less MCH 4.5% or less MCHC 6.0% or less

Precision (repeatability) [Pre-Dilution] mode	PLT*1	12.0% or less (100 x 10^3/µL or more)
	PLT*2,3	13.0% or less (100 x 10^3/µL or more)
	PLT*2,4	5.0% or less (PLT 100 x 10^3/µL or more)
		10.0% or less (PLT 20 x 10^3/µL or more)
	RDW-SD	6.0% or less
	RDW-CV	6.0% or less
	PDW	20.0% or less
	MPV	8.0% or less
	P-LCR	36.0% or less
	PCT	12.0% or less
	NRBC#	50.0% or less, or within ±0.25 x 10^3/µL
	NRBC%	50.0% or less, or within ±3.0 NRBC% (WBC 4.00 x 10^3/µL or more)
	NEUT#	16.0% or less (1.20 x 10^3/µL or more)
	LYMPH#	16.0% or less (0.60 x 10^3/µL or more)
	MONO#	40.0% or less (0.20 x 10^3/µL or more)
	EO#	40.0% or less
	BASO#	50.0% or less, or within ±0.06 x 10^3/µL
	NEUT%	16.0% or less (30.0 NEUT% or more, WBC 4.00 x 10^3/µL or more)
	LYMPH%	16.0% or less (15.0 LYMPH% or more, WBC 4.00 x 10^3/µL or more)
	MONO%	40.0% or less (5.0 MONO% or more, WBC 4.00 x 10^3/µL or more)
	EO%	40.0% or less (WBC 4.00 x 10^3/µL or more)
	BASO%	50.0% or less, or within ±1.5 BASO% (WBC 4.00 x 10^3/µL or more)
	IG#	75.0% or less, or within ±0.36 x 10^3/µL (IG# 0.10 x 10^3/µL or more)
	IG%	75.0% or less, or within ±4.5 IG% (IG% 2.0% or more, WBC 4.00 x 10^3/µL or more)
	RET%*2	35.0% or less (RBC 3.00 x 10^6/µL or more, RET% 1.00 to 4.00%)
	RET#*2	35.0% or less (RBC 3.00 x 10^6/µL or more, RET% 1.00 to 4.00%)
	IPF	40.0% or less (PLT 50 x 10^3/µL or more, IPF 3.0% or more)
	*1 PLT counted in the RBC/PLT channels (PLT particle size distribution).	
	*2 These items do not appear with all analyzer types.	
	*3 PLT counted in the RET channels.	
	*4 PLT counted in the PLT-F channels.	
Precision (repeatability) [Body Fluid] mode*2	Indicated as coefficients of variation when analysis of diluted samples of peripheral blood or control blood is repeated at least 10 times.	
	WBC-BF	30.0% or less (0.005 to 0.015 x 10^3/µL)
		15.0% or less (0.016 to 0.030 x 10^3/µL)
		10.0% or less (0.031 to 0.050 x 10^3/µL)
	RBC-BF	40.0% or Max - Min ≤ 0.007 x 10^6/µL (0.003 to 0.050 x 10^6/µL)
	TC-BF#	30.0% or less (0.005 to 0.015 x 10^3/µL)
		15.0% or less (0.016 to 0.030 x 10^3/µL)
		10.0% or less (0.031 to 0.050 x 10^3/µL)

*1 The HPC analysis can only be performed if the instrument offers the HPC analysis mode.

*2 The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.

Accuracy (blood cell count) [Whole blood] mode [HPC] mode*1	Indicated as the average value of the difference between the measured values of at least 100 samples of peripheral blood and values measured on a standard instrument or international standard methods*1 (HGB and HCT only). WBC within ±3% or ±0.20 x 10^3/µL RBC within ±2% or ±0.03 x 10^6/µL HGB within ±2% or ±0.2 g/dL HCT within ±3% or ±1.0 HCT MCV within ±3% or ±2.0 fL Indicated as a correlation factor with the reference data when at least 100 samples of peripheral blood are analyzed. The reference data are obtained by the standard analysis method or standard instrument method (IPF only) by the flow cytometry method based on the international standards. PLT*2 within ±5% or ±10 x 10^3/µL PLT*3,5 within ±7% or ±10 x 10^3/µL PLT*4,5 within ±5% or ±10 x 10^3/µL MPV within ±5% or ±1.0 fL (PLT 100 x 10^3/µL or more) PCT within ±5% or ±0.03 PCT (PLT 100 x 10^3/µL or more) IPF*5 r = 0.8 or more Indicated as a tolerance with respect to the average value reference data when at least 20 samples of peripheral blood are analyzed. The reference data are obtained by the standard analysis method using the flow cytometry method based on the CD34 positive cell analysis method. HPC#*6 within ±30.0%, or ±10/µL *1 In the case of HGB, the hemoglobin analysis method using the cyanmethemoglobin (HiCN) method in accordance with the recommendations of the ICSH (International Council for Standardization in Haematology). In the case of HCT, the standard analysis method in accordance with the recommendations of the ICSH (International Council for Standardization in Haematology). *2 PLT counted in the RBC/PLT channels (PLT particle size distribution). *3 PLT counted in the RET channels. *4 PLT counted in the PLT-F channels. *5 These items do not appear with all analyzer types. *6 [HPC] mode.

Accuracy (blood cell count) [Pre-Dilution] mode	Indicated as the average value of the difference between the measured values of at least 100 samples of diluted peripheral blood and values measured on a standard instrument or international standard methods*1 (HGB and HCT only). WBC within ±10% RBC within ±8% HGB within ±5% HCT within ±4% or ±2.0HCT MCV within ±4% or ±3.0 fL Indicated as a correlation factor with the reference data when at least 100 samples of diluted peripheral blood are analyzed. The reference data are obtained by the standard analysis method or standard instrument method (IPF only) by the flow cytometry method based on the international standards. PLT*2 within ±10% PLT*3,5 within ±15% PLT*4,5 within ±10% MPV within ±7% or ±1.5 fL (PLT 100 x 10^3/μL or more) PCT within ±7% or ±0.04 PCT (PLT 100 x 10^3/μL or more) IPF*5 r = 0.5 or more *1 In the case of HGB, the hemoglobin analysis method using the cyanmethemoglobin (HiCN) method in accordance with the recommendations of the ICSH (International Council for Standardization in Haematology). In the case of HCT, the standard analysis method in accordance with the recommendations of the ICSH (International Council for Standardization in Haematology). *2 PLT counted in the RBC/PLT channels (PLT particle size distribution). *3 PLT counted in the RET channels. *4 PLT counted in the PLT-F channels. *5 These items do not appear with all analyzer types.
Accuracy (blood cell count) [Body Fluid] mode*2	Indicates the correlation with the reference method and the slope of the regression line when 50 or more body fluid samples are analyzed. The reference data are obtained by the visual observation method. WBC-BF r=0.9 or more, and within slope=1 ±0.3 RBC-BF r=0.8 or more, and within slope=1 ±0.3 TC-BF# r=0.9 or more, and within slope=1 ±0.3

*1 The HPC analysis can only be performed if the instrument offers the HPC analysis mode.

*2 The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.

Accuracy (differential blood count) [Whole blood] mode [HPC] mode*1	Indicated as a correlation factor with the reference data when at least 100 samples (at least 20 samples for NRBC and IG) of peripheral blood (samples with nucleated RBC for NRBC, samples with immature granulocyte for IG) are analyzed. The reference data is obtained by a standard analysis method that uses the flow cytometry method, based on the standard instrument, standard 5-category white blood cell analysis method, standard NRBC analysis method, or standard immature granulocyte analysis method. NRBC% r = 0.80 or more NEUT% r = 0.90 or more LYMPH% r = 0.90 or more MONO% r = 0.75 or more EO% r = 0.80 or more BASO% r = 0.50 or more IG% r = 0.80 or more Indicated as the average value of the difference between the measured values of at least 100 samples (at least 20 samples for NRBC and IG) of peripheral blood (samples with nucleated RBC for NRBC, samples with immature granulocyte for IG) and values measured on a standard instrument. NEUT% within ±3.0 NEUT% LYMPH% within ±3.0 LYMPH% MONO% within ±2.0 MONO% EO% within ±1.0 EO% BASO% within ±1.0 BASO% IG% within ±1.5 IG%

Accuracy (differential blood count) [Pre-Dilution] mode	Indicated as a correlation factor with the reference data when at least 100 samples (at least 20 samples for NRBC and IG) of diluted peripheral blood (samples with nucleated RBC for NRBC, samples with immature granulocyte for IG) are analyzed. The reference data is obtained by a standard analysis method that uses the flow cytometry method, based on the standard instrument, standard 5-category white blood cell analysis method, standard NRBC analysis method, or standard immature granulocyte analysis method. NRBC% r = 0.70 or more NEUT% r = 0.70 or more LYMPH% r = 0.70 or more MONO% r = 0.60 or more EO% r = 0.60 or more BASO% r = 0.50 or more Indicated as the average value of the difference between the measured values of at least 100 samples (at least 20 samples for NRBC and IG) of diluted peripheral blood (samples with nucleated RBC for NRBC, samples with immature granulocyte for IG) and values measured on a standard instrument. NEUT% within ±3.0 NEUT% LYMPH% within ±3.0 LYMPH% MONO% within ±2.0 MONO% EO% within ±1.0 EO% BASO% within ±1.0 BASO%
Accuracy (differential blood count) [Body Fluid] mode*2	Indicates the correlation with the reference method and the slope of the regression line when 50 or more body fluid samples are analyzed. The reference data are obtained by a method in which slides created by sight spin method are visually classified. MN# r = 0.9 or more, and within slope=1 ±0.5 PMN# r = 0.9 or more, and within slope=1 ±0.5 MN% r = 0.7 or more, and within slope=1 ±0.5 PMN% r = 0.7 or more, and within slope=1 ±0.5

*1 The HPC analysis can only be performed if the instrument offers the HPC analysis mode.

*2 The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.

Accuracy (reticulocyte parameters*1) [Whole blood] mode [HPC] mode*2	Indicated as a correlation factor with the reference data when at least 100 samples of peripheral blood are analyzed. The reference data are obtained by the standard instrument method or the visual observation method. RET% r = 0.90 or more RET# r = 0.90 or more RET-He r = 0.9 or more (More than the half of the samples are RET# 0.020 x 10^6/µL or more) Indicated as the average value of the difference between the measured values of at least 100 samples of peripheral blood and values measured on a standard instrument. RET% within ±20% or ±0.30 RET% RET# within ±20% or ±0.0150 x 10^6/µL IRF within ±30% or ±10.0 IRF (within 40.0 IRF*) LFR within ±30% or ±10.0 LFR (within 35.0 LFR*) MFR within ±30% or ±10.0 MFR (within 30.0 MFR*) HFR within ±30% or ±5.0 HFR (within 15.0 HFR*) * Control blood or calibrator
Accuracy (reticulocyte parameters*1) [Pre-Dilution] mode	Indicated as a correlation factor with the reference data when at least 100 samples of diluted peripheral blood are analyzed. The reference data are obtained by the standard instrument method or the visual observation method. RET% r = 0.80 or more RET# r = 0.80 or more RET-He r = 0.7 or more Indicated as the average value of the difference between the measured values of at least 100 samples of diluted peripheral blood and values measured on a standard instrument. RET% within ±30% or ±0.50 RET% RET# within ±30% or ±0.020 x 10^6/µL IRF within ±50% or ±10.0 IRF LFR within ±50% or ±10.0 LFR MFR within ±50% or ±10.0 MFR HFR within ±50% or ±5.0 HFR

*1 These items do not appear with all analyzer types.

*2 The HPC analysis can only be performed if the instrument offers the HPC analysis mode.

Linearity **[Whole blood] mode** **[HPC] mode***	Indicated as a logical value or a residual or residual rate with respect to the value measured on a standard instrument. WBC within ±3% or ±0.20 x 10^3/µL (0.00 to 100.00 x 10^3/µL) within ±6% (100.01 to 310.00 x 10^3/µL) within ±11% (310.01 to 440.00 x 10^3/µL) RBC within ±2% or ±0.03 x 10^6/µL (0.00 to 8.00 x 10^6/µL) within ±4% or ±0.06 x 10^6/µL (8.01 to 8.60 x 10^6/µL) HGB within ±2% or ±0.2 g/dL (0.0 to 25.0 g/dL, 0.00 to 15.52 mmol/L) within ±5% or ±0.5 g/dL (25.1 to 26.0 g/dL, 15.53 to 16.14 mmol/L) HCT within ±3% or ±1.0 HCT (0.0 to 75.0%) PLT*1 within ±5% or ±10 x 10^3/µL (0 to 1000 x 10^3/µL) within ±6% (1001 to 5000 x 10^3/µL) PLT*2,4 within ±7% or ±10 x 10^3/µL (0 to 5000 x 10^3/µL) PLT*3,4 within ±5% or ±10 x 10^3/µL (0 to 1000 x 10^3/µL) within ±6% (1001 to 5000 x 10^3/µL) NRBC# within ±10% or ±0.20 x 10^3/µL (0.00 to 20.00 x 10^3/µL) NRBC% within ±20% or ±2.0 NRBC% (0.0 to 600.0/100WBC) RET%*4 within ±20% or ±0.30 RET% (0.00 to 30.00%) RET#*4 within ±20% or ±0.0150 x 10^6/µL (0.0000 to 0.7200 x 10^6/µL) *1 PLT counted in the RBC/PLT channels (PLT particle size distribution). *2 PLT counted in the RET channels. *3 PLT counted in the PLT-F channels. *4 These items do not appear with all analyzer types.
Linearity **[Body Fluid] mode***	Indicated as a logical value or a residual or residual rate with respect to the value measured on a standard instrument. This specification is based on the verification using control blood. WBC-BF within ±0.010 x 10^3/µL (0.000 to 0.050 x 10^3/µL, RBC < 1.000 x 10^6/µL) within ±20% (0.051 to 10.000 x 10^3/µL, RBC < 1.000 x 10^6/µL) RBC-BF within ±2% or ±0.010 x 10^6/µL (0.000 to 5.000 x 10^6/µL) TC-BF# within ±0.010 x 10^3/µL (0.000 to 0.050 x 10^3/µL, RBC < 1.000 x 10^6/µL) within ±20% (0.051 to 10.000 x 10^3/µL, RBC < 1.000 x 10^6/µL)

* The availability of these functions depends on your system configuration.

Carryover **[Whole blood] mode** **[Pre-Dilution] mode** **[HPC] mode*1**	WBC	1.0% or less
	RBC	1.0% or less
	HGB	1.0% or less
	HCT	1.0% or less
	PLT	1.0% or less
	NRBC#	2.0% or 0.02 x 10^3/µL or less
	NEUT#	2.0% or 0.05 x 10^3/µL or less
	LYMPH#	2.0% or 0.05 x 10^3/µL or less
	MONO#	2.0% or 0.03 x 10^3/µL or less
	EO#	2.0% or 0.03 x 10^3/µL or less
	BASO#	2.0% or 0.03 x 10^3/µL or less
Carryover **[Body Fluid] mode*2**	WBC-BF	0.3 % or 0.001 x 10^3/µL or less
	RBC-BF	0.3 % or 0.003 x 10^6/µL or less
	TC-BF#	0.3 % or 0.001 x 10^3/µL or less

*1 The HPC analysis can only be performed if the instrument offers the HPC analysis mode.

*2 The body fluid analysis can only be performed if the instrument offers the body fluid analysis mode.

Sample Stability with Time after Blood Collection	Changes after blood is taken are shown below.	
8 hours	HCT	within +5.0%
	MCV	within +5.0%
24 hours	HCT	within +8.0% (in a refrigerator), within +15.0% (stored at 18 to 26°C)
	MCV	within +8.0% (in a refrigerator), within +15.0% (stored at 18 to 26°C)
	NRBC%	within ±10.0% or ± 3.0 / 100 WBC
	IG%	within ±2.0 IG%
	RET%*1	within ± 20.0% or ±0.3 RET%
	RET#*1	within ± 20.0% or ±0.015 x 10^6/µL
	IRF*1	within ± 30.0% or ±10.0 IRF
	LFR*1	within ± 30.0% or ±10.0 LFR
	MFR*1	within ± 30.0% or ±10.0 MFR
	HFR*1	within ± 30.0% or ±5.0 HFR
	RET-He*1	within ± 8.0% (RET# 0.0100 x 10^6/µL or more)
	IPF	within ± 30.0% or ±2.0 IPF% (PLT 100 x 10^3/µL or more, IPF 2.0% or more)
36 hours	NEUT%	within ±8.0 NEUT%
	LYMPH%	within ±7.0 LYMPH%
	MONO%	within ±3.0 MONO%
	EO%	within ±3.0 EO%
	BASO%	within ±1.0 BASO%
48 hours	PLT*2	within ±10% or ± 30 x 10^3/µL
	PLT*1,3	within ±15.0%
	PLT*1,4	within ±10.0% or ± 30 x 10^3/µL
	NEUT%	within ±8.0 NEUT%
	LYMPH%	within ±7.0 LYMPH%
	MONO%	within ±4.0 MONO%
	EO%	within ±3.0 EO%
	BASO%	within ±1.0 BASO%
72 hours	WBC	within ±10.0%
	RBC	within ±5.0%
	HGB	within ±5.0%

*1 These items do not appear with all analyzer types.
*2 PLT counted in the RBC/PLT channels (PLT particle size distribution).
*3 PLT counted in the RET channels.
*4 PLT counted in the PLT-F channels.

Note:

The data are the values when analyzing the samples stored at 18 to 26°C or in a refrigerator (2 to 8°C). If the samples were refrigerated, they were restored to room temperature before analyzing. Depending on how the samples were stored, the values may not fall within the above range.

Data Storage Capacity	Samples stored:	100,000 samples
	Patient information:	10,000 records
	Wards registered:	200 wards
	Doctor names registered:	200 names
	Analysis registration function:	2,000 records
	QC files:	99 files per analyzer (300 plots per file)
	Reagent replacement history:	5,000 records
	Maintenance history:	5,000 records
Quality Control	X-bar control (L-J control):	300 plots x 94 files
	X-barM control:	300 plots x 5 files

15.2 System limits

15.2.1 Possible sample interferences

WBC

If any of the following is present, the system may erroneously report a low white blood cell count.

- Leukocyte aggregation

If any of the following is present, the system may erroneously report a high white blood cell count.

- Possibility of PLT clumps
- Cryoprotein
- Cryoglobulin
- Fibrin
- Giant platelets (Platelets > 1,000,000/µL)

RBC

Where the following are present, the system may erroneously report a low red blood cell count.

- Erythrocyte aggregation (Cold agglutinin)
- Microerythrocytes
- Possibility of fragmented RBCs

If any of the following is present, the system may erroneously report a high red blood cell count.

- Leukocytosis (> 100,000/µL)
- Giant platelets (Platelets > 1,000,000/µL)

HGB

If any of the following is present, the system may erroneously report a high hemoglobin concentration.

- Leukocytosis (> 100,000/µL)
- Lipemia
- Abnormal protein

HCT

If any of the following is present, the system may erroneously report a low hematocrit value.

- Erythrocyte aggregation (Cold agglutinin)
- Microerythrocytes
- Possibility of fragmented RBCs

If any of the following is present, the system may erroneously report a high hematocrit value.

- Leukocytosis (> 100,000/µL)
- Severe diabetes
- Uremia
- Spherocytosis

PLT

If any of the following is present, the system may erroneously report a low platelet count.

- Possibility of PLT clumps
- Pseudothrombocytopenia
- Giant platelets

If any of the following is present, the system may erroneously report a high platelet count.

- Microerythrocytes
- Possibility of fragmented RBCs
- Fragmented leukocytes
- Cryoprotein
- Cryoglobulin

RET

If any of the following is present, the system may erroneously report a high reticulocyte count.

- Erythrocyte aggregation (Cold agglutinin)
- Giant platelets
- Possibility of PLT clumps
- Fragmented leukocytes
- Malaria
- Howell-Jolly body

15.3 Program version

- To find out the version of your current program of the IPU, click the [Version Information] icon in the Menu screen.
- When using the RU-20, the current RU-20 program version can be checked by clicking the [Show Status] button in the RU menu.
- To check the version of the transportation controller or a transportation unit, touch the [Version] button on the toolbar in the transportation controller.

15.4 Functional descriptions

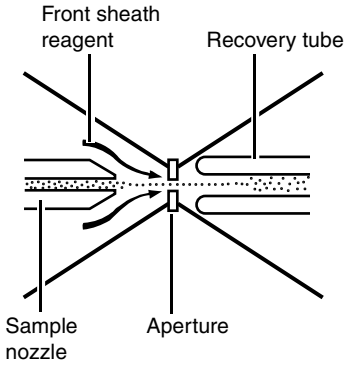
This device performs hematology analyses according to the Hydro Dynamic Focusing (DC Detection), flow cytometry method (using a semiconductor laser), and SLS-hemoglobin method.

15.4.1 Analysis principles

Hydro Dynamic Focusing (DC Detection)

The RBC detector counts the RBC and PLT via the Hydro Dynamic Focusing (DC Detection). At the same time, the hematocrit (HCT) is calculated via the RBC pulse height detection method.

Inside the detector, the sample nozzle is positioned in front of the aperture and in line with the center. After diluted sample is forced from the sample nozzle into the conical chamber, it is surrounded by front sheath reagent and passes through the aperture center.

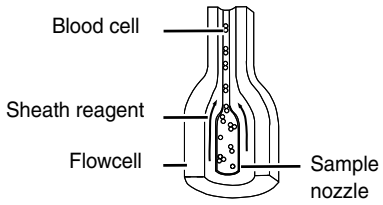


After passing through the aperture, the diluted sample is sent to the catcher tube. This prevents the blood cells in this area from drifting back, and prevents the generation of false platelet pulses. The Hydro Dynamic Focusing method improves blood count accuracy and repeatability. And because the blood cells pass through the aperture in a line, it also prevents the generation of abnormal blood cell pulses.

Flow cytometry method using semiconductor laser

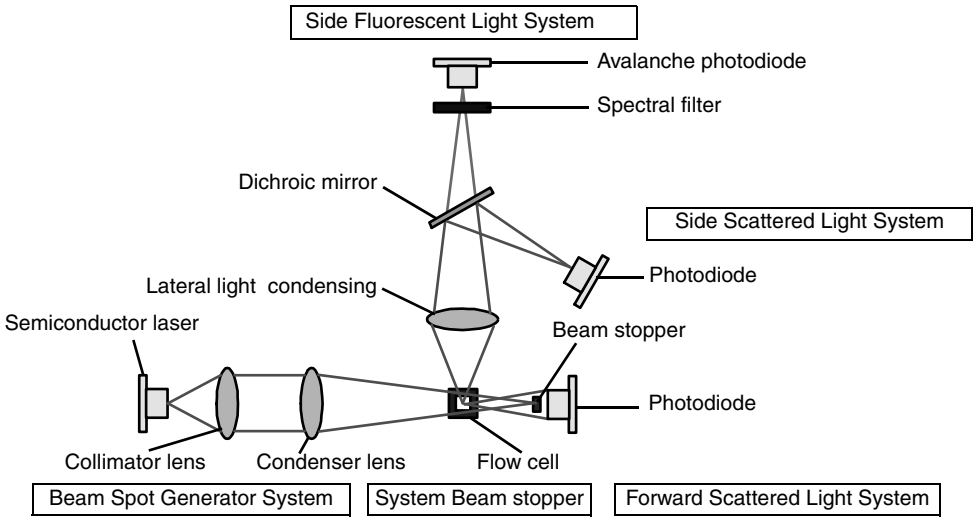
Cytometry is used to analyze physiological and chemical characteristics of cells and other biological particles. Flow cytometry is used to analyze those cells and particles as they are passed through extremely small flow cells.

A blood sample is aspirated and measured, diluted to the specified ratio, and stained. The sample is then fed into the flow cells.



This Hydro Dynamic Focusing mechanism improves cell count accuracy and repeatability. And since the blood cell particles pass in a line through the center of the flow cell, the generation of abnormal blood pulses is prevented and flow cell contamination is reduced.

A semiconductor laser beam (wavelength: 633 nm) is emitted to the blood cells passing through the flow cell. The forward scattered light and side scattered light is captured by the photodiode, and the side fluorescent light is captured by the avalanche photodiode. This light is converted into electrical pulses, thus making it possible to obtain blood cell information.



• Forward Scattered Light and Side Scattered Light

When obstacles pass through a light path, the light beam scatters from each obstacle in various directions. This phenomenon is called light scattering. By detecting the scattered light, it is possible to obtain information on cell size and material properties.

Likewise, when a laser beam is emitted to blood cell particles, light scattering occurs. The intensity of the scattered light depends on factors such as the particle diameter and viewing angle. This device detects forward scattered light, which provides information on blood cell size; and side scattered light, which provides information on the cell interior (such as the size of the nucleus).

• Side Fluorescent Light

When light is emitted to fluorescent material, such as stained blood cells, light of longer wavelength than the original light is produced. The intensity of the fluorescent light increases as the concentration of the stain becomes higher. By measuring the intensity of the fluorescence emitted, you can obtain information on the degree of blood cell staining. Fluorescent light is emitted in all directions; this device detects the fluorescent light that is emitted sideways.

SLS-Hemoglobin Method

In the past, the mainstream methods for automatically measuring hemoglobin were the cyanmethemoglobin method and oxyhemoglobin method. But these methods have both advantages and disadvantages when they are used with a large, fully automatic instrument such as this instrument.
The cyanmethemoglobin method was recommended by the International Committee for Standardization in Hematology (ICSH) in 1966 as an international standard method. But since its hemoglobin conversion speed is slow and multiple-sample processing is an assumed requirement, this method is not really appropriate for automatic analysis. Moreover, since it uses cyanide compounds, which are poisonous as reagents, the liquid waste must be treated, making the method undesirable from an environmental perspective.
Currently, this is not an appropriate analysis method, particularly as a large fully automatic instrument that discharges large amounts of liquid waste.

In contrast, the hemoglobin conversion speed of the oxyhemoglobin method is fast, as blood hemoglobin is instantly converted into oxyhemoglobin. And since it does not use poisonous substances such as cyanide, it is a suitable method for performing automatic analysis. It cannot, however, convert methemoglobin into oxyhemoglobin, which is not a problem for normal human blood, but will result in values that are lower than the true values for samples that contain large amounts of methemoglobin, such as control blood samples.
The SLS-hemoglobin method is an analysis method that makes use of the advantages of the two aforementioned methods.

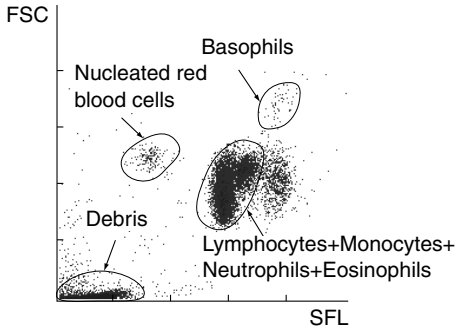
As with the oxyhemoglobin method, the hemoglobin conversion speed of the SLS-hemoglobin method is fast and the method does not use poisonous substances, making it a suitable method for automation.
Further, since methemoglobin can be analyzed, control samples such as blood containing methemoglobin can also be accurately analyzed.

15.4.2 Analysis parameters and channels

WBC analysis

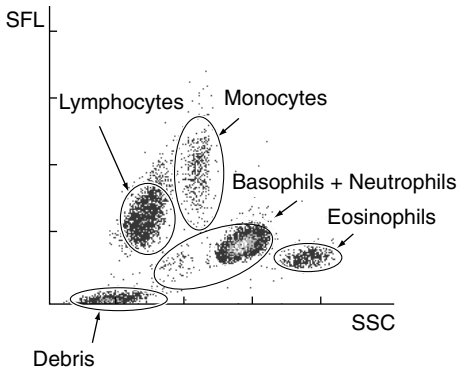
WNR channel

The WNR channel is primarily a channel to count the white blood cells and nucleated red blood cells.
By flow cytometry method using a semiconductor laser, a two-dimensional scattergram is plotted, with the X-axis representing the intensity of the side fluorescent light (SFL), and the Y-axis representing the intensity of the forward scattered light (FSC).
This scattergram displays groups of nucleated red blood cells, basophil, non-basophil white blood cells, and debris (hemolyzed red blood cells and platelets).



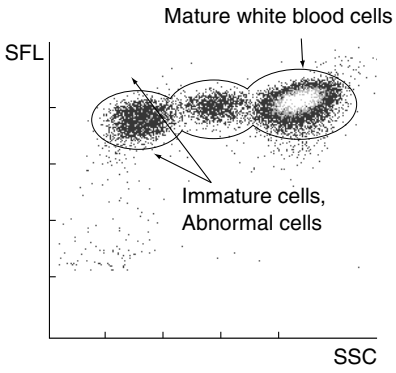
WDF channel

The WDF channel is primarily a channel for classifying white blood cells.
By flow cytometry method using a semiconductor laser, a two-dimensional scattergram is plotted, with the X-axis representing the intensity of the side scattered light (SSC) and the Y-axis representing the intensity of the side fluorescent light (SFL).
This scattergram displays groups of lymphocytes, monocytes, eosinophils, basophils + neutrophils, and debris.



WPC channel

The WPC channel is a channel for detecting immature cells such as myeloblasts, and abnormal lymphocytes.
By flow cytometry method using a semiconductor laser, a two-dimensional scattergram is plotted, with the X-axis representing the intensity of the side scattered light (SSC) and the Y-axis representing the intensity of the side fluorescent light (SFL).
This scattergram displays groups of immature cells, abnormal cells, and mature white blood cells.



RBC/PLT analysis

Calculation of RBC constants

The red blood cell constants (mean cell volume, mean cell hemoglobin, and mean cell hemoglobin concentration) are calculated from the RBC, HGB, and HCT.

● MCV (Mean cell volume)

The MCV is calculated from the RBC and HCT, using the following equation:

$$\text{MCV (fL)} = \frac{\text{HCT (\%)}}{\text{RBC (x } 10^6/\mu\text{L)}} \text{ x } 10$$

● MCH (Mean cell hemoglobin)

The MCH is calculated from the RBC and HGB, using the following equation:

$$\text{MCH (pg)} = \frac{\text{HGB (g/dL)}}{\text{RBC (x } 10^6/\mu\text{L)}} \text{ x } 10$$

● MCHC (Mean cell hemoglobin concentration)

The MCHC is calculated from the HCT and HGB, using the following equation:

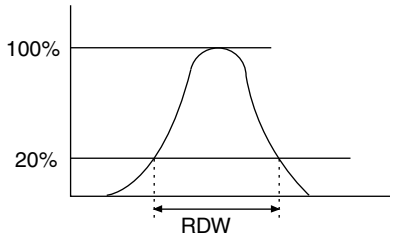
$$\text{MCHC (g/dL)} = \frac{\text{HGB (g/dL)}}{\text{HCT (\%)}} \text{ x } 100$$

RBC particle size distribution

The RBC (red blood count) is calculated as a particle count between two discriminators (lower discriminator (LD) and upper discriminator (UD)), which are automatically set up in the ranges of 25 - 75 fL and 200 - 250 fL, respectively.
The particle size distribution is checked for abnormal relative frequencies at each discriminator level, existence of more than one peaks, and abnormal distribution width.
In this instrument, the RBC distribution width (RDW) is expressed in the following two ways.

● RDW-SD

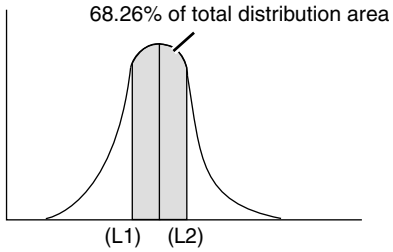
With the peak height assumed to be 100%, the distribution width at the 20% frequency level is RDW-SD.
The unit used is femtoliter (fL) (1 fL = 10^{-15} L).



● RDW-CV

With points L1 and L2 found at a frequency of 68.26% of the total distribution area, RDW-CV is calculated from the following equation:

$$\text{RDW-CV (\%)} = \frac{L2 - L1}{L2 + L1} \times 100$$



PLT particle size distribution

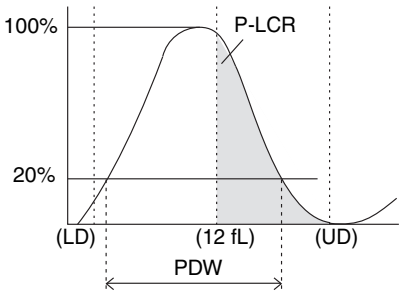
The PLT (platelet count) is calculated as a particle count between two discriminators (lower discriminator (LD) and upper discriminator (UD)), which are automatically set up in the ranges of 2 - 6 fL and 12 - 30 fL, respectively.
PLT particle size distributions are checked for abnormalities, including abnormal relative frequencies at the lower discriminator, abnormal distribution widths, and the existence of more than one peak.

● PDW (Calculated distribution width of platelets)

With the peak height assumed to be 100%, the distribution width at the 20% frequency level is PDW.
The unit used is femtoliter (fL) (1 fL = 10^{-15} L).

● P-LCR (Platelet-Large Cell Ratio)

The P-LCR is the ratio of large platelets from the 12 fL discriminator or larger. It is calculated as a ratio comparing the number of particles between the fixed discriminator and UD, to the number of particles between LD and UD.



● MPV (Mean Platelet Volume)

The MPV is calculated from the following equation:

$$\text{MPV (fL)} = \frac{\text{PCT (\%)}}{\text{PLT (x } 10^3/\mu\text{L)}} \times 10000$$

PCT: PCT is called the platelet hematocrit or platelet volume ratio, and is weighted toward the PLT frequency.

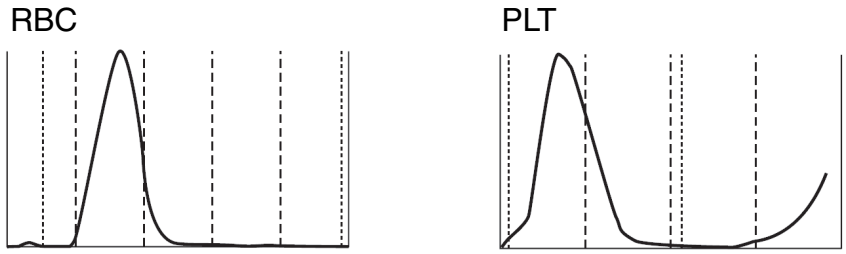
Particle size distribution expression

The impression one receives of a particle size distribution can vary greatly, depending on the way in which it is expressed. The width of a particle size distribution requires particular attention, because it can appear completely different, depending on the expression used for the distribution.
The instrument utilizes a conventional particle size distribution expression (normal expression) and a particle size distribution expression method that enables the user to obtain a large amount of information from the particle size distribution intuitively (normal cell size range expression).

● Normal expression

With the peak of the particle size distribution set as full scale (maximum height when the particle size distribution is displayed), this method of expression normalizes and expresses the distribution.

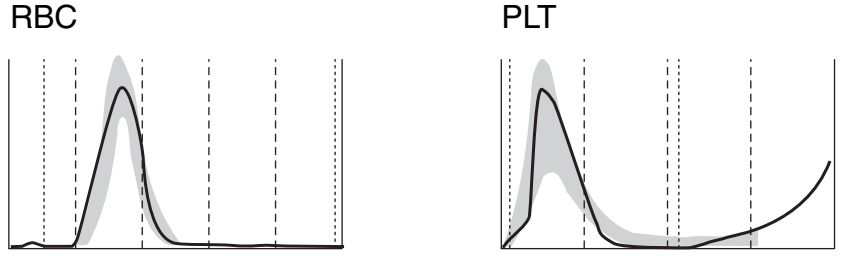
- Features: Patterns of particle size distributions whose counts are different can be viewed on the same scale. Widths of particle size distributions can be compared intuitively.
- Displays Supported area: RBC and PLT particle size distributions



● Normal cell size range expression

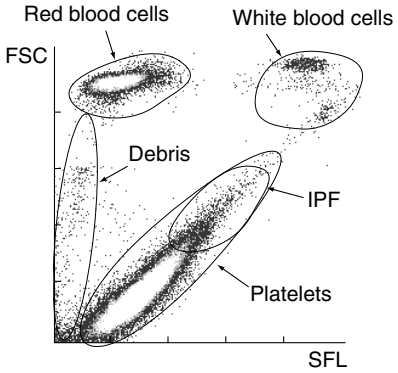
This method of expression does not consider the peak of the particle size distribution as the full scale (maximum height when the particle size distribution is displayed). Instead, it normalizes the distribution, with the peak of the normal cell size range, which was calculated empirically, set as the full scale. At the same time, this method overplays the normal range of the particle size distribution.
If, however, the peak of the particle size distribution is higher than the peak of the normal cell size range, the expression is made with the distribution peak set as full scale. In this case, the normal cell size range is proportionally smaller than the height of the particle size distribution peak.
A normal cell size range can be obtained by superposing the particle size distributions of a large number of healthy people and then utilizing the region from the 10th percentile to the 90th percentile.

- Features: The viewer can intuitively see the size of the particle count from the particle size distribution.
  If the particle size distribution strays from the normal range, the viewer knows instantly that the particle size distribution pattern is abnormal.
- Displays Supported area: RBC and PLT particle size distributions if settings are preset to normal range



PLT-F channel*

The PLT-F channel is for accurately measuring platelets, especially for low platelet counts.
By flow cytometry method using a semiconductor laser, a two-dimensional scattergram is plotted, with the X-axis representing the intensity of the side fluorescent light (SFL), and the Y-axis representing the intensity of the forward scattered light (FSC).
This scattergram displays groups of platelets, part of red blood cells, part of white blood cells, and debris.
The IPF is obtained as a ratio of platelet count in the area with strong fluorescent light intensity in the PLT-F scattergram (IPF zone), to the total platelet count.



IPF(Immature Platelet Fraction):

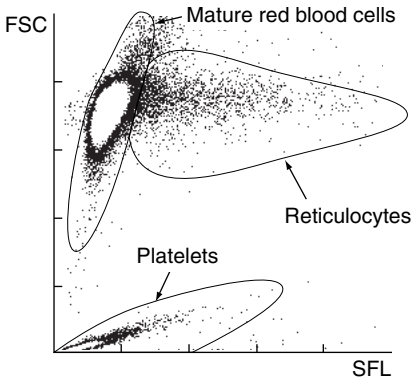
$$IPF = \frac{\text{Particle count in IPF zone}}{\text{Particle count in the platelet zone}} \times 100$$

* Cannot be used depending on the analyzer type.

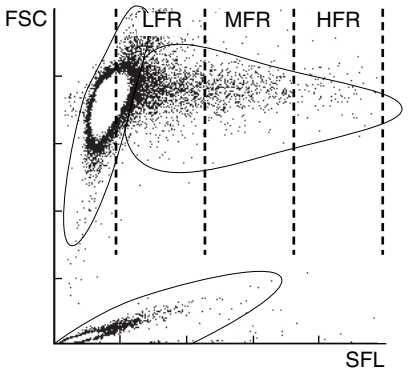
RET analysis

RET channel*

By flow cytometry method using a semiconductor laser, a two-dimensional scattergram is plotted, with the X-axis representing the intensity of the side fluorescent light (SFL), and the Y-axis representing the intensity of the forward scattered light (FSC).
This scattergram displays groups of reticulocytes, mature red blood cells and platelets.



The scattergram is divided into three RET zones based on the intensity of the fluorescent light, and the ratio of the reticulocytes in each zone to the total number of reticulocytes is calculated.



* Cannot be used depending on the analyzer type.

Reticulocyte Ratio:

$$RET\% = \frac{\text{Particle count in reticulocyte zone}}{\text{Particle count in mature RBC zone + Particle count in reticulocyte zone}} \times 100$$

Reticulocyte Count:

$$RET\# = \frac{RET\% \times RBC}{100}$$

Low Fluorescence Ratio:

LFR = 100 - HFR - MFR

Middle Fluorescence Ratio:

$$MFR = \frac{\text{Particle count in MFR zone}}{\text{Particle count in reticulocyte zone}} \times 100$$

High Fluorescence Ratio:

$$HFR = \frac{\text{Particle count in HFR zone}}{\text{Particle count in reticulocyte zone}} \times 100$$

Immature Reticulocyte Fraction:

IRF = MFR + HFR

LFR: Low Fluorescence Ratio
MFR: Middle Fluorescence Ratio
HFR: High Fluorescence Ratio
IRF: Immature Reticulocyte Fraction

RET-He (Reticulocyte Hemoglobin equivalent) :
The RET-He is a unique parameter developed by Sysmex that is derived using the reticulocyte scattered light signals and a proprietary Sysmex calculation equation.

15.4.3 Electrical system of the analyzer

The control unit in the analyzer controls solenoid valves and master valves in the hydraulic system, thus, it controls the flow of the sample, reagents, and waste fluid in the hydraulic system.
The electrical signals received from each detector are processed (waveform processing) in the analog unit, and sent to the control unit. In the control unit, the analog signals are converted to digital signals, and arithmetic processing is performed.

RBC and PLT cell signals are sent to the applicable waveform processing circuits of the analog unit, where noise is eliminated and the required blood cell signals are picked up. The microcomputer unit converts the analog-to-digital-converted cell signals into particle size distribution data and sends the data to the IPU.

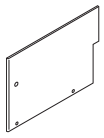
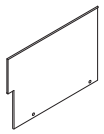
HGB is calculated by subtracting the light absorbance of the diluent (background count) from the light absorbance of the sample. As for this light absorbance, light that is passed through the liquid is received by the photodiode, where it is photoelectrically converted. It is then converted from analog to digital signals, and sent to the IPU.

The blood cell signals from the optical detector block (which analyzes WDF, WNR, WPC, PLT-F, and RET channel) can be obtained by sending signals from the forward scattered light, side scattered light, and side fluorescent light to the applicable waveform processing circuits of the analog unit, where noise is eliminated and the required blood cell signals are picked up. The control unit converts the analog-to-digital-converted cell signals into scattergram data and sends the data to the IPU.

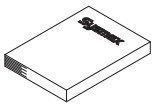
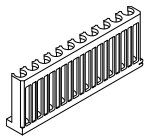
15.5 Unpacking checklist

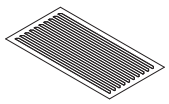
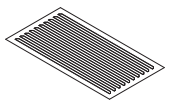
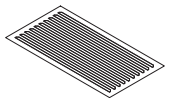
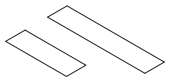
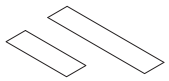
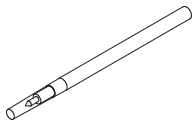
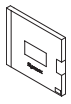
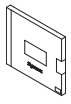
The accessories will vary depending on the configuration of your system. For more information, please contact your local dealer or Sysmex Representative.

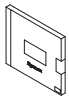
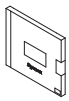
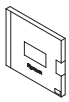
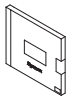
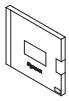
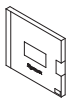
XN-9000 Panel supply parts

Part Number	Names		Quantity
CW904567	Panel No.196		1
AC174274	Panel No.210		1
348-4112-6	Washer built-in screw (sheet t1.0) M4 x 20		4

XN-9000 supply parts

Part Number	Names		Quantity
BV956490	XN-9000 Instructions for Use		1
CU800577	XN series Administrator's Guide		1
424-3332-1	Sample Rack No. 5-1 (White)		30
BR650149	Adapter No.208		300

Part Number	Names		Quantity
AF993398	Label No.783		2
BY155775	Label No.784		1
CK111407	Label No.785		1
CD625672	Label No.775		1
CN304506	Label No.776		1
462-3520-5	Transducer Brush		1
442-5343-6	Tube Polyurethane 10 mm x 14 mm 10 m		1
442-5340-5	Tube Polyurethane 6 mmID x 9 mmOD 3 m		1
AY734147	CDR_Assy No.69(1CT9X)		1
BT322173	CDR_Assy No.70(1ST0X)		1

Part Number	Names		Quantity
CN644508	CDR_Assy No.71(1ST1X)		1
AH894383	CDR_Assy No.72(1ST2X)		1
BA332434	CDR_Assy No.73(1BT4X)		1
CJ418932	CDR_Assy No.74(1CV5X)		1
BC473016	CDR_Assy No.75(1CV6X)		1
	XN series Software (1XN1X) * Make sure that the label "1XN1X" is affixed to the disk.		1
265-9561-4	S3IO Cable S3IO-L20		2
BT850247	Cap No.559		1
442-1657-0	PipeNo.27		1
AU272954	Plug No.109		40

Part Number	Names		Quantity
BG807462	Plug No.110		40
BV152143	Plug No.111		40

Analyzer (XN-20)

Part Number	Names	Quantity
CG049669	XN-20 Main Complete	1

Analyzer (XN-10)

Part Number	Names	Quantity
CN889554	XN-10 Main Complete	1

Pneumatic Unit (PU-17)

Part Number	Names	Quantity	
		100 - 117 V	220 - 240 V
013-3015-4	PU-17 Main Complete (100 - 117 V) (White)	1	-
013-3016-8	PU-17 Main Complete (220 - 240 V) (White)	-	1
923-8092-8	Power Cord No. 15	1	-
265-7153-5	Power Cord TA-6P(A)+TA-5(A) H05VV-F	-	1
266-5011-3	Fuse STA-4A-N1 (250V4A, Time Lag)	2	-
AY579418	Fuse 02183.15MXP (250V3.15A)	-	2

Barcode terminal (BT-40)

Part Number	Names	Quantity
461-8725-5	Warranty	1
461-8326-7	Product Inspection Certificate	1
BB525836	BT-40 Main Complete	1
265-9561-4	S3IO Cable S3IO-L20	1
BV354044	Fuse 50T040H	2
348-9502-9	Washer flat M4 (SUS)	2
348-9101-3	Washer square M6 (FE)	2
348-9514-3	Washer spring M4 (SUS)	2
348-9516-1	Washer spring M6 (SUS)	3
348-5020-4	Screw hex-socket bolt M4 x 12 (SUS)	2
348-5056-8	Screw hex-socket bolt M6 x 30 (SUS)	3

Start yard/Stock yard (ST-40/ST-41/ST-42)

Part Number	Names	Quantity		
		ST-40	ST-41	ST-42
461-8725-5	Warranty	1	1	1
461-8326-7	Product Inspection Certificate	1	1	1
BY714535	ST-40 Main Complete	1	-	-
AB694063	ST-41 Main Complete	-	1	-
CA895043	ST-42 Main Complete	-	-	1
CK259154	Mark No.183	1	-	-
CE060311	Mark No.182	1	1	1
265-9561-4	S3IO Cable S3IO-L20	1	1	1
AX880901	Fuse 50T032H	2	2	2
348-9502-9	Washer flat M4 (SUS)	2	2	2
348-9101-3	Washer square M6 (FE)	2	2	2
348-9514-3	Washer spring M4 (SUS)	2	2	2
348-9516-1	Washer spring M6 (SUS)	3	3	3
348-5020-4	Screw hex-socket bolt M4 x 12 (SUS)	2	2	2
348-5056-8	Screw hex-socket bolt M6 x 30 (SUS)	3	3	3

XN conveyor (CV-50)

Part Number	Names	Quantity
461-8725-5	Warranty	1
461-8326-7	Product Inspection Certificate	1
CQ618932	CV-50 Main Complete	1
266-7768-1	Fuse 50T100H	2
442-4486-8	Tube Joint PD-ML	1
CE525747	Fixture No.1102	1
AT805637	Fixture No.1032	1
CV675976	Support No.615	1
265-9561-4	S3IO Cable S3IO-L20	1
AX880901	Fuse 50T032H	2
348-9502-9	Washer flat M4 (SUS)	2
348-9101-3	Washer square M6 (FE)	2
348-9514-3	Washer spring M4 (SUS)	2
348-9516-1	Washer spring M6 (SUS)	3
348-5020-4	Screw hex-socket bolt M4 x 12 (SUS)	2
348-5056-8	Screw hex-socket bolt M6 x 30 (SUS)	3
348-4117-4	Washer built-in screw (sheet t1.3) M5 x 12	3
348-4119-1	Washer built-in screw (sheet t2.0) M5 x 20	2
348-5035-0	Hex Socket Bolt M5 x 10	1
348-4108-1	Washer built-in screw (sheet t0.8) M4 x 8	2
348-4113-0	Washer built-in screw (sheet t1.0) M4 x 25	2

SP conveyor (CV-60)

Part Number	Names	Quantity
461-8725-5	Warranty	1
461-8326-7	Product Inspection Certificate	1
CD898075	CV-60 Main Complete	1
265-9561-4	S3IO Cable S3IO-L20	1
AX880901	Fuse 50T032H	2
AT893185	Connecting Cord No. 23	1
348-9502-9	Washer flat M4 (SUS)	2
348-9101-3	Washer square M6 (FE)	2
348-9514-3	Washer spring M4 (SUS)	2
348-9516-1	Washer spring M6 (SUS)	7
348-5020-4	Screw hex-socket bolt M4 x 12 (SUS)	2
348-5056-8	Screw hex-socket bolt M6 x 30 (SUS)	3
348-5065-1	Screw hex-socket bolt M6 x 14 (SUS)	4
348-9102-7	Washer square M8 (FE)	4

Conveyor extension (CV-70)

Part Number	Names	Quantity
461-8725-5	Warranty	1
461-8326-7	Product Inspection Certificate	1
AH318517	CV-70 Main Complete	1
AX880901	Fuse 50T032H	2
AD125341	Connecting Cord No.24	1
BY035041	SL-M4300(L1500-W23) Belt	2
BJ909532	SL-M4300(L1700-W23) Belt	2
AE686228	SL-M4300(L1900-W23) Belt	2
CJ547726	SL-M4300(L2100-W23) Belt	2
266-6743-4	Clamp LWS-8S-2.5W	36
348-5020-4	Screw hex-socket bolt M4 x 12 (SUS)	2
348-5056-8	Screw hex-socket bolt M6 x 30 (SUS)	3
348-9502-9	Washer flat M4 (SUS)	2
348-9101-3	Washer square M6 (FE)	2
348-9514-3	Washer spring M4 (SUS)	2
348-9516-1	Washer spring M6 (SUS)	3
AX383926	Panel No.299	2
CG956446	Panel No.297	1
BJ785533	Panel No.298	1
348-4101-5	Washer built-in screw (sheet t0.5) M3 x 8	6
348-4110-9	Washer built-in screw (sheet t0.8) M4 x 12	2
AL962345	Panel No.301	1
AJ548082	Panel No.302	1
CG056242	Panel No.300	1

Turn unit (TU-40)

Part Number	Names	Quantity
461-8725-5	Warranty	1
461-8326-7	Product Inspection Certificate	1
CY061122	TU-40 Main Complete	1
AX383926	Panel No.299	2
CG956446	Panel No.297	1
BJ785533	Panel No.298	1
265-9561-4	S3IO Cable S3IO-L20	1
AX880901	Fuse 50T032H	2
348-9516-1	Washer spring M6 (SUS)	2
348-5056-8	Screw hex-socket bolt M6 x 30 (SUS)	2
348-4101-5	Washer built-in screw (sheet t0.5) M3 x 8	4
348-4110-9	Washer built-in screw (sheet t0.8) M4 x 12	2
266-6743-4	Clamp LWS-8S-2.5W	36

RR-10 Complete

Part Number	Names	Quantity
CY858505	RR-10 Main Complete	1
BM562710	Intake Tube_Assy No.27	1
CQ648980	Intake Tube_Assy No.28	1
BF869352	Wiring Cord No.6626	1
BF535201	Mount No.2854	1
AC650911	Mount No.2855	1
346-6564-4	Seal No.14	10
442-5338-7	Tube Polyurethane 4 mmID x 6 mmOD 1.4 m	1
442-5338-7	Tube Polyurethane 4 mmID x 6 mmOD 1.2 m	1
265-9561-4	S3IO Cable S3IO-L20	1
348-4108-1	Washer built-in screw (sheet t0.8) M4 x 8	8
348-4100-1	Washer built-in screw (sheet t0.5) M3 x 6	1
266-4461-8	Tie Wrap CV-100	20
266-6743-4	Clamp LWS-8S-2.5W	10

RR-10 Complete (W/O DCL)

Part Number	Names	Quantity
AG738647	RR-10 Main Complete (W/O DCL)	1
BM562710	Intake Tube_Assy No.27	1
CQ648980	Intake Tube_Assy No.28	1
BF869352	Wiring Cord No.6626	1
BF535201	Mount No.2854	1
AC650911	Mount No.2855	1
346-6564-4	Seal No.14	10
265-9561-4	S3IO Cable S3IO-L20	1
348-4108-1	Washer built-in screw (sheet t0.8) M4 x 8	8
348-4100-1	Washer built-in screw (sheet t0.5) M3 x 6	1
266-4461-8	Tie Wrap CV-100	20
266-6743-4	Clamp LWS-8S-2.5W	10

Dedicated wagon (WG-40)

Part Number	Names	Quantity
BP852798	WG-40 Main Complete	1
BM749930	Cover No.1908	1
348-4108-1	Washer built-in screw (sheet t0.8) M4 x 8	4
BK108192	Base No.472	3

Dedicated wagon (WG-50)

Part Number	Names	Quantity
AV008696	WG-50 Main Complete	1
BS672690	Cover No.1909	1
CF323946	Cover No.1912	1
AL219682	Mount No.2795	1
AK356939	Mount No.3027	2
BJ227363	Mount No.3802	1
BY233290	Mount No.3834	1
CR232780	Mount No.3835	1
AE149042	Mount No.3028	1
BM726902	Duct No.218	3
266-6744-8	Clamp LWS-5S-2W	10
266-6743-4	Clamp LWS-8S-2.5W	1
348-4100-1	Washer built-in screw (sheet t0.5) M3 x 6	4
348-4108-1	Washer built-in screw (sheet t0.8) M4 x 8	30
266-4462-1	Tie Wrap CV-250	10
BK108192	Base No.472	3

Dedicated wagon (WG-60)

Part Number	Names	Quantity
CN325779	WG-60 Main Complete	1
AH251590	Base_Assy No.28	1
BS672690	Cover No.1909	2
AT435986	Cover No.1910	1
CA604036	Cover No.1911	1
266-6743-4	Clamp LWS-8S-2.5W	10
348-4100-1	Washer built-in screw (sheet t0.5) M3 x 6	6
348-4108-1	Washer built-in screw (sheet t0.8) M4 x 8	8
BK108192	Base No.472	3

Dedicated wagon (WG-70)

Part Number	Names	Quantity
BT429413	WG-70 Main Complete	1
266-6743-4	Clamp LWS-8S-2.5W	12
BK108192	Base No.472	1

Dedicated wagon (WG-15)

Part Number	Names	Quantity
AV735844	WG-15 Main Complete	1
AQ299498	Panel No.222	1
BW193171	Mount No.2856	1
BJ008810	Mount No.3240	4
266-6744-8	Clamp LWS-5S-2W	4
348-5038-1	Screw hex-socket bolt M5 x 20 (SUS)	6
348-9505-0	Washer flat M5 (SUS)	6
348-9515-7	Washer spring M5 (SUS)	6
348-4108-1	Washer built-in screw (sheet t0.8) M4 x 8	12

External unit connector

Part Number	Names	Quantity
AC928158	Wiring Cord No.6672	1
BH638569	Wiring Cord No.6673	1
BJ310219	Connecting Cord No.32	2
266-4461-8	Tie Wrap CV-100	10
BL671327	Plate No.805	1
CJ137369	Connector No.171	1
CE021467	Connector No.172	1
BE323698	Connector No.174	1
BR883586	Connector No.176	1
AN999226	Connector No.175	2
AQ847048	Spacer DSB-345E	2
AC154481	Nut floating TL-360-4	8
BD767658	Spacer HD-LNA(05)	2
348-9001-8	Washer flat M2.6 (SUS)	4
348-9032-3	Washer spring M2.6 (SUS)	2
348-5065-1	Screw hex-socket bolt M6 x 14 (SUS)	12
348-9516-1	Washer spring M6 (SUS)	12
348-9101-3	Washer square M6 (FE)	8
348-3612-0	Screw flat M3 x 6 (SUS)	16
348-4109-4	Washer built-in screw (sheet t0.8) M4 x 10	10

Waste collecting tube (CW-10)

Part Number	Names	Quantity
AD861892	Disposal_Assy No.26	1
CK826217	Fixture No.1384	1
BQ337092	Fixture No.1385	1
AP148480	Support No.782	1
BS779958	TM-145SUS-35 Hose Band	1
CP716296	KBND25A	1
CF140497	TR-25 Hose 5 m	1
442-5340-5	Tube Polyurethane 6 mmID x 9 mmOD 70 mm	8
442-5338-7	Tube Polyurethane 4 mmID x 6 mmOD 50 mm	6
442-5338-7	Tube Polyurethane 4 mmID x 6 mmOD 350 mm	1
266-4461-8	Tie Wrap CV-100	2
348-4101-5	Washer built-in screw (sheet t0.5) M3 x 8	3
348-4108-1	Washer built-in screw (sheet t0.8) M4 x 8	4
348-4110-9	Washer built-in screw (sheet t0.8) M4 x 12	4
348-9502-9	Washer flat M4 (SUS)	2
348-8514-0	Nut hex M4 (SUS)	2

Rack barcode reader (RB-10)

Part Number	Names	Quantity
CB152299	Wiring Cord No.6538	1
AE134552	Holder_Assy No.129	1

Monitor Arm (DA-10)

Part Number	Names	Quantity
BN737861	Base No.441	1
CG452535	Base No.442	1
BN239478	Mount No.2699	1
348-4110-9	Washer built-in screw (sheet t0.8) M4 x 12	12
348-5056-8	Screw hex-socket bolt M6 x 30 (SUS)	4
348-9516-1	Washer spring M6 (SUS)	5
348-9101-3	Washer square M6 (FE)	5
348-5065-1	Screw hex-socket bolt M6 x 14 (SUS)	1
BK452426	DA-10 Main Complete	1

Display arm stand for CV-60

Part Number	Names	Quantity
CY558994	Support No.724	1
BN737861	Base No.441	1
CG452535	Base No.442	1
BJ768809	Cover No.2448	1
266-6743-4	Clamp LWS-8S-2.5W	2
348-4100-1	Washer built-in screw (sheet t0.5) M3 x 6	1
348-4110-9	Washer built-in screw (sheet t0.8) M4 x 12	8
348-3957-3	Screw binding M5 x 20 (SUS)	4
348-5065-1	Screw hex-socket bolt M6 x 14 (SUS)	5
348-9516-1	Washer spring M6 (SUS)	5
348-9515-7	Washer spring M5 (SUS)	4
348-9500-1	Washer flat M6 (SUS)	5

Display arm stand for ST

Part Number	Names	Quantity
CY558994	Support No.724	1
BD751411	Mount No.3836	1
BJ768809	Cover No.2448	1
266-6743-4	Clamp LWS-8S-2.5W	2
348-4100-1	Washer built-in screw (sheet t0.5) M3 x 6	1
348-3957-3	Screw binding M5 x 20 (SUS)	4
348-4111-2	Washer built-in screw (sheet t1.0) M4 x 16	8
348-5065-1	Screw hex-socket bolt M6 x 14 (SUS)	4
348-9516-1	Washer spring M6 (SUS)	4
348-9515-7	Washer spring M5 (SUS)	4
348-9500-1	Washer flat M6 (SUS)	4

Lyse branch tube-R WG complete

Part Number	Names	Quantity
CP101832	Intake Tube_Assy No.18	1
266-6744-8	Clamp LWS-5S-2W	2
348-4101-5	Washer built-in screw (sheet t0.5) M3 x 8	12

Lyse branch tube-3 WG complete

Part Number	Names	Quantity
BX947169	Connecting Tube_Assy No.19	1
BM597449	Intake Tube_Assy No.25	3
CW498650	Mount No.4106	1
266-6743-4	Clamp LWS-8S-2.5W	2
346-6564-4	Seal No.14	3
442-3564-8	Nipple No.62	5
348-4108-1	Washer built-in screw (sheet t0.8) M4 x 8	2

Lyse branch tube-1 WG complete

Part Number	Names	Quantity
CN131371	Connecting Tube_Assy No.20	1
BM597449	Intake Tube_Assy No.25	1
CW498650	Mount No.4106	1
266-6743-4	Clamp LWS-8S-2.5W	2
346-6564-4	Seal No.14	1
348-4108-1	Washer built-in screw (sheet t0.8) M4 x 8	2

DCL joint tube for wagon

Part Number	Names	Quantity
CF722523	Intake Tube_Assy No.19	1
AK369883	Intake Tube_Assy No.12	1
442-4003-7	Nipple No.123	1
442-5338-7	Tube Polyurethane 4 mmID x 6 mmOD 2.4 m	3
266-4461-8	Tie Wrap CV-100	1
348-4100-1	Washer built-in screw (sheet t0.5) M3 x 6	3
348-4101-5	Washer built-in screw (sheet t0.5) M3 x 8	4

PU joint tube for wagon

Part Number	Names	Quantity
AQ818765	Connecting Tube_Assy No.18	1
BC368688	Guide No.1102	1
AW563572	Label No.556	4
AY040549	Fixture No.1367	1
BD482546	F2920X-00(25X25)-Black 1.6 m	1
362-9582-4	Knob THA-189 No.3929	1
348-4116-1	Washer built-in screw (sheet t1.3) M5 x 10	2
CQ891968	Wiring Cord No.6939	1

SP joint tube for wagon

Part Number	Names	Quantity
AR024643	Intake Tube_Assy No.17	1
348-4101-5	Washer built-in screw (sheet t0.5) M3 x 8	3

RU joint tube for wagon

Part Number	Names	Quantity
AE78414/CH571224	Intake Tube_Assy No.20/Intake Tube_Assy No.20 (RU-20(2))	1
BL435748	Holder_Assy No.154	1
AF147365	Panel No.166	1
348-4100-1	Washer built-in screw (sheet t0.5) M3 x 6	9
348-4101-5	Washer built-in screw (sheet t0.5) M3 x 8	4
348-4108-1	Washer built-in screw (sheet t0.8) M4 x 8	4
442-4003-7	Nipple No.123	1
442-5338-7	Tube Polyurethane 4 mmID x 6 mmOD 2.4 m	3
442-1403-8	Connecting tube No.3	2
CQ891968	Wiring Cord No.6939	1
266-4461-8	Tie Wrap CV-100	12

RU External Storage Kit

Part Number	Names	Quantity
BD542368	Cover No.2805	1
CG257545	Cover No.2806	1
AH550332	Mount No.4741	2
BR324397	Mount No.4742	1
BK133456	Mount No.4743	1
BK108192	Base No.472	3
348-5068-2	Screw hex-socket bolt M6 x 30 (SUS)	3
348-9516-1	Washer spring M6 (SUS)	3
348-4101-5	Washer built-in screw (sheet t0.5) M3 x 8	4
348-4108-1	Washer built-in screw (sheet t0.8) M4 x 8	16
348-4110-9	Washer built-in screw (sheet t0.8) M4 x 12	4
AR783607	Wiring Cord No.7285	1
CR911154	Wiring Cord No.7286	1
422-5340-5	Tube Polyurethane 6 mmID x 9 mmOD 5.8 m	3
442-5338-7	Tube Polyurethane 4 mmID x 6 mmOD 50 mm	3
442-4002-3	Nipple No.122	6
442-5338-7	Tube Polyurethane 4 mmID x 6 mmOD 1 m	3
442-5338-7	Tube Polyurethane 4 mmID x 6 mmOD 10 m	2

Indicator light (SI-10)

Part Number	Names	Quantity
BD142736	SYT-101-S1-000+X	1
241-9218-7	Ferrite Clamp ESD-SR-250	1
266-4461-8	Tie Wrap CV-100	1

Indicator light (SI-11)

Part Number	Names	Quantity
AP576509	SYT-101-S1-800+X	1
BG327022	Mount No.4354	1
CW135768	Mount No.4355	2
CQ318472	Cover No.2627	1
BD597485	Mount No.4356	1
348-4100-1	Washer built-in screw (sheet t0.5) M3 x 6	2
348-4101-5	Washer built-in screw (sheet t0.5) M3 x 8	9
348-8513-6	Nut hex M3 (SUS)	2
348-9513-0	Washer spring M3 (SUS)	2
241-9218-7	Ferrite Clamp ESD-SR-250	1

Indicator light (SI-13)

Part Number	Names	Quantity
AR322904	Display_Assy No.1(BF-SU)	1
CW135768	Mount No.4355	2
AN534546	Mount No.5040	1
AW302120	Cover No.2917	1
CS583794	Mount No.5043	1
AM525175	Cover No.2918	1
266-6744-8	Clamp LWS-5S-2W	1
CM316026	Connecting Cord No.67	1
CH849330	Label No.1142	2
348-4100-1	Washer built-in screw (sheet t0.5) M3 x 6	2
348-4101-5	Washer built-in screw (sheet t0.5) M3 x 8	8
348-8513-6	Nut hex M3 (SUS)	2
348-9513-0	Washer spring M3 (SUS)	2

Indicator light (Lamp_Assy No.7)

Part Number	Names	Quantity
BG768468	Lamp_Assy No.7	1
BM080457	Connecting Cord No.11	1
AL722968	Label No.418	1

Power Code (SE type)*

Part Number	Names	Quantity
265-7153-5	Power Cord TA-6P(A)+TA-5(A) H05VV-F	1

* for Europe, Asia-Pacific

Power Code (Bf type)*

Part Number	Names	Quantity
265-4733-2	Power Cord No.7687	1

* for United Kingdom, Australia

15.6 Installation

15.6.1 Cautions on installation

The instrument and associated equipment is installed by your Sysmex technical representative. In case relocation becomes necessary after installation, contact your Sysmex technical representative.
Problems resulting from moving of the equipment by anyone other than a Sysmex technical representative are not covered by the Warranty even within the warranty period.

15.6.2 Grounding

The instrument power supply cord uses a 3-prong plug. When the power supply socket is provided with grounding, simply plug it to the socket. If the socket does not provide grounding, use an adapter to ground the power supply safely.

⚠ Warning!

- Be sure to ground this instrument.
  Improper grounding may cause electrical shock.
- Be sure not to exceed socket capacity.
  Failure to do so may cause a fire.

⚠ Caution!

Use the power cord that comes with the instrument. Also, do not use it with any other instrument.

15.6.3 Installation environment

- Use the instrument in an ambient temperature within the range of 15 to 30°C.
- Relative humidity should be within the range of 30 to 85%.
- If ambient temperature and relative humidity are not within the suggested range, air-condition the environment.
- Avoid places of extremely high or low temperatures.
- Avoid a place that is exposed to direct sunlight.
- Choose a well ventilated place.
- Avoid places with wireless communication devices or other equipment that can generate high frequency waves, as radio interferences can occur.

15.6.4 Installation space

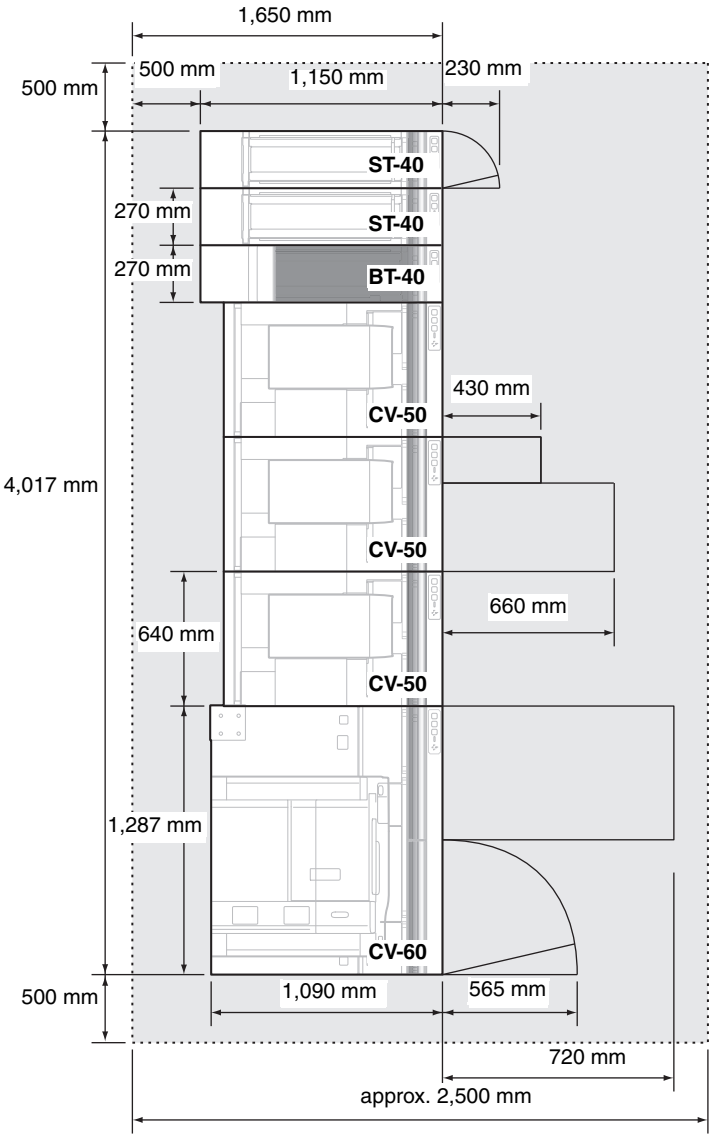
To secure the space required for maintenance, install the IPU on the right side of the analyzer.
Secure a distance of at least 30 cm behind the device.

15.6.5 Installation space (transportation unit)

The following space is required to install the transportation unit.
The transportation unit and the total length of the line varies with the system configuration.

Item name	Width (mm)	Depth (mm)	Height (mm)	Weight (kg)	Power consumption (VA)
Start yard/Stock yard (ST-40/41/42)	270	1,150	908*1	approx. 31	120
Barcode terminal (BT-40)	270	1,150	981*1	approx. 36	150
XN conveyor (CV-50)	640	957	1,543*2	approx. 42	120
SP conveyor (CV-60)	1,277	380	1,283*3	approx. 50	120
Conveyor extension (CV-70)	650	258	909	approx. 48	120
Turn unit (TU-40)	400	400	811	approx. 36	120

*1 Including the dedicated wagon.
*2 Including the analyzer and dedicated wagon.
*3 Including the SP-10 and dedicated wagon.

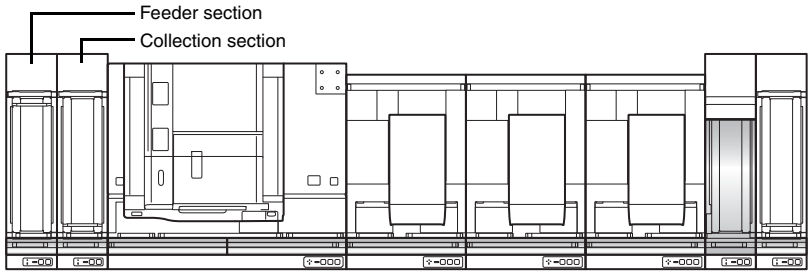


15.6.6 Examples of transportation system configuration

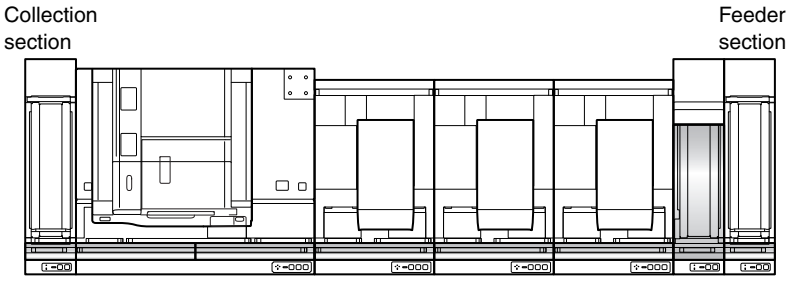
The system consists of multiple transportation units, and devices can be added or changed.
For the basic configuration of the transportation system, refer to Chapter 1.
(➤**P.1-4** "Chapter 1: 1.2.3 Transportation system configuration")
In addition to the basic configuration, other configurations are also possible to work with your environment.

Examples of combinations other than the basic configuration

e.g. 1. A configuration with the feeder and collection sections on the left side



e.g. 2. A configuration with the feeder section on the right side and the collection section on the left side.



15.7 Warranty

All Sysmex instruments are warranted against defective material or workmanship for a period of one year, commencing on date of installation at the customer's premises. This warranty does not however cover any defect, malfunction or damage due to:

- Accident, neglect or willful mistreatment of the product.
- Failure to use, operate, service or maintain the product in accordance with the applicable Sysmex Instruction for Use.
- Failure to use the appropriate reagents and supply parts specified for the product.

Information

If the customer moves the instrument or operates it at a different location, the warranty expires. Contact your Sysmex technical representative before moving.

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Version 2, June 1991

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