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| **IMM 1.7 Maintenance Procedures for the ELx800 Automated Microplate Reader** | | | | | | | |
| **Purpose** | This procedure provides instructions for performing maintenance procedures on the ELx800 Automated Microplate Reader. | | | | | | |
| **Policy Statements** | * This procedure applies to all laboratory technologists who operate the ELx800 Automated Microplate Reader, and to the section supervisor. | | | | | | |
| **Materials** | **Supplies** | | | | **Equipment** | | |
|  | * Distilled water * Lint free disposable towels * 70% Isopropyl Alcohol * Dish Soap or other mild cleaner * Tween 20® (RELISA wash buffer concentrate) * yellow food coloring | | | | **•** N/A | | |
| **Procedure** | Follow the activities in the table below for **PERFORMING ELx800 DAY OF USE MAINTENANCE.** | | | | | | |
|  | 1 | **System Test;**  The System Test checks for light levels and electronic noise at all wavelengths that fall within factory acceptance criteria. This is done by measuring the air and dark readings, and evaluating them to ensure they fall into specific ranges. The reader automatically runs an internal System Test each time it is powered on. An error will be displayed if the test fails. No printout will occur at the power on System Test. To obtain a printout of the System Test values for either periodic testing and documentation or troubleshooting press SOFT KEY 1 from the Tests sub menu.  When SOFT KEY 1 is pressed, the Automated Microplate Reader runs the instrument’s System Test, and reports results in a pass/fail format.  **Checksum Test;**  This test also runs automatically when the reader is powered on. The test compares the software to the internally recorded checksum values to ensure that the programming has not been corrupted. If there are any errors during the power on Checksum Test they will be displayed. To verify the Checksum, revisions and versions of software currently loaded onto the reader, press SOFT KEY 2 from the Tests submenu. | | | | | Section 4-6 of the Operators Guide. |
|  |  | Follow the activities in the table below for **PERFORMING ELx800 MONTHLY MAINTENANCE.** | | | | |  |
|  | 1 | **Calibration Test Plate;**  The Universal Test Plate will test the accuracy, alignment and repeatability of the reader.  If any of the test parameters report as “FAIL” confirm that the standard values on the test plate certificate match the values on the printout. If not, correct and retest. If the test still fails, contact Bio-Tek’s Technical Assistance center at 1-800-242-4685. Have a copy of the test, and the reader’s serial number when you call. | | | | | Section 4-6 to 4-11 of the Operators Guide. |
|  |  | Follow the activities in the table below for **PERFORMING ELx800 ANNUAL MAINTENANCE.** | | | | |  |
|  | 1 | **Liquid Test 1:**  Liquid testing tests the reader in ways that the Calibration Test Plate cannot. The test plate will indicate the absolute amount of light absorbed which will accurately test the linearity of the electronics. The liquid test will help detect optical defects such as dirt or contamination which can contribute to errant readings.  1. Create a 0.5% solution of Tween 20 and deionized water. As an example, add 50ul of Tween 20 to 200ml of deionized water. Shake well for several minutes.  2. Add 7 drops of yellow food coloring to the 200ml of the 0.5% Tween solution. This should give an absorbance of 0.7-1.4 absorbance units when using 200ul in the well. If the absorbance is too high, less well volume or less food coloring may be used.  3. Stir well to ensure all the color is spread throughout the solution. This is the stock solution.  4. Using freshly prepared stock solution prepare a 1:2 dilution using DI water (one part stock, one part DI water).  5. Pipette 200 μL of the ***concentrated*** stock solution into each well in the top half of the microplate (A1 through D12).  6. Pipette 200 μL of the ***diluted*** solution into each well of the lower half of the plate (E1 through H12).  7. Read the microplate three times at 405 nm, single wavelength.   1. As of 5/19/20 program 59 has been designated for Liquid Test.   8. Data will automatically print after each read.  ***Repeatability Specification:***  For comparison in this test, the following repeatability specification is applied, using the Normal Read Mode and a 96-well microplate.  ± 0.5% ± 0.005 OD @ 405 nm.  ***Calculations:***  *See G: Immunology Lab > ELx50 - ELx800 > Liquid Test for an Excel spreadsheet formatted to perform these calculations.*  1. Calculate the mean for each well for the three readings.  2. For each mean calculate the allowed range using the repeatability specification of ± 0.5% ± 0.005 OD.    For example: Absorbance readings of 0.800, 0.802, and 0.799 will result in a mean of 0.8003. The mean (0.8003) multiplied by 0.5% (0.8003 \* 0.005) = 0.004, and 0.004 + 0.005 = 0.009 OD. This gives an allowable range of 0.791 to 0.809 (± 0.005). | | | | | Section 4-12 to 4-14 of the Operators Guide. |
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| **References** | 1. BIO-TEK ELx800 Automated Microplate Reader Operators Guide,   Copyright © 1995, BIO-TEK Instruments, Inc. | | | | | | |
| **Historical Record** | **Version** | | **Written/Revised by:** | **Effective Date:** | | **Summary of Revisions** | |
| 1 | | Al Quigley | 10/01/19 | | Initial Version | |
| 2 | | Amanda McCaustland | 5/26/20 | | Removed residual volume test, clarified liquid test procedure | |
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