ILT400 and ILT490
Operators Manual

International**Light**

TECHNOLOGIES

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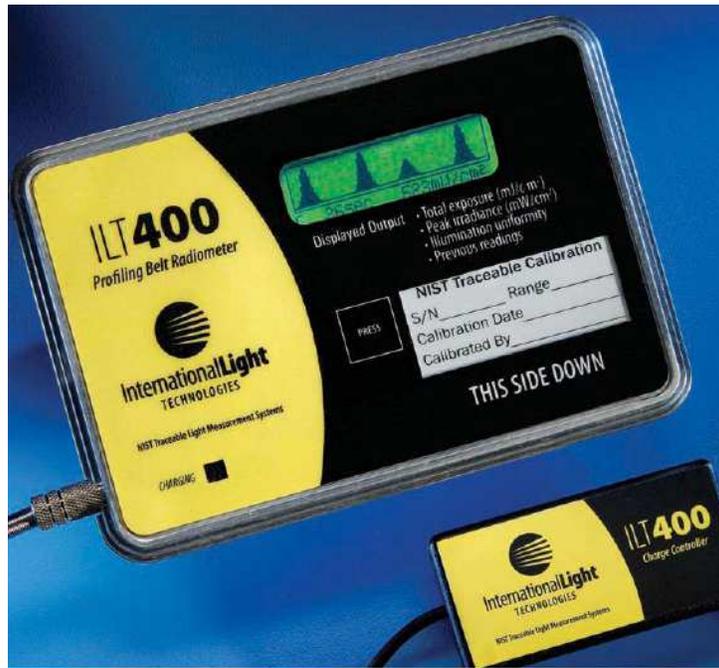
Check Package Contents

Your new ILT400 or ILT490 belt radiometer system includes:

- Belt Radiometer
- A400 charger, or uni-charger
- CC400 Carrying case
- NIST traceable calibration certificate
- Operators manual

Introduction

Congratulations on your purchase of the International Light Technologies **ILT400/ILT490** Profiling Belt Radiometer. The **ILT Belt radiometer** was the world's first one-button, real-time diagnostic tool for assuring proper exposure in your curing processes and optimum operation of your conveyorized curing chamber .The **ILT400/ILT490** is extremely rugged and easy to operate. With proper care and annual calibration service this meter will give you many years of dependable, accurate service.

WARNING: PLACING THE ILT400/ILT490 FACING INCORRECTLY (WITH LABEL SIDE UP) WILL CAUSE SEVER DAMAGE.
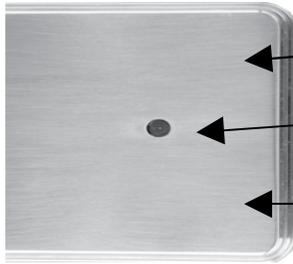
THIS SIDE TOWARDS LAMP

KEEP SENSOR CLEAN

Keep the metal side clean and shiny to help prevent overheating which can cause a reduction in readings.

Battery Test: (software version 3.30 and higher) **When you first turn on the unit, the system will automatically test the battery. If the battery is low, a warning to charge the battery before using will appear and then shut off the unit if the system needs to be re-charged.** See recharging instructions on page 6.

1. TAKING DATA (DATA ACQUISITION MODE):

If the screen is blank, press the on/control button, marked "PRESS" **once**. The unit will turn on and will display screen 1 to the right (It will turn off automatically in 5 minutes if it is not run through the curing chamber)

SCREEN ONE

0 J/cm^2

0 mW/cm^2
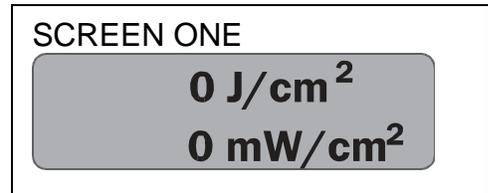
Place the meter **LABEL SIDE DOWN** on the conveyor. When it emerges from the chamber the display will alternate every 5 seconds between numeric and graphical displays similar to screens 2 and 3 to the right.

SCREEN TWO

1.83 J/cm^2

199 mW/cm^2
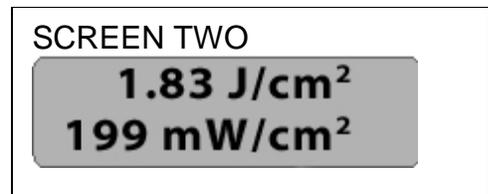
To stop the display from alternating, press "PRESS" **once**. Press it once again to start the display alternating again. The **ILT400/ILT490** will shut itself off automatically after five minutes. To shut it off immediately press "PRESS" **two times** quickly.

SCREEN THREE

126 Sec   199.5 mW/cm²
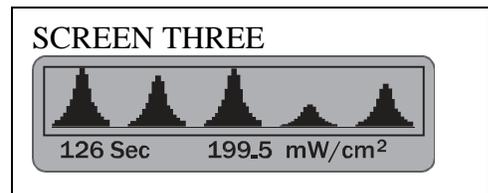
The current profile may be stored for future analysis in the data acquisition mode by pressing the "PRESS' button **three times** rapidly.. Please read the following section 2. for more information on creating a baseline or chapter 3. for using analysis mode.

2. CREATING A BASELINE

You cannot use the data analysis mode until you store a baseline. If you attempt to perform analysis prior to saving a baseline, you will see an error message "no baseline profile stored". To create a baseline, Follow step 1 above to obtain a reading, and then press the "PRESS' button **three times** rapidly. This will save the current profile permanently as a baseline. "PRESS' button **two times** to shut meter off.

To change the saved baseline, simply take a new reading following step 1. Press the "PRESS' button **three times** while a current profile is displayed. This will replace the existing baseline permanently

Note: We recommend updating your baseline whenever you install new lamps, clean or re-align reflectors, or perform maintenance.

3. ACCESSING DATA ANALYSIS/SYSTEM DIAGNOSIS MODE:

The meter provides a visual display of the status of your lamps and reflectors and allows you to compare the current reading to your stored base line. The meter will hold one baseline profile and one current reading profile in memory, that can be visually compared in analysis mode.

To enter analysis mode the meter must be turned off and the screen blank. **"PRESS"** the button **twice** when the unit is **off** to turn the meter on in data analysis mode. If you have just completed step 1. Taking Data, **"PRESS"** the button **two times** quickly to turn the unit off then **"PRESS"** the button **two times** again to turn the meter on in data analysis mode.

NOTE: Each time the **"PRESS"** button is pressed **one time** to turn the unit on, the current reading is replaced. If you do not take a new measurement and attempt to use analysis mode an error message, **"no profile captured"** will be displayed. You will need to follow step 1. and take a new current reading, Press the **"PRESS"** button **twice** to turn the meter off and **"PRESS"** button **twice** again to return to analysis mode.

FEATURES AND OPTIONS IN DATA ANALYSIS MODE:

Analysis mode opens with the current profile displayed as shown below on the left. To change the display, press the "PRESS" button **one time** which will toggle through current, baseline and difference screens. "PRESS" button twice to exit and shutdown.

The current profile is identified by the letter "C" in the lower left corner of the display. The amount of seconds (126) is shown in the middle and the peak irradiance value 271 mW/cm2 is shown on the right.
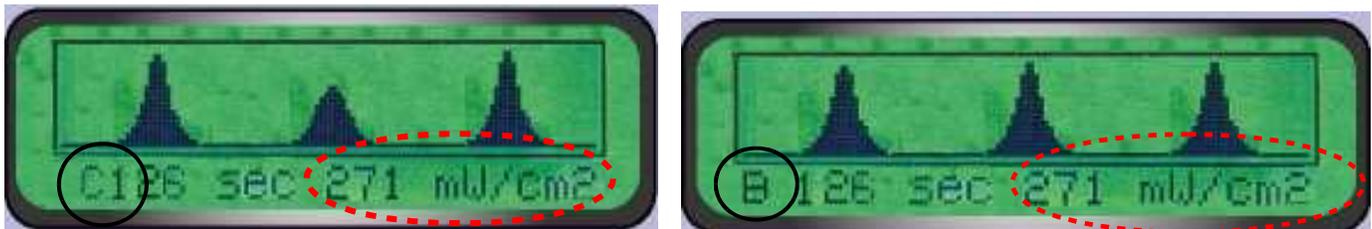
The base line profile (above on the right)is identified by the letter "B" in the lower Left corner of the display. In this example you can compare the baseline profile, to the current profile and see that the peak irradiance has not change, (both read 271 mW/cm^2). Though the peak is the same, it is clear that lamp number two has decreased in intensity as the height of the profile of lamp 2 is about half that of the lamps 1 and 3, indicating it has lost power. The run time of 126 sec is noted to the left of the peak irradiance. The run time information is provided for process comparison. When different belt speeds or different exposure times are used the shapes of the peaks and valleys may appear different (broader or narrower) and this information can be useful in understanding changes in shape.

The difference screen shows the percentage difference in the irradiance profiles. The "7D" in the lower right corner of the screen shows that there were 7 days between the base line and current run. An "M" or "H" would indicate minutes or hours between measurements. The display shows both decreases and increases in performance. In this case, the upside down peaks indicate that the only change is lamp two which is currently weaker than it was when the base line was taken. The ±32% indicates that the maximum (full scale) difference is 32%. The accuracy of the difference display is graphically limited to 5%.

Quick Review: Real-Time System Diagnostics

The **baseline profile** shows all three Lamps having a uniform output of **271mW/cm^2**

The current run shows that the middle lamp's output has diminished

C indicates current run

Bad Lamp

D indicates difference display

% maximum irradiance difference between current and baseline irradiance profiles
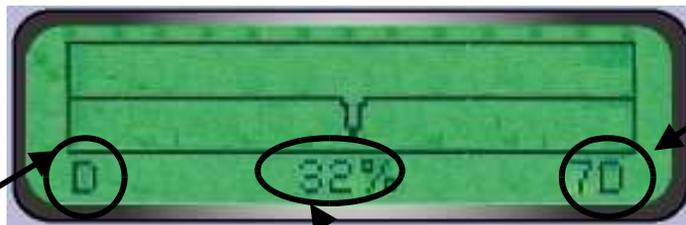
There were **7 days** between the baseline measurement and the current measurement

SYSTEM ANALYSIS FOR MAINTANANCE

The irradiance profile display can be a powerful diagnostic for determining the type of maintenance that is required. In the diagram to the right we have provided some examples for interpreting the information provided by the display. Peaks 1 and 3 represent well focused normal output lamps. Peak 2 is lower and wider. This indicates that lamp 2 is probably out of focus or that the reflector is very dirty. Peak 4 is lower but not wider. This indicates that lamp 4 is loosing power, but is well focused. Peak 5 has a double hump. This can indicate that either the reflector is severely defocused or that it is warped or delaminated. The lamp may also be weak.

<center>1   2   3   4   5</center>

C 126 Sec   199 mW/cm^2
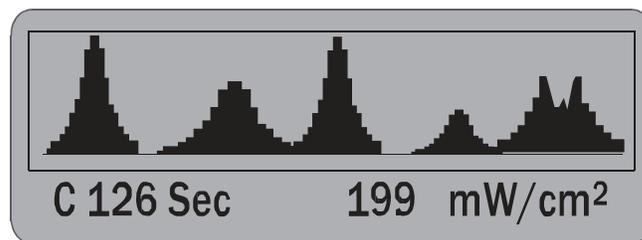
To exit analysis mode simply press the "PRESS" button twice quickly at any time.

ILT400 Maintenance

The ILT400 is a very rugged instrument and should not require any maintenance other than cleaning the exposed surface. *Note: It is important to keep the exposed surface shiny and clean and to <u>avoid contaminating the input optic</u> located in the round aperture on the exposed side.* We recommend lens cleaners, a soft cloth and/or a Q-tip using care to prevent scratching the housing and optic. Over time the bandpass filters and integrating sphere in the meter may begin to degrade due to the extreme UV exposure. This gradual degradation manifests itself in changes in total transmission and bandpass characteristics, both of which adversely affect the calibration. It is, in part, for this reason that the meter should be re-calibrated on an annual basis. In some cases, with extreme use (irradiance, frequency, or temperature) shorter calibration cycles are required.

ANNUAL RECALIBRATION AND REPAIR

The recalibration procedure includes evaluation of the charging system and batteries, evaluation of the internal optics (sensor, filter and integrating sphere), and a complete optical and electrical calibration traceable to N.I.S.T. And is ISO17025 accredited. Calibration and repair service is available by obtaining an RMA (returned materials authorization) number on our website: https://www.intl-lighttech.com/rma and shipping goods to 10 Technology Dr. Peabody MA 01960 attn RMA #_____. or your local rep. outside of USA. Customer Service may be reached at:

<div align="center">

Email: ilservice@intl-lighttech.com

Tel: 978-818-6180 x 2

Fax: 978-818-6181

</div>

Battery Recharging:
(NOTE: Older models (LEFT) use 1 LED, Newer models RIGHT use 2 LED's)
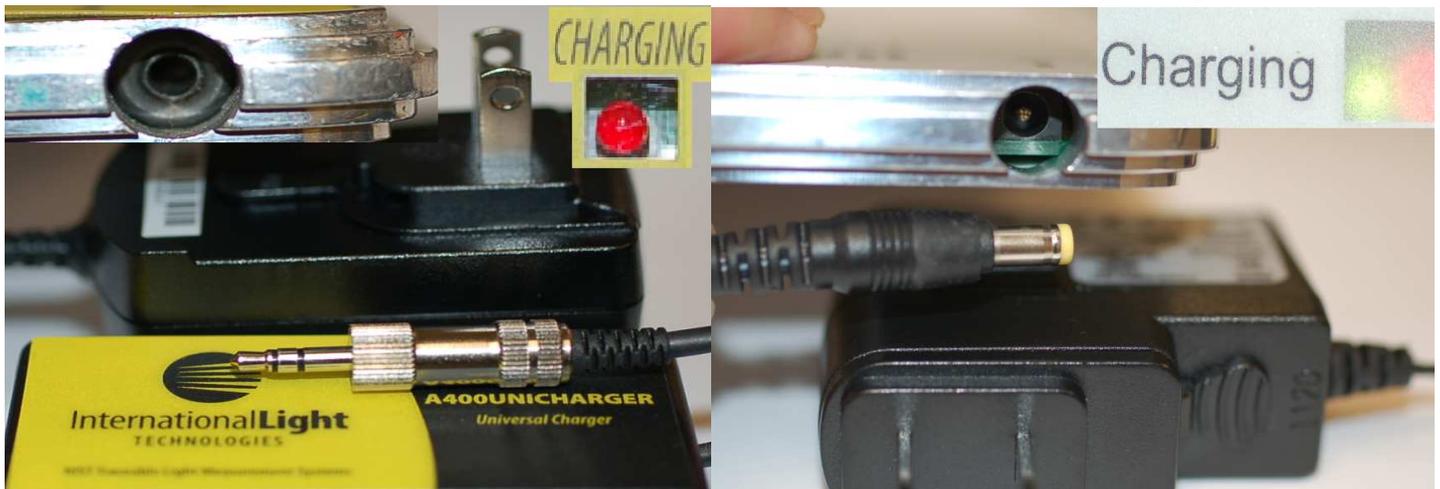
On the lower left side of the meter is a female receptacle used for charging the five internal rechargeable batteries. Different version meters have different charging units as you can see in the photo above. Older models use the A400unicharger or A400charger, which has a solid metal post and the inside of the receptacle is a black surface with a empty hole in the center. Newer units have a yellow tipped post and the inside of the receptacle is green board with a pin in the center of the hole. When the correct charger is plugged into an AC outlet and connected to the meter and begins charging, the RED LED will light to indicate the system is charging. When the RED LED turns off the system is fully charged. On newer Units the Green LED will always remain on when proper plug connection is made. It is the RED led that indicates charging is ongoing in both versions. You can expect about 3 to 5 hours of continuous operation when fully charged. Older model chargers should be unplugged from meter body when not being charged to prevent battery drain. *Always allow the unit to fully charge and for the RED LED to shut off before use.*

Rev C   6

WARNING: Do not plug A400charger USA charger into 220/230 V supply
Universal charges are available for use outside of USA which includes three plug adapters: type A US 110V 2 prong, type G UK 230 V 3 prong, and type C Europe 230 V two prong.)

Warning: In some models the batteries will drain if the charger is left plugged into the meter when not connected to power. After use, we recommend keeping unit plugged in to power in charge mode. This will assure unit is ready when needed. If not being charged, be sure to unplug charger from unit.

Software

The most current software is version is 3.30 updated July of 2007. The 3.30 software can handle belt speeds of 1 to 80 fpm, and irradiance values from 1mW/cm^2 up to 20 W/cm^2. Version 3.30 software begins data capture when 10 mW/cm^2 is measured and can profile once an irradiance value of 20 mW/cm^2 is measured. Once an irradiance of 20 mW/cm^2 is measured, the system will continue to measure until less than 20 mW/cm^2 is measured for 5 consecutive seconds. Once the 5 seconds threshold is met, the measurement is complete, and the system will automatically begin toggling between the numerical and graphical display modes.

Warranty and Liability

This ILT product is warranted against defects in material and workmanship for a period of one year from the date of shipment. During the warranty period, ILT will, without charge, repair or replace, at its discretion, the defective product or component parts. For warranty service or repair, this product must be returned to International Light Technologies. For products returned under warranty, the Buyer shall prepay shipping charges (including shipping charges, duties, and taxes for products returned to ILT from another country), and ILT will pay for shipping charges to return the product to the Buyer. This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations, modifications or repairs, if the serial number is altered, defaced or removed, the improper or inadequate maintenance by the Buyer, Buyer-supplied software or interfacing, or improper site preparation or maintenance. No other warranty is expressed or implied. ILT shall not be liable for any consequential damages, including without limitation, damages resulting from loss of use, as permitted by law.

NOTE: Removal of the label from the ILT400 voids warranty.

TROUBLE SHOOTING GUIDE:
1. DISPLAY TURNS BLACK: This is an indication that the meter is being overheated. Assure the meter is cool prior to insertion in the oven, assure shiny surface is clean to allow maximum reflectance of heat, shorten time in the oven and/or increase the distance from the lamp.

2. RED CHARGING LIGHT DOES NOT TURN ON WHEN I PLUG IN THE CHARGER. If the charging plug is not inserted completely, the LED may not light. Remove the plug and reinsert fully into the charge jack. If the ILT400 is fully charged, the LED will not light.

3. MY METERS ARE NOT READING THE SAME. First be sure you are comparing two of the same models. ILT meters come in different spectral versions. Two ILT UVA meters should read within the stated tolerance on the calibration certificate, but may not read the same as a meter from another manufacturer or as our UVB meter. You can compare spectral and spatial response of the two meters which in most cases will explain the variation in readings. If you are comparing two ILT meters measuring the same spectrum, both in calibration they should read within the tolerance noted. If it has been over 6 months since they have been calibrated, it could be that the usage level requires a shorter cal cycle than you have implemented, or it could be an indication that there is a problem. Please contact our service dept with the model and serial number and a short sample of readings taken.

4. MY SYSTEM READS NO PROFILE CAPTURED. If this is the first time you are operating the unit, you must take a new reading to allow the system to capture a profile. After the first profile is taken, it remains until it is overwritten by a new profile.

QUICK GUIDE

DATA ACQUISITION MODE

"PRESS"   Start data collection

"PRESS"   Start/stop display cycling

"PRESS"
"PRESS"   Store a baseline
"PRESS"

"PRESS"
"PRESS"   Shut down

DATA ANALYSIS/SYSTEM DIAGNOSIS

"PRESS"
"PRESS"   Shut down (MUST START WITH SYSTEM OFF)

"PRESS"
"PRESS"   Start analysis mode

"PRESS"   Move between screens

"PRESS"
"PRESS"   Store a baseline
"PRESS"

"PRESS"   Shut down
"PRESS"

Long Term Performance Tracking

Date	Max. Irradiance	Comments