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SUBJECT

**Best 2000 – Absorbance Reader –
Verification Plate Utility Software**



Attached to this letter you will find a technical bulletin regarding the Absorbance Module. The Best 2000 manufacturer, Dynex Technologies, has developed the Verification Plate Utility Software which easily allows us the verification process of the Best 2000 Absorbance Module when using the Opsy MR Verification Plate.

The part number you will require is:

3410-0493	Opsy Verification Plate (405 / 450 / 490 / 550 / 590 / 620)	24098
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We extremely recommend reading carefully the instructions and restart the PC after software installation and before using it.

Contact our Technical Service Department to obtain the required software.

Please, do not hesitate to contact us if you need further details.




DSX Verification Plate Utility

Software Instruction Manual

IMPORTANT

Please read carefully before using the Verification Plate

Rev 7-7-03



This manual is published by DYNEX Technologies, Inc.

Questions or comments regarding the content of this manual can be directed to the address below or to your DYNEX Technologies representative.

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DYNEX Technologies reserves the right to make technical improvements to this equipment and documentation without prior notice as part of a continuous program of product development. This manual supersedes all previous editions.

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Introduction

The Verification Plate Utility allows for automating the verification process of the DSX Absorbance Module (AM) when using the Opsys MR Verification Plate. The Verification system provides the following performance testing for 405, 450, 490, 550, 620, and 630 nm wavelengths in the DSX AM:

- Alignment
- Accuracy
- Linearity
- Precision

Verification Plate Utility Instructions

These instructions are intended to assist the user run and evaluate the data using the Opsys MR Verification Plate, and the DSX Verification Plate Utility program. This program will test Alignment, Accuracy, Precision and Linearity. These instructions assume that the user is familiar with Windows and that the Revelation DSX program is not running.

Installation and Start Up

1. Install the Utility program on the same PC that is running the Revelation DSX program.
2. Follow the on screen prompt until completely installed.
3. Ensure that the Revelation Program is not running at the time you execute the Verification Plate Utility.

Utility

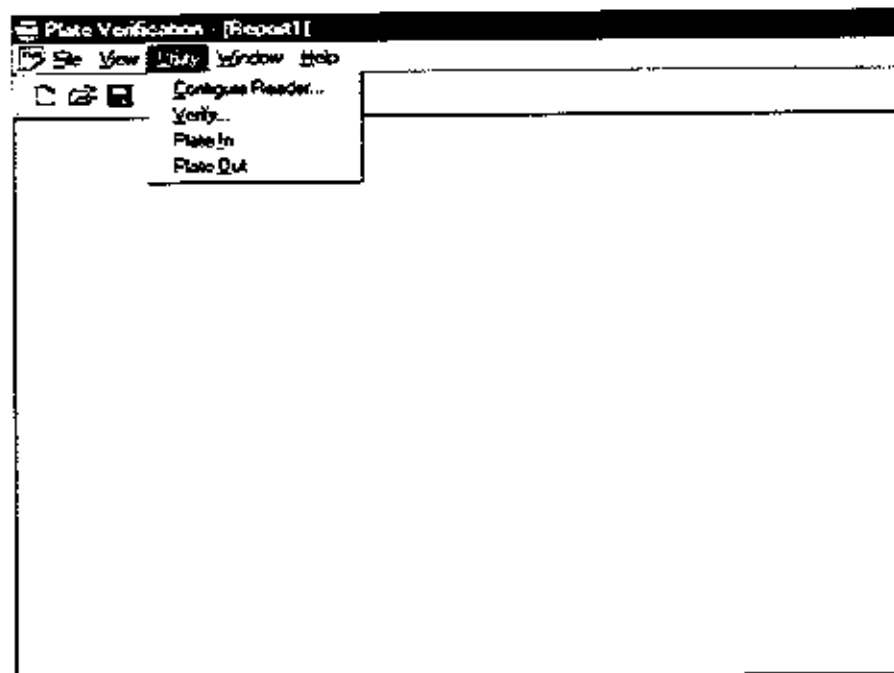


Figure 1 Utility Menu

Configure Reader

This allows you to change the COM settings in order to communicate with the DSX.

Verify

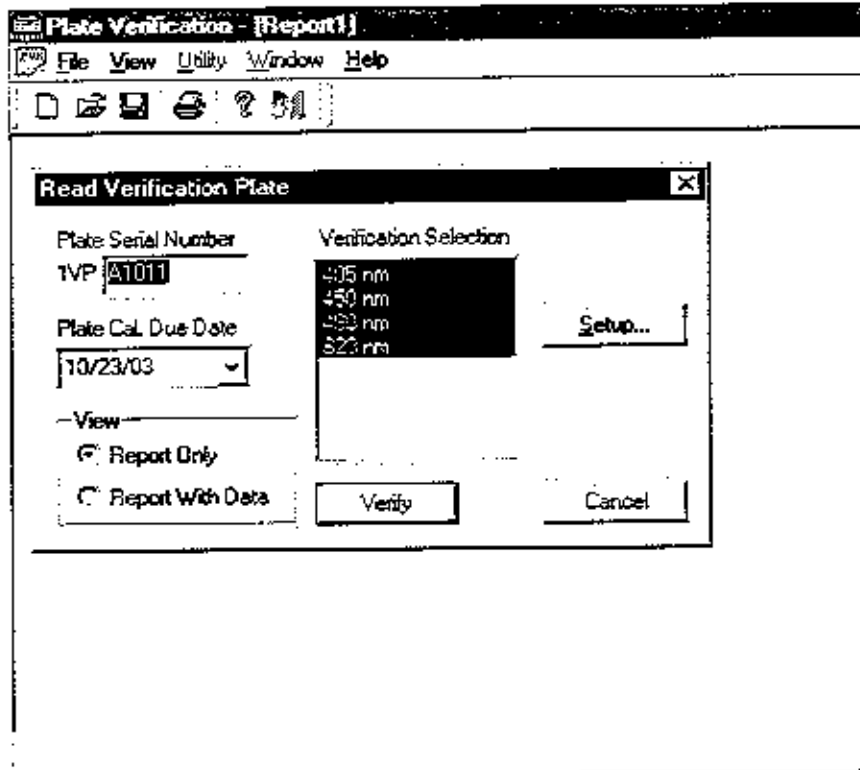


Figure 2, Verify

- ❖ *Plate Serial Number:* enter the remaining 5 digits of the OpsysMR Verification Plate serial number.
- ❖ *Plate Cal. Due Date:* enter the calibration due date for your plate from the certificate of calibration.
- ❖ *View:*
 - **Report Only:** this provides a Pass/Fail report for the specific wavelengths run for all four tests performed by the plate. See Figure 3

Verification Report
 Number Serial # 4020000000000000 Plate Serial # 1000000000000000
 Date 07/08/2002 Date 08/22/02 Operator 1000000000000000
 Verification Results for wavelength: 488 nm
 Alignment: Pass
 Accuracy: Pass
 Linearity: Pass
 Precision: Pass
 Room Temperature: _____ WATERY _____
 Operator (plate carrier): _____
 Operator signature _____ Date _____

Figure 3, Report Only

- **Report with Data:** This is the Pass/Fail report with the data used to make that determination.
- ❖ **Verification Selection:** This lists the wavelengths installed in the DSX AM. This is also where you select which wavelengths you want to verify.
- ❖ **Set up:** Using the calibration information from your certificate, enter this information into the appropriate section for each wavelength. *See Figure 4*
- ❖ **Verify:** This ejects the AM plate carrier so you can insert a plate holder and Verification Plate.

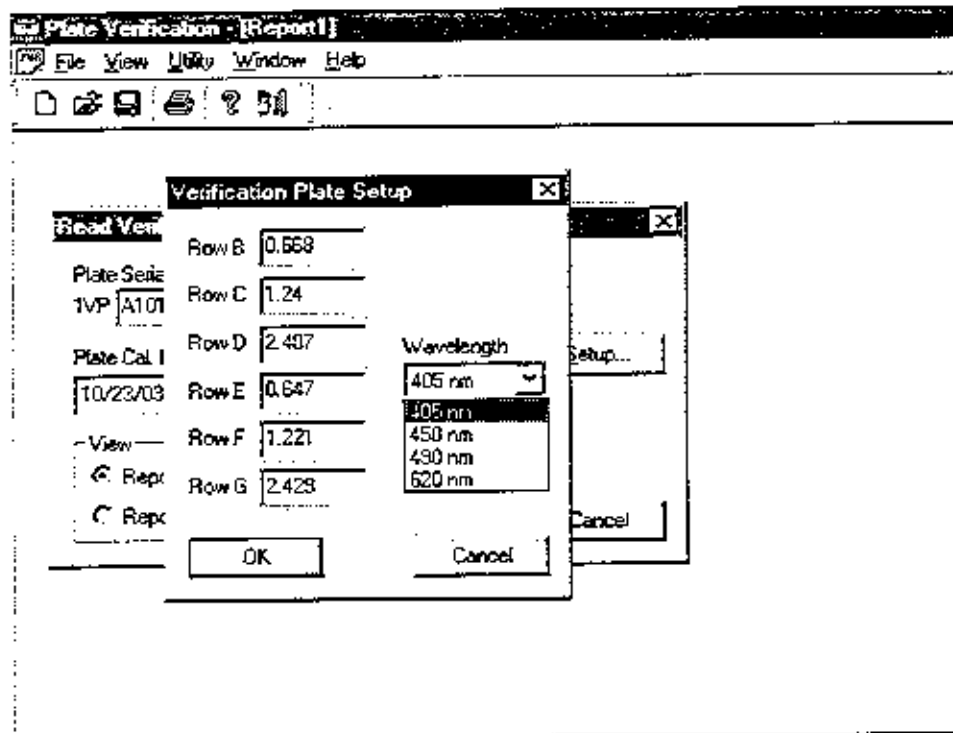


Figure 4, Verification Plate Set-up

Running the Plate

To verify the DSX AM using the OpsysMR Verification Plate, do the following:

- 1) Ensure the Revelation DSX program is closed.
- 2) Open the Plate Verification Utility program.
- 3) Select Utility from the menu bar and choose Verify. The Read Verification Plate dialog box will appear (See *Figure 2*).
- 4) If using for the first time (if not go to step 4):
 - a) Enter the serial number of the plate, the calibration due date of the plate and choose the desired report.
 - b) Enter the set-up values for each row and wavelength you have installed.
- 5) Choose the wavelengths you wish to verify. In the Verification Selection box (*figure 2*) highlight (mouse click or ctrl-click for multiple wavelength selections) on the wavelength (s) you wish to verify.

-
- 6) Click Verify.
 - 7) Once the system has finished and given you a report, select the Plate Out command from the Utility menu and remove the plate.
 - 8) Print and sign the reports.

Certificate of Calibration

We suggest that you make a copy of this document for your records. It is a good practice to keep the original certificate with the plate at all times. The convenient and protective storage case will aid you in this task.

Interpreting Results

The accuracy and linearity of the DSX AM is specified in the product literature, which you can obtain from the operators manual or by contacting DYNEX Technologies. For your convenience, we have provided simple illustrative examples of how the specified criteria are applied to the performance of the Absorbance Module.

If any of the performance tests indicate a failure then the unit is NOT operating according to specifications. In such an instance, refer to the trouble-shooting guide at the end of this Manual. If the failure persists then you should contact DYNEX Technologies immediately for service.

Alignment

The alignment procedure compares the ratio of average intensities of certain wells against empirically determined alignment constants to ensure that the optics and associated mechanical systems are physically aligned. If a machine fails the Alignment test then all other performance test results become invalid.

Accuracy

The average of 10 reads per well is compared to the accuracy criteria for each filter well on the plate. All wells must pass the accuracy criteria for the accuracy test to PASS.

Criteria: $\pm .010$ OD or 2.5% (whichever is greater)

Example:

Consecutive well B3 readings:

(.521,.523,.519,.512,.514,.511,.510,.516,.521,.517)

Well average equals .516

Standard Certified Value for row B is .515

$1.025 \times .515 = .528$ greater than .516

$.975 \times .515 = .502$ less than .516

Q.E.D well B3 passes accuracy criteria

Linearity

Six points are used to generate a least squares curve fit. The r^2 value is calculated for the curve fit. The r^2 value must be greater than or equal to 0.9900 for the linearity test to PASS.

One point is generated per row of filter wells on the plate. The certified value for a row is used as the abscissa, and the mean of the 10 read well averages of the same row is used as the ordinate value to define the point.

Example:

Certified standard value for rows (.515, 1.102, 2.153, .517, 1.072, 2.161)

Row averages (.516, 1.123, 2.145, .517, 1.075, 2.163)

$y = .9965x + .0076$ least squares linear curve fit

$r^2 = .9998$ greater than .9900

QED Linearity test passed

Precision

The Coefficient of Variation (CV) for each filter well on the plate after reading the plate 10 times must pass the Precision Criteria for the plate to PASS the precision verification. The Coefficient of Variation for a given well is defined as

$CV = 100 \times \text{Standard Deviation (10 well reads)} / \text{Well Average.}$

Criteria: $\pm .010$ OD below .500 OD
< 1% CV between .500 OD and 2.000 OD
< 1.5% CV between 2.100 OD and 3.000 OD

Example:

Consecutive well B3 readings:
(.521,.523,.519,.512,.514,.511,.510,.516,.521,.517)
Well average equals .516
Well standard deviation equals .004575
CV equals $100 \times .516 / .004575 = .886\%$ less than 1.000%
QED well B3 passes the precision criteria

Trouble-Shooting

- A unit can be verified at one or more filter wavelengths. The verification plate must be calibrated/characterized at the wavelength of interest and the appropriate filter must also be installed and registered correctly in the unit for valid results.
- If the ALIGNMENT test fails then insure that the plate is installed flat and in the correct orientation in the plate carrier. It may be necessary to perform standard maintenance on the plate to ensure that row A and H holes are unobstructed and the plate glass is clean. If the Alignment test continues to fail, contact DYNEX Technologies.
- If any verification test fails, first review and perform all standard maintenance procedures, which are suggested in the Verification Plate and Maintenance portion of the Opsys MR User Manual. If the failures persist, contact DYNEX Technologies for further service.