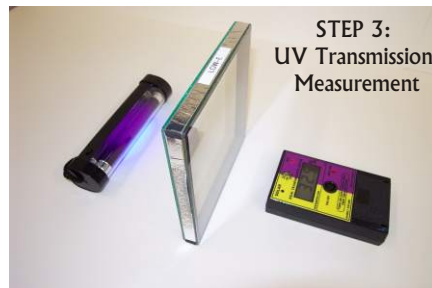


## UV TRANSMISSION

The procedure for UV Transmission measurements are extremely similar to that of solar transmission measurements. Obviously a UV light source is necessary to conduct UV measurements. Using a Heat Lamp for UV measurements is not allowed, as there is not sufficient UV energy provided from an infrared heat lamp. If you attempt to use a heat lamp or other light source that does not have sufficient UV energy, the display of the XM1400 meter will lock up with the words "LO" printed on the display. You must turn the meter off, find a sufficient source of UV energy and turn the meter back on. Please note that if you are using a qualified UV lamp source and the display locks up with the "LO" indication, move the UV lamp closer to the meter and restart your test.

Most UV lamps require 1 minute to warm up when they are first turned on. Because of this, if you calibrate your XM1400 to a UV lamp immediately upon turning the lamp on, the output of the lamp will continue to increase during the first 60 seconds of being turned on. Therefore your calibration of the XM1400 for that measurement will not be as accurate. You will know that the UV lamp is increasing in energy, because your display will begin reading a value GREATER THAN 100% (For example 103%). If this occurs, allow the lamp to warm up for an additional 60 seconds and start the entire measurement process again.

- 1) Place the meter on a stationary platform or tabletop surface with the sensor (top end of meter) facing the UV Lamp (EDTM Model# UV1390). The lamp and meter MUST both be in a STATIONARY position.
- 2) Turn on the UV Lamp first and let it warm up for approximately 60 seconds. Now turn on the XM1400 meter. The meter will turn on in SOLAR Mode. After the meter turns on, press the RED Toggle Button (labeled as "SELECTOR"). This will switch the meter into UV Mode and the meter will immediately perform a self-calibration for the current UV energy conditions. The display will read 100 (= 100% transmission). Your meter is now prepared to take a UV Transmission measurement with the current UV Lamp conditions. Please proceed to STEP 3. If the surrounding conditions change, or you accidentally move the meter OR lamp, repeat STEP 2. You will know if your conditions changed by the number on the display. With the meter facing only the light source, it should always read 100%. If the letters "LO" appear on the display, this means there is not sufficient UV energy to conduct a measurement. Turn the meter off, correct the problem and begin at Step 1 again. The "LO" condition will occur if you turn the meter on before the light source.
- 3) Now place the glass or film sample you are demonstrating between the meter and the UV Lamp. The resulting UV Transmission % for the sample will be displayed. For the best accuracy, make sure the frame of your window sample is not blocking the sensor of the meter. The sensor should have a clear view of the UV lamp through the glass or film. This may require you to place the meter on a platform (or box) that lifts it off the tabletop surface.
- 4) To confirm your reading, remove the glass or film sample and the meter should return to 100%. If the meter does not display 100, it is possible that your light conditions have changed or your meter and lamp might have moved during your measurement. You may choose to perform the measurement a second time.



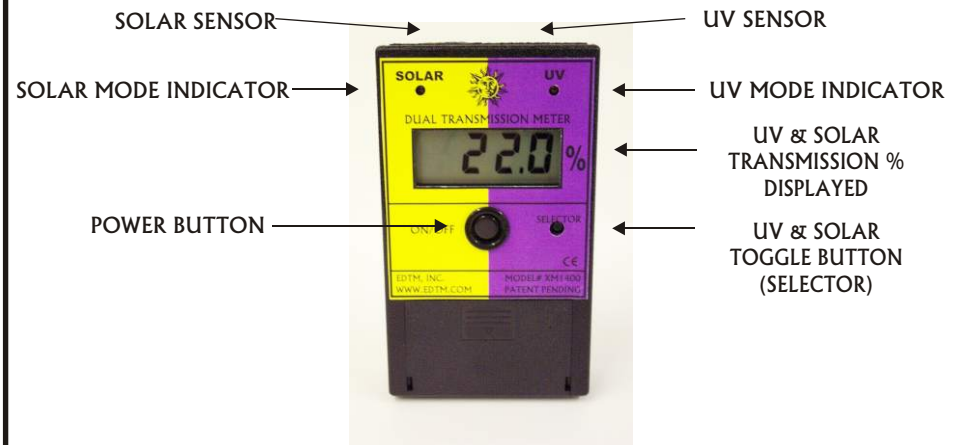
# DUAL TRANSMISSION METER

## UV & SOLAR Transmission

MODEL #XM1400

### GENERAL DESCRIPTION:

The digital Dual Transmission Meter combines two of our most popular performance tools into one meter. Evaluate and demonstrate the UV and Solar Transmission performance of your product with this simple, yet sophisticated instrument. The XM1400 is able to calculate the actual Solar Transmission percentage associated with a given material, helping to illustrate how well your product rejects (or transmits) solar energy. In the UV mode, the XM1400 will show how well your product protects from damaging UV rays. This meter is great for working with glass, film, plastics, coatings, laminates or other materials.



### FEATURES:

- UV & SOLAR TRANSMISSION MEASUREMENTS
- CONVINCING DEMONSTRATIONS
- SIMPLE OPERATION
- SHARP-CUT UV BAND FILTERS FOR ACCURATE UV MEASUREMENT
- REAL-TIME READINGS CONTINUALLY UPDATED
- END-MOUNTED SENSORS
- CONVENIENT PUSH-ON/PUSH-OFF POWER SWITCH
- SMALL, PORTABLE CONVENIENT SIZE

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LOW-E DETECTORS, 4 POINT SHEET RESISTANCE METERS, TIN SIDE DETECTORS  
SELF-CLEAN COATING DETECTORS, INSPECTION EQUIPMENT

## BASIC OPERATION

The XM1400 Meter has two sensors at the top end of the meter. These sensors should be directly facing the sun or your artificial light source during your measurements. Although the XM1400 has dual sensors, there is only one display to show the measurements. Therefore the meter will test only one of the two bands (UV or solar) at a time. For the solar spectrum, our XM1400 will cover 300 to 1200 nm. This includes the UV-A, visible light and near infrared spectrums. When the meter is toggled into UV Mode, the UV sensor is designed to measure the UV-A spectrum only (approximately 320nm to 390nm).

## SOLAR MODE

When the XM1400 meter is initially turned on, it is in Solar Mode. As the meter turns on it is performing a calibration for the solar spectrum. Therefore you should have your light source (or sun) in a fixed position in regard to the meter. The meter will self-calibrate itself and show 100% on the display. If there is not a sufficient amount of solar energy to conduct a valid measurement, the display will lock with the word "LO" appearing in the display. If this occurs, you must turn the meter off and reposition the meter closer to a solar energy source and restart the meter. We recommend using EDTM's Model# HL1040 Infrared Heat Lamp Assembly as your artificial solar energy source.

## UV MODE

After the meter has been turned on, the user can switch the meter into UV Mode to conduct UV transmission measurements. The user should position the XM1400 meter so it is facing the UV source. After the meter has been fixed in a location facing the UV source, simply hit the toggle button (labeled as "SELECTOR") to switch the meter into UV mode. When the meter toggles into UV mode, it will self-calibrate and show 100% UV energy. You are now ready to test your materials for UV transmission. Once again, if there is not sufficient UV energy available, the display will lock with the word "LO" appearing. You must turn the meter off and reposition the meter closer to the UV source, then start your measurement again. The most suitable UV source for conducting tests is EDTM's Model# UV1390.

## TOGGLE BUTTON

Each time the toggle button is pushed, the meter will switch from one mode to the other (Solar <---> UV). The LED indicators at the top of the meter will confirm which mode you are in. Each time the meter is switched into a new mode, the meter is performing a NEW self-calibration for the current light conditions. Therefore the meter should be directly facing the light source you are testing with, prior to pushing the toggle button. After you hit the toggle button, the meter should register 100%. If it shows any number other than 100%, you should perform a new calibration by toggling the meter out of the current mode and back again.

## BATTERY REPLACEMENT <==> BLINKING DISPLAY

The XM1400 is powered by a 9 volt alkaline battery. When the battery voltage is getting too low to operate the meter, the display will begin blinking. Once the numbers on the display begin blinking you will want to replace the battery soon. To replace the battery, turn off the meter. Remove the battery cover near the bottom of the meter and replace with a new battery. Alkaline batteries will provide the longest service, but are not required for this product.

## TABLETOP SALES PRESENTATIONS

The XM1400 can be used to perform dynamic TABLETOP PRESENTATIONS, illustrating how well your product blocks the solar and UV energy of the sun. The next section of the manual will explain how to perform Solar & UV Transmission demonstrations. You will need a solar or infrared light source for the solar transmission demonstration, similar to EDTM's Model# HL1040 Infrared Heat Lamp. For conducting UV Transmission measurements, we recommend using EDTM's Model #UV1390 UV Demonstration Lamp.

## SOLAR TRANSMISSION

- 1) Place the meter on a stationary platform or tabletop surface with the sensor (top end of meter) facing the Heat Lamp (Model# HL1040). The lamp and meter MUST both be in a STATIONARY position.
- 2) Turn on the Heat Lamp first, and then turn on the XM1400 meter. The meter will turn on in SOLAR Mode and perform a self-calibration. The display will read 100 (= 100% transmission). Your meter is now prepared to take a Solar Transmission measurement with the current Heat Lamp conditions. Proceed to Step 3. If the surrounding conditions change, or you accidentally move the meter OR lamp, repeat STEP 2. You will know if your conditions changed by the number on the display. With the meter facing only the light source, it should always read 100%. If the letters "LO" appear on the display, this means there is not sufficient solar energy to conduct a measurement. Turn the meter off, correct the problem and begin at Step 1 again. The "LO" condition will occur if you turn the meter on before the light source.
- 3) Now place the glass or film sample you are demonstrating between the meter and the Heat Lamp. The resulting Solar Transmission % for the sample will be displayed. For the best accuracy, make sure the frame of your window sample is not blocking the sensor of the meter. The sensor should have a clear view of the heat lamp through the glass or film. This may require you to place the meter on a platform (or box) that lifts it off the tabletop surface.
- 4) To confirm your reading, remove the glass or film sample and confirm that the meter returns to 100%. If the meter does not display 100, it is possible that your light conditions have changed or your meter and lamp might have moved during your measurement. You may choose to perform the measurement a second time.



Model #HL1040  
Infrared Heat Lamp

STEPS 1 & 2:  
Self-calibrating the meter  
for Solar Transmission



STEP 3:  
Solar Transmission  
Measurement shown with  
Low E coated glass sample

## MEASURING INSTALLED WINDOWS

It can be difficult to measure installed windows. The best results are obtained when the meter is testing windows inside of a building that are directly facing the sun. It is also easiest to test operable windows (windows that can be opened and closed). The position of the meter is EXTREMELY important in obtaining an accurate reading. The meter should be placed on the window sill on top of its box or other stationary item that will hold the meter in the same position. Be sure the meters "view" will not be impeded by the frame of the window. The sensors must be able to "see" through the glass only (not the frame).

### SOLAR TRANSMISSION

**1)** Completely open the window that is being tested. Make sure the window is NOT blocking any of the light from the sun. This requires that the sun is DIRECTLY facing the building side that contains your window to be tested. Place the meter on the window sill in a fixed horizontal position with the sensor (top end of meter) facing directly outward (perpendicular to the window surface). The meter MUST stay in a STATIONARY position throughout the measurement.

**2)** Turn on the XM1400 meter and it will turn on in SOLAR Mode and perform a self-calibration. The display will read 100 (= 100% transmission). Your meter is now prepared to take a Solar Transmission measurement with the current light conditions. Proceed to Step 3. If the light conditions change, or you accidentally move the meter, turn the meter off and repeat STEP 2. Please note that if clouds move in front of the sun during your calibration, or at any time during your measurement, it will certainly affect the calibration. You will know if your conditions changed by the number on the display. With the meter facing through the open window, the display should always read 100%. If the letters "LO" appear on the display, this means there is not sufficient solar energy to conduct a measurement.

**3)** Now close the window without moving the meter. The resulting Solar Transmission % for the window will be displayed. For the best accuracy, make sure the frame of your window sample is not blocking the sensor of the meter. The sensor should have a clear "view" of the sun through the glass or film.

**4)** To confirm your reading, open the window and check that the meter returns to 100%. If the meter does not display 100, it is possible that your light conditions have changed or your meter moved during your measurement. It is recommended that you perform several measurements to confirm you obtained a valid reading.

### UV TRANSMISSION

For UV Transmission measurements, follow the same procedure described above. The only difference is that you must switch the meter into UV Mode by pressing the "SELECTOR" switch. Remember that your meter must be in position facing the open window before pressing the SELECTOR switch. The XM1400 meter will conduct a self-calibration for the existing UV conditions as soon as the SELECTOR button is pushed.

### FIXED WINDOWS (NOT OPERABLE)

Fixed windows that cannot be opened and closed are much more difficult to test. Since the window cannot be opened, you must calibrate the meter to the outside conditions by walking to the outside and holding the meter on the exterior surface facing horizontally (perpendicular to the window surface), with the sensor facing outward (away from the window). When you turn the meter on, it will perform a self-calibration to the exterior conditions. Now you must walk to the inside of the building and hold the meter in the exact same position facing outward. The resulting transmission percentage will be displayed. Obviously this test procedure is open to a large number of errors. Changing light conditions (i.e. clouds passing in front of the sun, etc.) can greatly affect your measurements. Also the angle that you hold the meter both outdoors and indoors must be identical. We do not recommend using this test method if you are in need of HIGHLY ACCURATE measurements. This procedure will however provide you with some general test results as to the performance of a given window.

## HELPFUL OPERATING TIPS

1. When taking measurements, it is important that the meter is held in the exact same position throughout the measurement. Any change in angle or proximity to your UV or solar source can adversely affect the accuracy of your measurements. FOR BEST RESULTS, place the meter and UV/solar source on a stationary platform. When conducting measurements, slide the glass or film sample between the meter and the UV/solar source, without moving the position of the meter. This will guarantee the most accurate readings possible.

2. It is advised to take multiple readings to reduce the amount of error that can occur. Be aware that a changing light source (sun with moving clouds) will affect your transmission readings.

3. The UV and solar sensors are located at the top end of the enclosure. For the greatest accuracy in measurements, this sensor should be directly facing the UV/solar source. DO NOT alter the condition of the sensor opening by touching or pushing on the filter. Any modifications or altering of the exterior surface of the filter WILL affect the calibration of the meter. This area should be kept clean at all times. Compressed air or a lint-free cloth should be used to clean the filter surface if it becomes soiled.

4. Do not attempt to open the enclosure. Opening the enclosure will void the product warranty and affect the calibration of the meter.

5. If you are conducting tests with a Heat Lamp, please be sure that you do not leave the meter setting in front of the Heat Lamp for extended periods of time. Heat Lamps (250 Watt) generate an extremely large amount of heat that is capable of melting the enclosure of the XM1400 or damaging the sensors and filters inside the meter. If the sensor end of the enclosure feels hot to the touch, you should move the meter away from the lamp, allowing it to cool, or simply turn the lamp off for a period of time. Melting of the XM1400 enclosure or damage to the sensors and filters inside due to excess heat exposure is not covered under the standard warranty terms for this meter.

## XM1400 WARRANTY

The manufacturer warrants all models of the XM1400 to be free from defects in material and workmanship under normal use and service as specified within the operator's manual. The manufacturer shall repair or replace the unit within twelve (12) months from the original date of shipment after the unit is returned to the manufacturers factory, prepaid by the user, and the unit is disclosed to the manufacturers satisfaction, to be thus defective. This warranty shall not apply to any unit that has been repaired or altered other than by the manufacturer. The aforementioned provisions do not extend the original warranty period of the unit which has been repaired or replaced by the manufacturer. Batteries are not covered by warranty.

EDTM, Inc. assumes no liability for the consequential damages of any kind through the use or misuse of the XM1400 product by the purchaser or others. No other obligations or liabilities are expressed or implied. All damage or liability claims will be limited to an amount equal to the sale price of the XM1400, as established by EDTM, Inc.