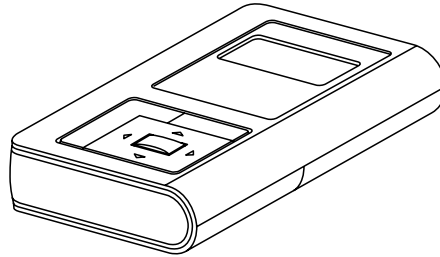


Catalog Numbers • Les Numéros de Catalogue • Los Números de Catálogo: LMCT-100-2

Country of Origin: Made in China • Pays d'origine: Fabriqué en Chine • País de origen: Hecho en China
LMCT-100-2-U is BAA and TAA compliant (Product produced in the U.S.)



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USING THE LMCT-100-2

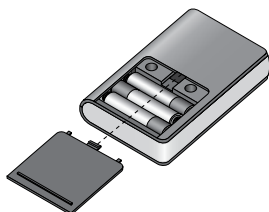
The LMCT-100-2 Digital Configuration Tool is a hand-held tool for setup and testing of Wattstopper Digital Lighting Management (DLM) devices. It provides wireless access to occupancy and daylighting sensors for setup and parameter changes, Wattstopper Push n' Learn™ (PnL) technology for load configuration, switch and dimmer assignment and operating parameter changes. The LMCT-100's display shows menus and prompts to lead you through each process. The navigation pad provides a familiar way to navigate through the customization fields. The LMCT-100-2 allows modification of the system without requiring ladders or tools and can be done simply with a touch of a few buttons.

The LMCT-100-2's IR transceiver allows bidirectional communication between DLM devices and the LMCT-100. Simple menu screens let you see the current status of the system and make changes. It can change any of the DLM occupancy sensor parameters such as sensitivity, time delay and more. With the LMCT-100-2 you can also change load configurations, without any new wiring. The LMCT-100-2 can change dimming system options such as scene assignments, fade rates and other options not available through the standard user interface. Additionally, the LMCT-100-2 can be used for initial configuration of the LMLS-400, LMLS-500, and LMLS-600 daylight sensors.

BATTERIES

The LMCT-100-2 operates on three standard 1.5V AAA Alkaline batteries or three rechargeable AAA NiMH batteries.

The battery status displays in the upper right corner of the display. Three bars next to BAT= indicates a full battery charge. A warning appears on the display when the battery level falls below a minimum acceptable level. To conserve battery power, the LMCT-100-2 automatically shuts off 10 minutes after the last key press.



NAVIGATION

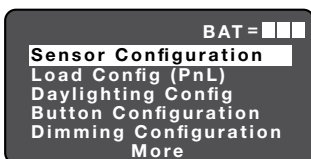
You navigate from one field to another using ▲ (up) or ▼ (down) arrow keys. The active field is indicated by flashing (alternates between yellow text on black background and black text on yellow background).

Once active, use the Select button to move to a menu or function within the active field.

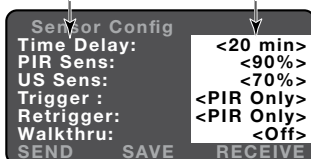
Value fields are used to adjust parameter settings. They are shown in "less-than/greater-than" symbols: <value>. Once active, change them using ◀ (left) and ▶ (right) arrow keys. The ◀ left key decrements and the ▶ right key increments a value. Selections wrap-around if you continue to press the key beyond maximum or minimum values. Moving away from the value field (using ▲/▼ keys) overwrites the original value.

NOTE: When the bottom line of the screen contains commands (such as SEND, SAVE, RECEIVE, etc.), both the left/right and up/down buttons will move between the commands.

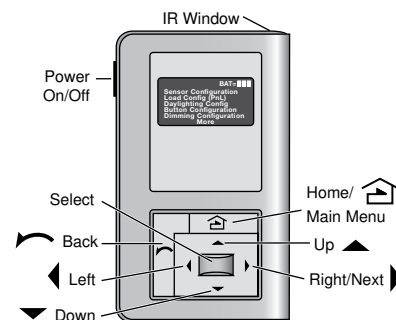
Function Fields (on Home Menu)



Parameters Value Fields



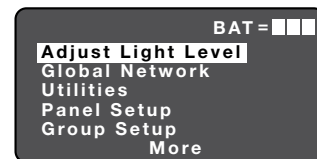
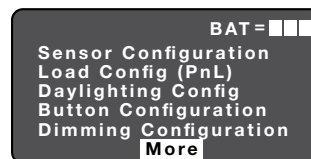
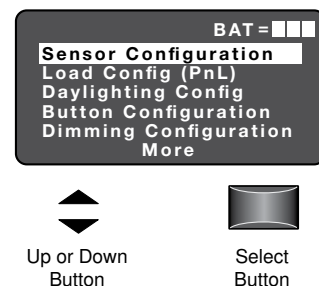
The ⏠ (Home) button takes you to the main menu. The ⏮ (Back) button can be thought of as an undo function. It takes you back one screen. Changes that were in process prior to pressing the ⏮ button are lost.



Home Menu

The Home (or Main) menu displays after the power-up process completes. It contains information on the battery status and six menu choices. Press up/down buttons to locate the desired function then press Select.

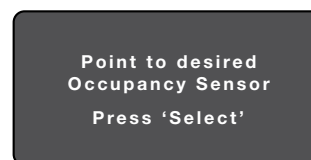
A second Main Menu contains additional Functions. Scroll down to **More** and press Select to view them.



Press Select **More** on the second screen to return to the first group of options.

For most options, when you press Select, a message appears on the screen telling you to point the LMCT-100-2 at a DLM device and press Select again. This establishes communication between the LMCT-100-2 and DLM devices.

For an occupancy sensor, the message tells you to point at the specific sensor you want to configure.



Point and Press Select

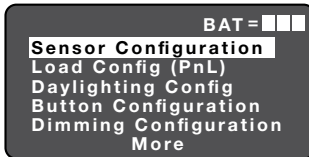
For other devices, such as room controllers, which have no IR sensor, the message tells you to point at any IR enabled device in the DLM network.



For buttons and paddles, the process involves an extra step of pressing the particular button on the device, as described in ["Button Configuration" on page 16](#).

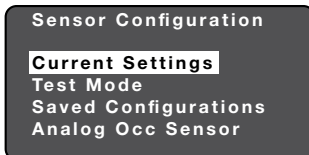
Once you make any changes and send the changes back to the device, you must repeat the process of pointing at the device and pressing Select.

SENSOR CONFIGURATION



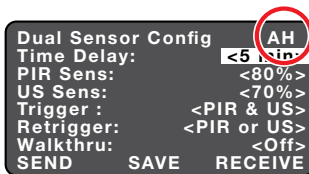
The Sensor Configuration menu includes options to view the current settings of an specific sensor, make changes, and send them back to the sensor. You can save those settings and then send the same settings to another sensor, which provides a quick way to configure multiple sensors. Additionally, a test option shortens the delay time, when performing a sensor walk test to define the optimum sensitivity settings and product orientation.

Current Settings



After selecting this option, point the LMCT-100-2 at a specific sensor and press Select. This enables communication between the sensor and the LMCT-100. The sensor immediately sends its current parameter settings.

The screen changes to show the current sensor settings where you can adjust sensor parameters. "AH" next to Sensor Config indicates that the sensor is currently in After Hours mode. Changes made while AH is displayed only affect After Hours operation.

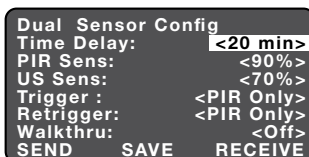


NOTE: To program After Hours operation during normal hours, you must force the room into After Hours mode. Selection the **Room Mode** function in the **Utilities** menu to switch between Normal and After Hours modes. Once programming is complete, you can return the room to Normal mode. See ["Utilities" on page 20](#) for details.

Adjusting Sensor Parameters

On the **Current Settings** screen, you can view all parameters applicable to the type of sensor that is currently communicating with the LMCT-100. You can modify settings, send them to the sensor, and/or store them in the LMCT-100.

NOTE: The screenshots in this section show a Dual Technology Sensor. For Ultrasonic or PIR sensors, only the appropriate parameters for that particular sensors are displayed.



Time Delay

The amount of time the load remains ON after no motion is detected.

Detection Sensitivity

- **PIR Sens** – Sensitivity for the PIR detection. Setting the sensitivity to zero (0) will disable PIR detection (Dual Tech and PIR sensors only).
- **US Sens** – Sensitivity for the ultrasonic detection. Setting the sensitivity to zero (0) will disable ultrasonic detection in the sensor (Ultrasonic sensors only).

Trigger/Retrigger Mode (Dual Tech Sensors only)

- **Trigger** – Indicates whether to use PIR, Ultrasonic, Either, or Both technologies for initial detection of occupancy. For "Either", the sensor will register occupancy if either of the two technologies senses movement, whereas for "Both", both technologies must detect movement.
- **Retrigger** – Indicates whether to use PIR, Ultrasonic, Either, or Both technologies will be used to keep the lights on once the sensor has initially been triggered. For "Either", the sensor will register occupancy if either of the two technologies senses movement, whereas for "Both", both technologies must detect movement.

Walk Through Mode

Walkthru shortens the time delay to reduce the amount of time the load is ON after a brief moment of occupancy, such as returning to an office to pick up a forgotten item then immediately exiting. When enabled, the load turns OFF three minutes after the area is initially occupied if no motion is detected after the first 30 seconds. If motion continues beyond the first 30 seconds, the selected time delay applies.

Send

This sends the settings to the sensor. Highlight **SEND** and press Select. Point the LMCT-100-2 at the Sensor and press Select again.

The LEDs on the sensor blink to confirm the message has been sent. To double-check that the new settings were sent to the sensor, see "Receive."

Save

This saves the settings in the LMCT-100-2 "Saved Configurations" menu function for future use. Highlight **SAVE** and press Select. The display shows the memory slot in which the settings are saved. Each time you save a configuration the "Memory Slot" number increases. You can save up to 9 configurations. Saved configurations are listed in the **Saved Configurations** function in the **Sensor Configuration** menu (see ["Saved Configurations" on page 5](#)).

Receive

This retrieves the current settings from the sensor.

Important: Selecting Receive before sending new settings to the sensor or saving them to LMCT-100-2 memory clears any value changes that you made.

Test Mode

In Test Mode, the sensor(s) in the room turn the load(s) off after 5 seconds and a 10 minute test period begins. During the test period, the time delay is 5 seconds. This short time delay allows performing a sensor walk test to define the optimum sensitivity settings and product orientation. After the 10 minute period all sensors return to normal operation mode. Or, select **EXIT** to return them immediately.

After selecting Test Mode, you can select an individual sensor or choose all sensors in the DLM network.

Sensor Configuration

Current Settings
Test Mode
Saved Configurations
Analog Occ Sensor

Sensor Test Mode

Individual Sensor
All Sensors on bus

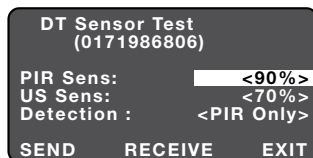
Sensor Testing – Individual Sensor

Use this option to put an individual sensor into test mode. After selecting **Individual Sensor**, point the LMCT-100-2 at that sensor and press Select

NOTE: The screenshots in this section show a Dual Technology Sensor. For Ultrasonic or PIR sensors, only the appropriate parameters for that particular sensors are displayed.

When testing an individual sensor, the serial number of that sensor is displayed on the second line of the screen.

Adjusting Sensitivity during Test



You can adjust sensitivity values while inside Test Mode. (The new values must be sent to the sensor before they take effect.)

PIR Sens – Passive Infrared sensitivity

US Sens – Ultrasonic sensitivity

Values are 0 to 100%, in 10% increments.

Detection Criteria (Dual Technology Sensors only)

You can select to test one or the other technology, or both technologies together. Available values: “PIR”, “US”, “PIR or US”, “PIR & US”.

Send

If you change sensitivity or detection values, you must select Send before they take effect. After the configuration is sent press Select to return to the test menu.

Receive

Retrieves settings from the sensor so you can view or modify them for further testing.

Exit

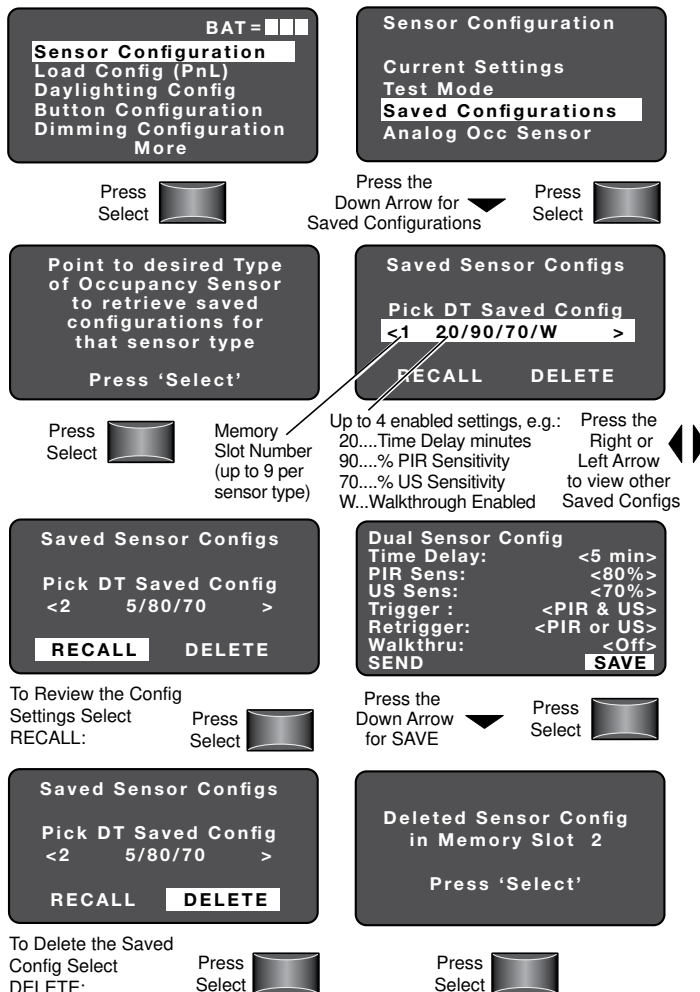
Exits test mode

Sensor Testing – All Sensors on Bus

When you select “All Sensors on bus”, you can test the selected sensor along with other sensors on the DLM Local Network (bus) to understand the coverage in the entire room.

SAVED CONFIGURATIONS

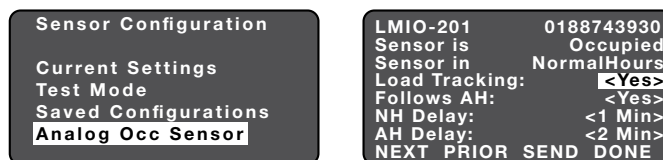
Use this feature to view the settings for any previously saved configurations and send those settings to a sensor. Using this feature, you can quickly configure multiple sensors with the same settings.



NOTE: If no saved configurations exist, you will see:
No Sensor Configurations exist, Press ‘Select’.

CONFIGURING ANALOG SENSORS

This option is used if you have an LMIO-201 connected to an analog sensor, which allows limited control of the analog sensor over DLM.



After selecting the **Analog Occ Sensors**, option, point the LMCT-100-2 at any IR enabled device in the room. There must be an LMIO-201 connected with an analog sensor wired correctly to the LMIO-201, or you will receive an error. If the LMIO-201 is connected and wired properly and you still receive an error, press the Config button on the LMIO-201. This will cause the LMIO-201 to join the local network again. Then try selecting the option again.

Once connection is established, the **LMIO-201** screen is displayed. The top line shows the serial number of the LMIO-201.

The next two lines display the current status of the sensor—whether it is currently registering as occupied and whether it is currently in Normal Hours or After Hours mode.

Load Tracking

If the sensor is bound to a room controller, this should always be set to “Yes”. This allows for the sensor to understand which loads are ON/OFF in order to properly manage presentation mode, and create error messages in the event that the sensor is not bound to any loads.

If the sensor is bound to a panel, this should be set to “No”. For panels, the Load IDs are not handled the same way. Instead of the sensor telling the panel which loads should turn on and when, the panels listen for certain MAC addresses from the sensors in order to determine if that sensor should control its loads.

Follows AH

If this is set to “No”, the sensor will ignore After Hours settings use the Normal Hours settings all the time.

NH Delay

The amount of time the load remains ON after no motion is detected, during Normal Hours.

AH Delay

The amount of time the load remains ON after no motion is detected, during After Hours.

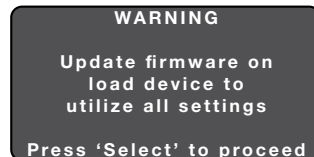
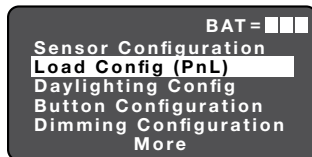
NOTE: Set the analog occupancy sensor to minimum time delay. The LMIO-201 digital time delay will be added to the minimum sensor time delay. So for example, if a sensor has a minimum time delay of 15 seconds and the LMIO-201 is set to 20 minutes, as in the screenshot above, the total delay time will be 20 minutes and 15 seconds.

LOAD CONFIGURATION (PNL)

Use the Load Configuration function to identify which load numbers have been assigned to which fixtures, view and change load parameters and load bindings to sensors. After selecting **Load Configuration (PnL)**, also known as Push n’ Learn™, point the LMCT-100-2 at any IR enabled DLM Local Network device and press Select.

Although PnL can be entered by pressing (and holding for three seconds) the Configuration button on a DLM device in the room, using the LMCT-100-2 provides access to additional parameters.

Important: To configure load binding from the LMCT-100, it must be initiated by the LMCT-100. After entering PnL you must exit before using the system.

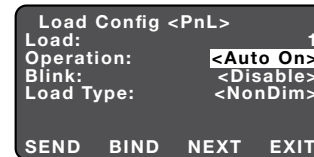


When the device receives the signal from the LMCT-100, the DLM Local Network goes into PnL mode; the red LED on all communicating devices starts blinking at 2x/second and all loads turn OFF except Load 1, which turns ON.

NOTE: If the room controller has an older version of firmware installed which does not support newer features in the LMCT-100, you will see a warning message. Firmware in the room controller can be updated using the LMCS-100 software.

Load Selection

Settings for load 1 appear first.



Push ▼ to highlight NEXT and push the SELECT button to turn ON the next load and view its settings.

Once the Load is selected, you can bind a button to the load by pressing that button. Use the **BIND** option on the screen to bind sensors to a load (this prevents having to access the button on a sensor placed in a hard to reach spot). The BIND function will toggle the sensor’s blue LED from on to off to indicate that the sensor no longer controls this load.

Operation

The operation mode determines if the load will be turned on automatically by a sensor, or only manually by a switch. Available values: “Auto On”, “Manual On”.

Blink

The Blink Warning flashes the load OFF then ON one minute prior to the sensor automatically turning the load OFF when the time delay expires.

Available values: “Disable”, “Enable”.

Load Type

NOTE: Different values will appear based on the type of controller. For example, if the controller is not capable of dimming, the <0–10V> value will not appear.

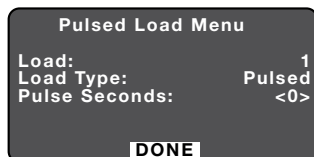
- **NonDim** – Indicates a switched load. Note that if a load is capable of dimming, selecting this value will not prevent the load from dimming.
- **0–10V** – Indicates a dimmed load.
- **Pulsed+** – When this value is selected, and On value for the controller will trigger the load for a specified amount of time and then turn Off. This is useful for integration with non-DLM devices. Some hardware only need a momentary pulse to initiate a change (like a motorized lift for instance). By setting the pulse time to 1 second, when a DLM button is pressed, the lift will get the signal it needs to initiate it’s task. Another example would be motorized shades. If it takes about 5 seconds to raise/lower the shades you would set to pulse for 5 seconds. Then when a connected button is pressed, the load turns on for 5 seconds and then turns off automatically.
- When “Pulsed+” is selected, press **Select** to display the **Pulsed Load Menu** (shown below).

NOTE: This feature requires firmware versions of 6.17 or later for the LMRC-111/112, or 6.29 or later for all other room controllers.

- **HID** – This turns off the Blink Warn feature. It is intended for use with loads High Intensity Discharge loads, since they cannot immediately turn back on after turning off.
- **AS-100** – This value is for use with the AS-100 Automatic Control Switch. The AS-100 is a switch that controls the line voltage (instead of sending a low voltage control message to the room controller). Instead, the AS-100 responds to timed power interrupt signals coming from the controller, providing automatic shutoff with a blink warning when transitioning between normal hours and after hours. Other timed interrupt signals can turn the power on or off.
- **Incand** – Applies to LMRC-22x controllers only. This should be used with Incandescent, Magnetic Low Voltage, Cold Cathode, or Neon ballasts. It provides a direct (straight line) reduction of voltage from 100% to minimum, with a commensurate reduction of light from the fixture.

- **HiLum** – Applies to LMRC-22x controllers only. This is used for 2 wire dimming ballasts such as the Phillips Advance X. These ballasts can't use a straight line voltage reduction because at some point there isn't enough voltage to power the electronics in the ballast itself. This value provides a smaller range of voltage change, resulting in an output from 100% to minimum %.
- **MarkX** – Applies to LMRC-22x controllers only. This used for 3 wire dimming ballasts that have both a dimming hot wire and a switched hot wire, such as the HiLume fixtures.

Pulsed Load Menu



This menu displays when "Pulsed" is selected for the **Load Type** and **Select** is pressed. Change the **Pulse Seconds** parameter to set the length of the pulse. Then select DONE to return to the Load Config <PnL> screen.

Send

To update the load parameters in the room controller, select **SEND**, point the LMCT-100-2 at any IR enabled device, and press Select again.

New settings are sent to the selected load. Wait 5–6 seconds for the message to clear. You can then select another function (BIND, NEXT, EXIT). To instantly end load configuration press the HOME key.

Bind

This feature binds an occupancy sensor to the selected load. After selecting **BIND**, point the LMCT-100-2 to a specific occupancy sensor, and press Select.

You can repeat this process to bind more than one sensor to the same load.

Next

Select another load. When NEXT is selected, Load 1 turns OFF and Load 2 turns ON.

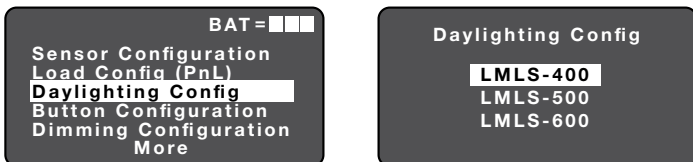
Exit

This ends the configuration function and exits PnL.

DAYLIGHTING CONFIGURATION

Daylighting Config allows you to setup daylighting and operation parameters specific to the type of sensor that is communicating with the LMCT-100. Different menu options are displayed depending upon the device.

Once you select **Daylighting Config**, you select the model of the sensor you want to configure.



Note regarding IR communication with the LMLS-600:

Because of the great mounting heights of skylight sensors in high-bay applications, it is important to stand directly underneath the sensor, with the LMCT-100-2 held in a vertical orientation pointed at the bottom of the sensor.

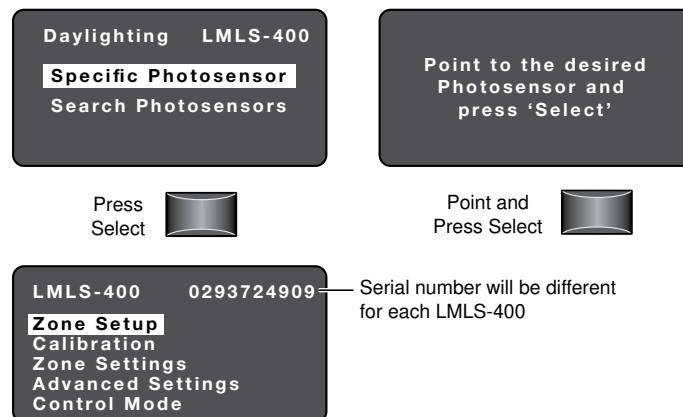
In some cases, direct communications between the LMCT-100-2 and the LMLS-600 may be difficult to achieve due to interference from very high ambient light when looking up, from direct sunlight, high intensity fluorescent fixtures (e.g., T5HO) mounted close to the sensor, as well as some other intense light sources. In these cases, communications can be established with the sensor by aiming the LMCT-100-2 at another DLM product in the room with a visible IR window (e.g., a wall switch or occupancy sensor).

Refer to the specific LMLS installation instructions for details about daylighting setup and operation of each of the models listed below.

Once you select a particular model, you have two choices: **Specific Photosensor** or **Search Photosensor**.

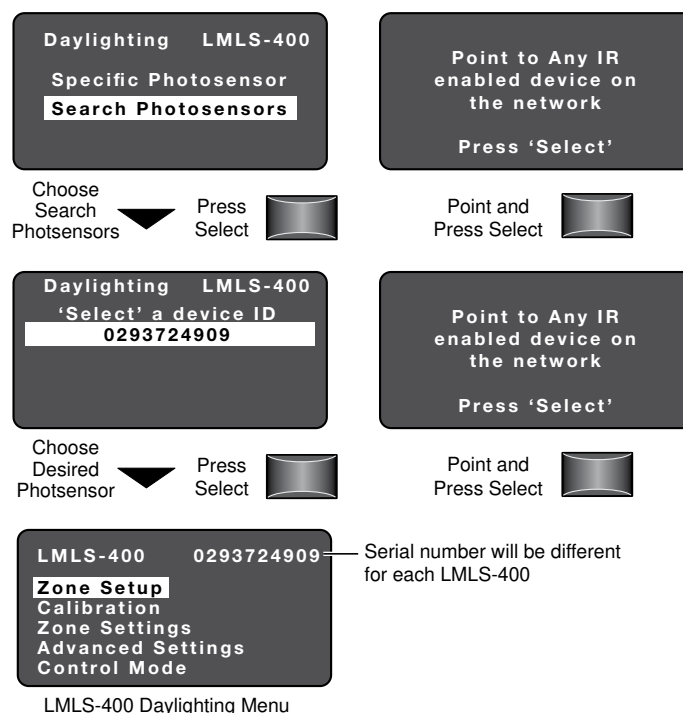
Specific Photosensor

Use this function if you are pointing the LMCT-100-2 directly at a specific photosensor.



Search Photosensor

The Search Photosensor function allows you to identify which LMLS device will be commissioned. After enabling and pointing the LMCT-100-2 to any DLM device, a list of all photosensors **of the previously selected model** in the DLM Local Network appears on the screen. Each DLM device has its own serial number. One advantage to this method is that you can point the LMCT-100-2 at a switch or other easily accessible DLM device.



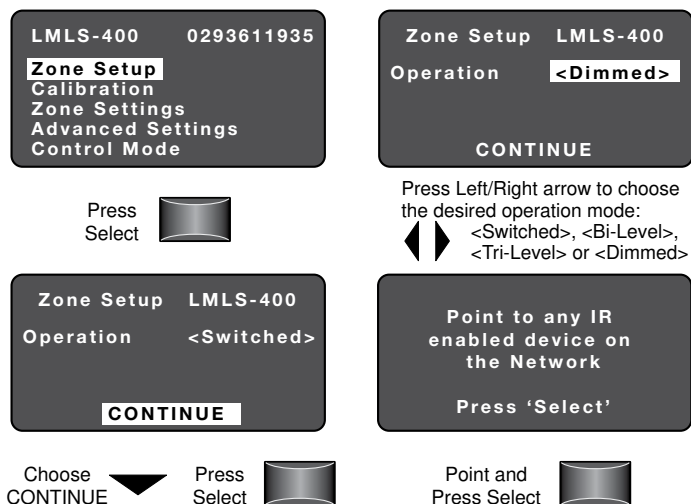
LMLS-400 Daylighting Menu

Zone Setup (LMLS400/LMLS-600 Only)

Selecting the Operating Mode

Zone Setup allows you to select and change the Operation Mode of a zone, specify if a selected load is to be controlled by Daylighting and to bind loads to the device. To configure zones for the LMLS-500 refer to ["Zone Setup \(LMLS-500 Only\)" on page 9](#).

After choosing Zone Setup and pressing Select, the current operation mode is displayed. Available values are: Switched, Bi-Level, Tri-Level, or Dimmed.



Switched

Switched mode provides ON/OFF switching within the daylighting zone controlled by the photosensor.

Load 1 - OFF 0% ————

Load 1 - ON 100% ————

Bi-Level

Bi-level mode provides three light levels within the daylighting zone controlled by the photosensor by using 2 load circuits.

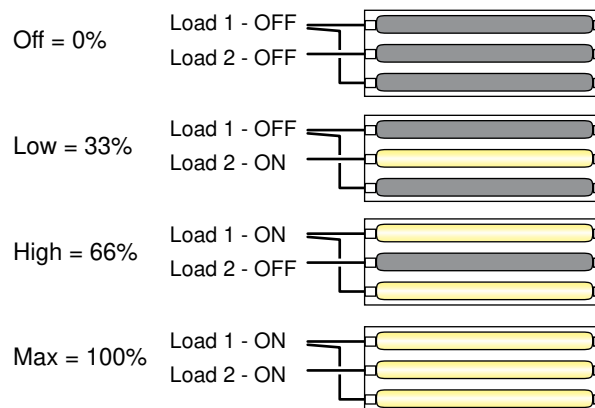
Off = 0% Load 1 - OFF Load 2 - OFF

Med = 50% Load 1 - ON Load 2 - OFF

Max = 100% Load 1 - ON Load 2 - ON

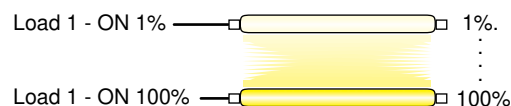
Tri-Level

Tri-level mode provides four light levels within the daylighting zone controlled by the photosensor by using 2 load circuits.



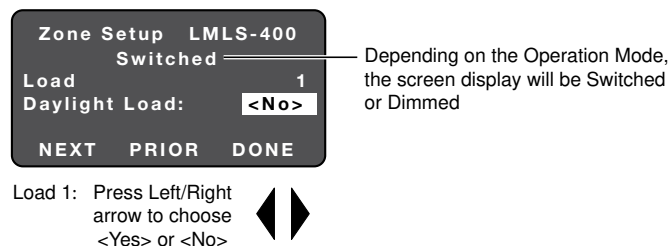
Dimmed

Dimmed mode provides continuous dimming within the daylight zone controlled by the photosensor.

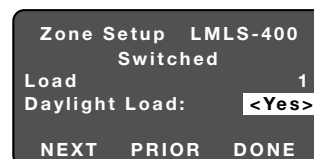


Switched and Dimmed Load Assignment

The load binding process for Switched loads and Dimmed loads is the same.

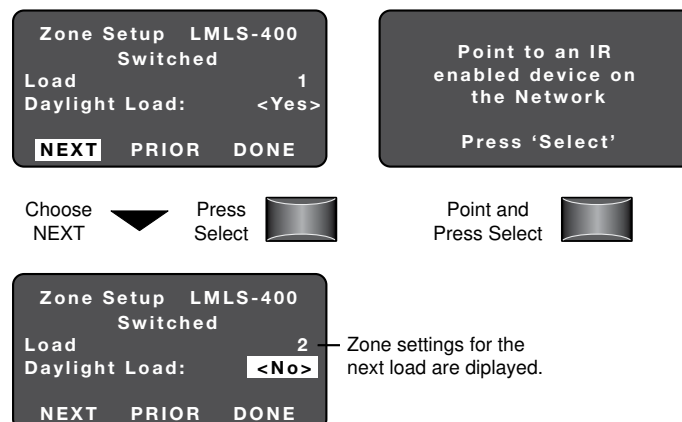


To do load binding the load needs to be assigned as a **Daylight Load** by selecting "Yes".



Next

To continue to assign Daylight Load binding to load 2, choose **NEXT**.



Prior

To assign Daylight Load binding to the previous load, choose **PRIOR**. This is similar to **NEXT**, but chooses the previous load. This function behaves the same for all Operation Modes.

Done

When you have completed all load bindings, choose **DONE**. This function behaves the same for all Operation Modes.

Bi-Level Load Assignment

To do load binding the load needs to be assigned as a Daylight Load by selecting "Yes". **Next**, **Prior** and **Done** function the same as for Switched and Dimmed.

Zone Setup LMLS-400	
Bi-Level	
Load	1
Daylight Load:	<No>
NEXT PRIOR DONE	

Zone Setup LMLS-400	
Bi-Level	
Load	1
Daylight Load:	<Yes>
ON When:	<Med & Max>
NEXT PRIOR DONE	

For Load 1: Press Left/Right arrow to choose <Yes> or <No>

If <Yes> is selected, **ON When** appears after scrolling down.

Press Left/Right arrow to choose <Med & Max> or <Max>

Tri-Level Load Assignment

To do load binding the load needs to be assigned as a Daylight Load by selecting "Yes".

Zone Setup LMLS-400	
Tri-Level	
Load	1
Daylight Load:	<No>
NEXT PRIOR DONE	

Zone Setup LMLS-400	
Tri-Level	
Load	1
Daylight Load:	<Yes>
ON When:	<Low & Max>
NEXT PRIOR DONE	

For Load 1: Press Left/Right arrow to choose <Yes> or <No>

If <Yes> is selected, **ON When** appears after scrolling down

Press Left/Right arrow to choose <Hi & Max> or <Low & Max>

Next, **Prior** and **Done** function the same as for Switched and Dimmed.

Zone Setup (LMLS-500 Only)

Selecting the Operation Mode

Zone Setup allows you to select the number of zones, change the operation mode of a zone, specify if a selected load is to be controlled by Daylighting and to bind loads to the LMLS-500.

For each zone, the Operating Mode types are the same as for the LMLS-400 and LMLS-600. See ["Selecting the Operating Mode" on page 8](#) for details.

LMLS-500 0293724909	
Zone Setup	
Calibration	
Zone Settings	
Advanced Settings	
Control Mode	

Press Select

Zone Setup LMLS-500	
Number of Zones <3>	
Choose the number of Daylighting Zones	
CONTINUE	

Press Left/Right arrow to select the number of Zones (1, 2, or 3)

Zone Setup LMLS-500	
Number of Zones <3>	
Choose the number of Daylighting Zones	
CONTINUE	

Choose CONTINUE

Press Select

Zone Setup LMLS-500	
Point to Any IR enabled device on the network	
Press 'Select'	

Point and Press Select

Zone Setup LMLS-500	
Zone 1: <Bi-Level>	
Zone 2: <Switched>	
Zone 3: <Tri-Level>	
Pick a control type for ALL Zones	
CONTINUE	

Press Left/Right arrow to choose the desired operation mode for each Zone: <Switched>, <Bi-Level>, <Tri-Level> or <Dimmed>

Point and Press Select

Switched and Dimmed Load Assignment

The load binding process for Switched loads and Dimmed loads is the same as it is for the LMLS-400 and LMLS-600. However, instead of the **Daylight Load** parameter used when programming those models, the LMLS-500 screen has a **Zone** parameter. By default it is set to "None". You must select a Zone for the load.

Zone Setup LMLS-500	
Switched	
Load:	1
Zone:	<None>
NEXT PRIOR DONE	

Load 1: Press Left/Right arrow to select the Zone

Depending on the Operation Mode, the screen display will be Switched or Dimmed

Once the zone is assigned, select **NEXT** to continue to the next Load. **Next**, **Prior** and **Done** function the same as they do for the LMLS-400. See the previous page for details.

Bi-Level and Tr-Level Load Assignment

Once again this load binding is the same as for the LMLS-400, but the **Zone** parameter is displayed instead of **Daylight Load**. You must select a Zone for the load.

Zone Setup LMLS-500	
Bi-Level	
Load:	1
Zone:	<None>
NEXT PRIOR DONE	

Load 1: Press Left/Right arrow to select the Zone

Zone Setup LMLS-500	
Bi-Level	
Load	1
Daylight Load:	<Yes>
ON When:	<Max>
NEXT PRIOR DONE	

Press Left/Right arrow to choose a specific value

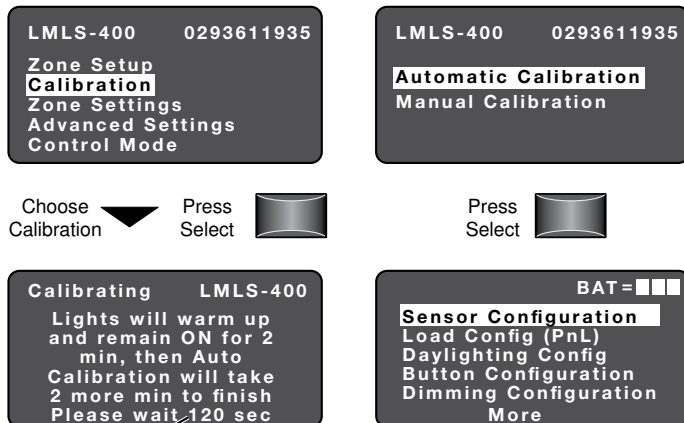
If a Zone is selected, **ON When** appears after scrolling down.

Once the zone is assigned, select **NEXT** to continue to the next Load. **Next**, **Prior** and **Done** function the same as they do for the LMLS-400. See the previous section for details.

Calibration (LMLS-400 Only)

Calibration establishes a relationship between the workplace luminance and the light level measured by the sensor. This can be done Automatically or Manually.

Automatic Calibration

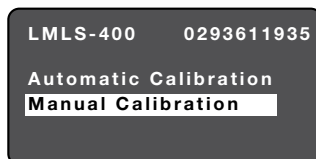


Counts down from 120 seconds then returns to the Main Menu; the Automatic Calibration process continues for 2 minutes, with the controlled loads switching ON and OFF, then the sensor enters Test Mode for 5 minutes.

Automatic Calibration can be started by the LMCT-100, or by pressing and holding the user pushbutton located in the sensor head.

1. Complete all wiring and turn power on to the connected room controller.
2. Press and hold the user button for at least 2 seconds then release, or activate automatic calibration from the LMCT-100.
3. Blue LED will start flashing once every 4 sec.
4. Daylighting controlled loads will automatically turn ON for 2 minutes to allow controlled lamps to warm up and reach a stable full output.
5. Remove any objects that may affect the LMLS-400 light level reading (ladder or temporary objects).
6. Lights will cycle eight times for automatic setpoint selection.
7. The photosensor is in Test Mode when the blue LED starts flashing once per second. For the next 5 minutes the sensor will be in Test Mode.
8. Verify the setpoints automatically selected by the photo sensor with the LMCT-100. If the automatic selected setpoints are not acceptable, proceed to manual calibration.

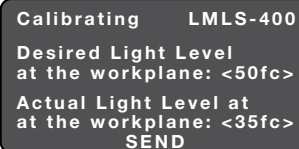
Manual Calibration



After selecting **Manual Calibration**, the display changes based on the Operating Mode.

Switched, Bi-Level and Tri-Level

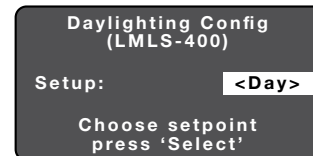
Choose a reference location within the daylighting zone that is most likely to have the lowest light level when day lit and is located farthest from the window.



To set the On and Off Setpoints automatically to best match a designed light level for the workplace, enter the desired level, along with the present measured level (from a light meter), and then press **SEND**, point the LMCT-100-2 at an IR enabled device, and press Select..

Dimmed

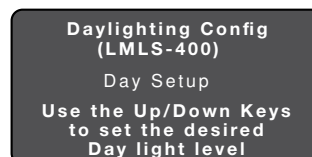
For a dimmed Operating Mode, you must calibrate the LMLS-400 separately for Day and for Night.



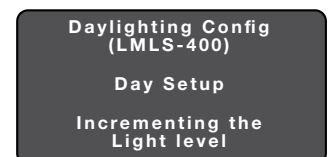
Day Setup

Make this adjustment when there is enough daylight to provide 40% to 90% of the target light level. For example, if the target is 40 footcandles, make this adjustment when the daylight contribution is between 16 and 36 footcandles.

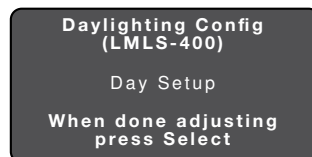
1. Press the Day button.
2. Using a light meter at the task surface, press the Up and Down LMCT-100-2 arrows to adjust light levels.
3. Once the target level has been reached, press the Select button to hold the value.
4. When Day and Night adjustments are complete, press HOME to exit the calibration process and return to normal operation.
5. To set the desired light level, point to the LMLS-400 and continue pointing to it while pressing the ▲/▼ keys. The ▲ key increments and the ▼ key decrements the light level.



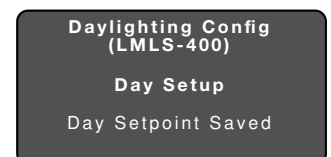
Press Up/Down arrow ▲ Increment (raise) ▼ Decrement (lower)



Continue adjusting pressing the Up or Down arrow until desired Light Level is achieved ▲ ▼

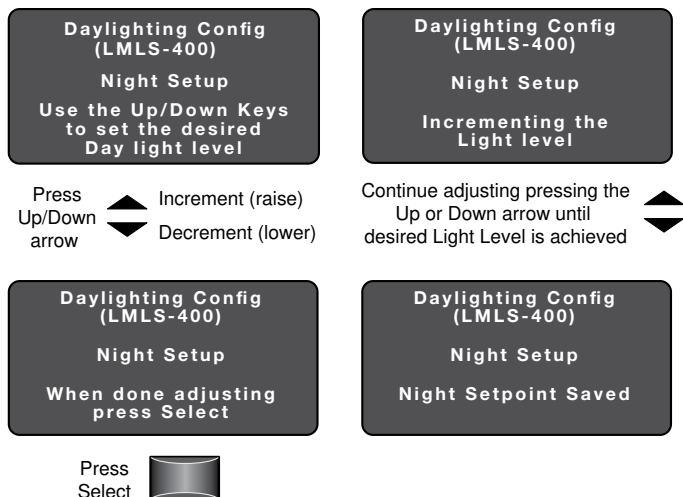


Press Select



Night Setup

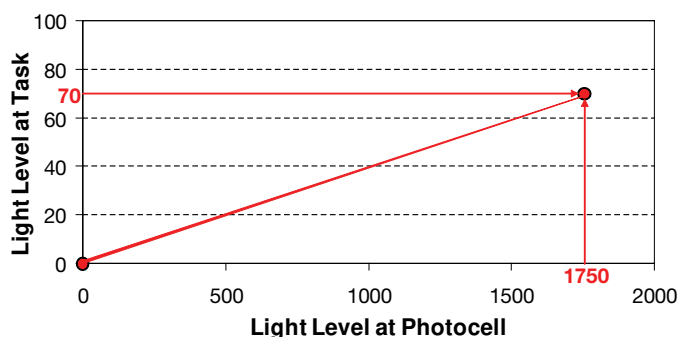
To set the desired light level, point to the LMLS-400 and continue pointing to it while pressing the ▲/▼ keys. The ▲ key increments and the ▼ key decrements the light level.



When Day and Night adjustments are complete, press the HOME key to terminate Manual Calibration and return to normal operation.

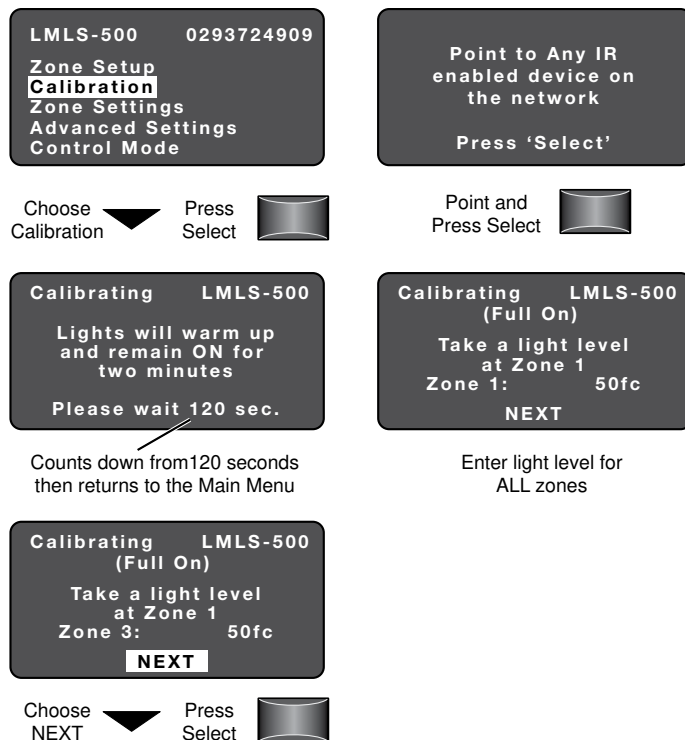
Calibration (LMLS-500 Only)

Calibration allows you to establish a relationship between the workplane luminance and the measured daylight at the photocell.



Use the LMCT-100-2 for the Calibration process.

1. Complete all wiring and turn power ON to the connected room controllers.
2. Select the LMLS-500 to be calibrated using the LMCT-100.
3. Select Calibration. For each Zone, choose a reference location that is most likely to have the lowest light level when day lit for each zone.
4. With the electric lights ON, use a light meter to measure the light level in each zone.
5. Enter the measured light level at the task surface per zone, in the LMCT-100.
6. Daylighting controlled loads will turn OFF.
7. Use a light meter to measure the light level in each zone.
8. Enter the measured light level at the task surface per zone in the LMCT-100.
9. Select the Send button to establish communication with the LMLS-500.

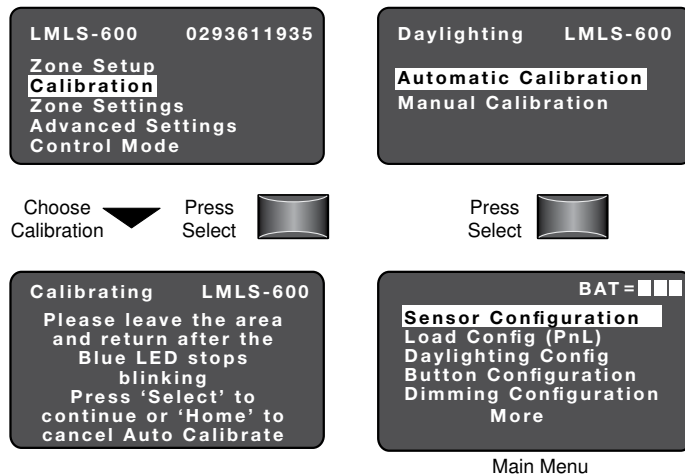


Calibration (LMLS-600 Only)

The role of the calibration process is to establish, for the controlled zone, the appropriate setpoint for operation, to learn the dimming curves of the controlled loads, and to create an initial daylight ratio for closed-loop versus open-loop sensors. This can be done Automatically or Manually.

Automatic Calibration

Automatic Calibration can be started by the LMCT-100, a similar menu in LMCS, or by pressing and holding the user pushbutton (located on the bottom of the sensor, farthest from the RJ45 connection) for three seconds.



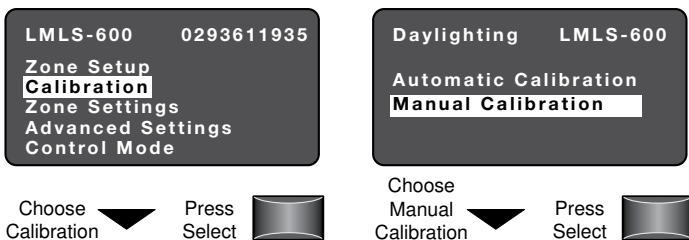
NOTE: It is critical that, during the Automatic Calibration process, the area under the sensor, as well as the skylight area, remain free of any obstructions, and that no changes occur (including human foot traffic) within the cone-of-view of the closed loop sensor. Please clear the area before starting the Automatic Calibration, and wait for the calibration completion (when the blue LED stops flashing once every 4 seconds) before reentering the area.

The Calibration process consists of:

- Pausing for 15 seconds to allow the user to vacate the area under the sensor.
- Turning off all configured loads, for about 10 seconds, to compute an initial daylight ratio.
- Warming up the controlled loads, at maximum level, until they reach full output (typically, this requires several minutes).
- Switching or Fading the level of the controlled loads from maximum to minimum level very slowly (over approximately two minutes) while observing both sensors, to determine the ballast curve.
- Turning the controlled loads off completely, and observing both sensors for several seconds, to calculate daylight ratios..
- Validating the data collected, and marking the sensor as calibrated (and active) if a good calibration has been established. If the calibration should fail, the LEDs will revert to showing an "Awaiting Calibration" state and the process must be repeated.

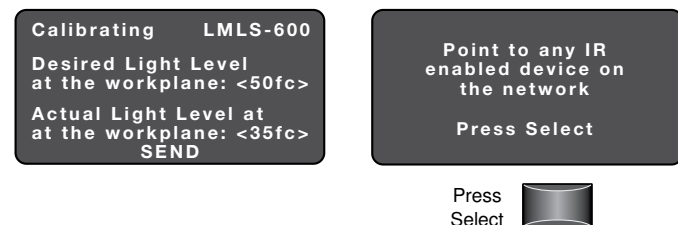
Manual Calibration

Manual Calibration allows you to refine the setpoint for the controlled zone.



NOTE: Even if you wish to refine the setpoints using the Manual Calibration feature, you **MUST** first complete an Automatic Calibration to establish the other critical installation parameters.

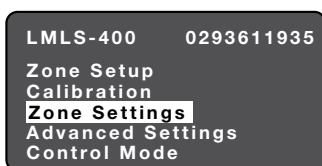
Choose a reference location within the daylighting zone that is most likely to have the lowest light level when day lit and is located farthest from the window.



To set the Dimming and On and Off Setpoints automatically to best match a designed light level for the workplane, enter the desired level, along with the present measured level (from a light meter), and then press SEND.

Zone Settings (LMLS-400 Only)

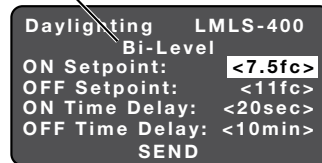
Zone Settings allows you to modify the photosensor Daylighting Setpoints, Time Delays and Ramp Rates.



When Zone Settings is selected, one of two screens is displayed depending on the Operation Mode of the device (Switched, Bi-Level, or Tri-Level) or (Dimmed).

Switched, Bi-Level, or Tri-Level

This heading differs depending on Operation Mode



ON Setpoint

The target illuminance level at the sensor, below which the photosensor turns the lights ON.

The ON Setpoint values available for manual adjustment are: 1.0, 1.2, 1.5, 1.8, 2.2, 2.7, 3.3, 4.0, 5.0, 6.0, 7.5, 9.0, 11, 13, 16, 20, 25, 30, 35, 45, 60, 90, 125, 180, 250, 325, 400, 475, 550, 625, 700, 775 and 850 footcandles; note that calibration can automatically select a value not in this list.

OFF Setpoint

The target illuminance level at the sensor, above which the photosensor turns the lights OFF.

The OFF Setpoint corresponds to the ON Setpoint multiplied by 1.25, 1.50, 1.75 or 2.0. This ensures that the OFF Setpoint is always higher than the On Setpoint.

ON Time Delay

The time interval that must elapse, with the measured level below the ON Setpoint, before the controlled lights turn on.

Range: 1 sec to 60 sec.

OFF Time Delay

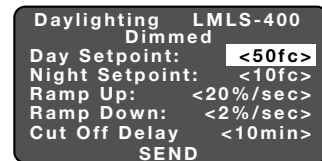
The time interval that must elapse, with the measured level above the OFF Setpoint, before the controlled lights turn OFF.

Range: 3 min to 30 min.

Send

To send the changed settings to the LMLS-400, select **SEND**, point the LMCT-100-2 at an IR enabled device, and press Select.

Dimmed



Day Setpoint

The desired light level at the sensor during daytime. To determine the correct dimming level for any given photocell reading, it calculates the level based on the slope between the day and the night setpoint.

Range: 1 fc to 255 fc.

Night Setpoint

The desired light level at the sensor during nighttime. To determine the correct dimming level for any given photocell reading, it calculates the level based on the slope between the day and the night setpoint.

Range: 1 fc to 255 fc.

NOTE: The Day Setpoint must always be greater than the Night Setpoint.

Ramp Up

Determines the speed (or rate) at which the light level of bound loads increases. The default is 20% per second because the end user needs light quickly.

Range: 1% per second to 100% per second.

Ramp Down

Determines the speed (or rate) at which the light level of bound loads decreases. The default is 2% per second because a slow ramp down will help the eye adapt to the new light level.

Range: 1% per second to 100% per second.

Cut Off Delay

The time that the controlled lighting will remain at a minimum dimmed level, even with high daylight contribution, before the lights will be switched OFF.

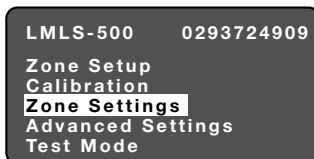
Range: Never to 30 min.

Send

To send the changed settings to the LMLS-400, select **SEND**, point the LMCT-100-2 at an IR enabled device, and press Select.

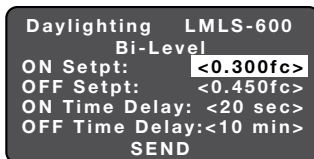
Zone Settings (LMLS-500 Only)

Zone Settings allows you to modify the photosensor Daylighting Setpoints, Time Delays and Ramp Rates.



When Zone Settings is selected, one of two screens is displayed depending on the Operation Mode of the Zone (Switched) or (Dimming, Bi-Level or Tri-Level):

Switched, Bi-Level, or Tri-Level



ON Setpoint

The target illuminance level below which the LMLS-500 turns the lights ON.

Range: 5 to 150 fc.

OFF Setpoint

The target illuminance level above which the LMLS-500 turns the lights OFF.

The OFF Setpoint corresponds to the ON Setpoint multiplied by 1.25, 1.50, 1.75 or 2.0. This ensures that the OFF Setpoint is always higher than the ON Setpoint.

ON Time Delay

The time interval that must elapse, with the measured level below the ON Setpoint, before the controlled lights turn ON.

Range: 1 sec to 60 sec.

OFF Time Delay

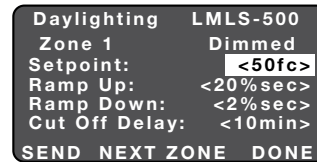
The time interval that must elapse, with the measured level above the OFF Setpoint, before the controlled lights turn OFF.

Range: 3 min to 30 min.

Send

To send the changed settings to the LMLS-500, select **SEND**, point the LMCT-100-2 at an IR enabled device, and press Select.

Dimmed



Setpoint

The desired light level at the task per zone. To determine the correct dimming level for any given photocell reading, it calculates the level based on the slope between the daylight contribution at the sensor and the setpoint.

Range: 5 to 200 fc.

Ramp Up

Determines the speed (or rate) at which the light level of bound loads increases. The default is 20% per second because the end user needs light quickly.

Range: 1% per second to 100% per second.

Ramp Down

Determines the speed (or rate) at which the light level of bound loads decreases. The default is 2% per second because a slow ramp down will help the eye adapt to the new light level.

Range: 1% per second to 100% per second.

Cut Off Delay

The time that the controlled lighting will remain at a minimum dimmed level, even with high daylight contribution, before the lights will be switched OFF.

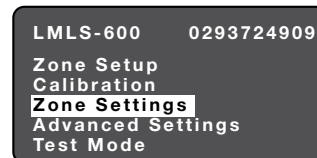
Range: Never to 30 min.

Send

To send the changed settings to the LMLS-500, select **SEND**, point the LMCT-100-2 at an IR enabled device, and press Select.

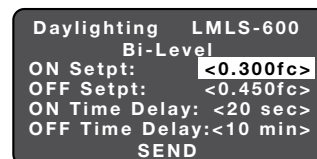
Zone Settings (LMLS-600 Only)

Zone Settings allows you to modify the photosensor Daylighting Setpoints, Time Delays and Ramp Rates.



When Zone Settings is selected, one of two screens is displayed depending on the Operation Mode of the Zone (Switched) or (Dimming, Bi-Level or Tri-Level):

Switched, Bi-Level, or Tri-Level



ON Setpoint

The target illuminance level below which the LMLS-600 turns the lights ON.

Range: minimum of 1 fc; maximum of 32 fc (for Switched) or 48 fc (for Bi-Level or Tri-Level).

OFF Setpoint

The target illuminance level above which the LMLS-600 turns the lights OFF.

The OFF Setpoint corresponds to the ON Setpoint multiplied by 1.25, 1.50, 1.75 or 2.0.

This ensures that the OFF Setpoint is always higher than the ON Setpoint.

ON Time Delay

The time interval that must elapse, with the measured level below the ON Setpoint, before the controlled lights turn ON.

Range: 15 sec to 60 sec.

OFF Time Delay

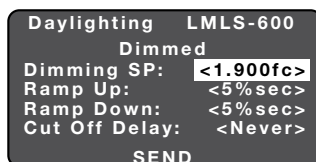
The time interval that must elapse, with the measured level above the OFF Setpoint, before the controlled lights turn OFF.

Range: 3 min to 30 min.

Send

To send the changed settings to the LMLS-600, select **SEND**, point the LMCT-100-2 at an IR enabled device, and press Select.

Dimmed



Dimming Setpoint

The desired light level is maintained by daylighting control, as measured by the down-looking sensor. When the present measured light level differs from this setpoint by more than approximately 7%, the sensor will attempt to adjust the electric lighting to compensate.

Range: 0 to 65 fc

Ramp Up

Determines the speed (or rate) at which the light level of bound loads increases. The default is 5% per second.

Range: 1% per second to 100% per second.

Ramp Down

Determines the speed (or rate) at which the light level of bound loads decreases. The default is 5% per second.

Range: 1% per second to 100% per second.

Cut Off Delay

The time that the controlled lighting will remain at a minimum dimmed level, even with high daylight contribution, before the lights will be switched OFF.

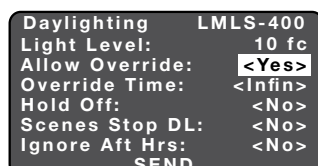
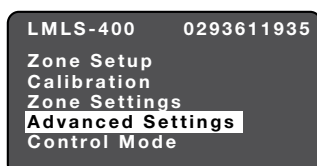
Range: Never to 60 min.

Send

To send the changed settings to the LMLS-600, select **SEND**, point the LMCT-100-2 at an IR enabled device, and press Select.

Advanced Settings (LMLS-400 only)

Advanced Settings allows you to see the light level at the photocell, adjust the override mode, the override time delay, hold off, scene switch and after hours interaction.



Light Level

Present light level measured at the DLM photosensor.

Allow Override

Determines if overriding the photosensor is permitted or not.

Available choices: Yes or No.

Override Time

Override Time selects the delay, after daylighting control has been disabled due to an observed external user or system action, before automatic control resumes.

Range: Infinity or 1 to 24 hours.

Hold Off

The Hold Off setting selects the behavior of daylighting loads when they are turned ON, by a switch or occupancy sensor.

If Hold Off = <No> (default), the loads can always be turned on to their previous level, and then will begin to adjust based upon daylight.

If Hold Off = <Yes>, the sensor will limit the loads to the level presently allowed by daylight contribution. This means that the loads may not initially turn ON (if the ambient light level is high—above the ON or Dimming Setpoint), but will become active for daylighting control, and will turn ON or dim up as daylight contribution drops.”

Scenes Stop DL

When set to No, the sensor allows daylighting to adjust light levels, up to the level recorded in the Scene, even though a scene is active. When set to Yes, daylighting control is disabled for any loads on which a scene is recalled until a change is manually made to the level of a load in the zone, or until the next cycle of occupancy.

Ignore After Hours

When set to Yes, the photosensor will ignore After Hours and will continue to operate as normal.

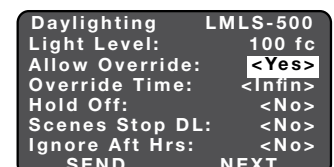
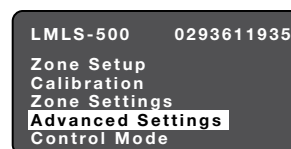
When set to No, the daylighting controlled loads that are set to After Hours mode will be temporarily removed from daylighting control while in the After Hours state.

Send

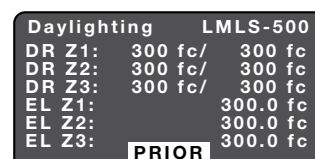
To send the changed settings to the sensor, select **SEND**, point the LMCT-100-2 at an IR enabled device, and press Select.

Advanced Settings (LMLS-500 only)

Advanced Settings allows you to see the light level at the photocell, adjust the override mode, the override time delay, hold off, scene switch and after hours interaction.



The first screen of parameters for the LMLS-500 is identical to the LMLS-400. Refer to that section for details. However, the LMLS-500 has a **NEXT** option. Select that option to display the following screen.



This screen displays the current readings of the Daylight Ratio (DR) and Electric Light contribution (EL) for each zone.

Advanced Settings (LMLS-600 only)

Advanced settings allows you to see the light level at the photocell and to adjust the override mode and the override time delay.



Up and Down Light Levels:

Present light level measured at the up and down looking photodiode.

Up looking range: 0 to 6500 fc

Down looking range: 0 to 65 fc

Allow Override

Determines if override mode is permitted, while daylighting control is active.

Available choices: Yes or No

Override Time

Override Time selects the time delay, after daylighting control has been disabled due to an observed external user or system action, before automatic control resumes.

Range: Infinity or 1 to 24 hours.

Hold OFF

The Hold Off setting selects the behavior of daylighting loads when they are turned ON, by a switch or occupancy sensor.

If Hold Off = <No> (default), the loads can always be turned on to their previous level, and then will begin to adjust based upon daylight.

If Hold Off = <Yes>, the sensor will limit the loads to the level presently allowed by daylight contribution. This means that the loads may not initially turn ON (if the ambient light level is high—above the ON or Dimming Setpoint), but will become active for daylighting control, and will turn ON or dim up as daylight contribution drops.

Scenes Stop DL

When set to No the sensor adjusts levels, up to that recorded in the scene, even though a scene is active. When set to Yes, daylighting control is disabled for any loads on which a scene is recalled until a change is manually made to the level of the load, or until the next cycle of occupancy.

Ignore After Hours

When set to Yes, the photosensor will ignore After Hours and will continue to operate as normal.

When set to No, the daylighting controlled loads that are set to After Hours are removed from daylighting control for the duration of the After Hours period.

Next

To set the Recommissioning Threshold and Recommissioning Delay, choose NEXT.



Maximum Electric Light:

Maximum Electric Light shows the maximum output of all of the controlled electric lights, as seen in the closed-loop (down-looking) sensor.

Daylight Ratio:

Shows the latest average ratio between the daylight contribution seen in the closed-loop (down-looking) sensor and that measured by the open-loop (up-looking) sensor.

Force Open Loop:

When set to "Yes", this parameter causes the sensor to always reference the Open-Loop sensor during control operations, and use the Closed-Loop sensor only for Automatic Calibration process. For true dual-loop control, this parameter must be set to "No".

Available choices: Yes or No

Recomm Thresh

The open-loop light level below which the LMLS-600 enters recommissioning mode. If this parameter is set to 0, automatic daily recommissioning is disabled.

Range: 0 to 255

Recomm Delay

The time that must elapse, with the open-loop light level remaining below the Recommissioning Threshold, before Recommissioning starts.

Range: 0 to 240 min

Enable Diagnostic Messages:

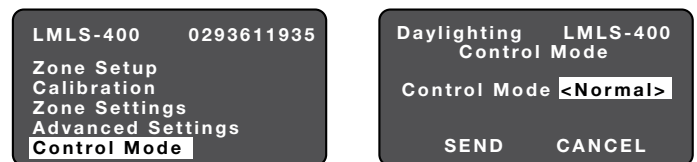
Controls reporting of diagnostic information, visually and over the DLM IRB. Select "LED" (default) to enable the red LED flash pattern indicating Occupant Interference. Choose "None" to disable the red LED indication and all other messages. Select "All" only if so directed by WattStopper technicians.

Send

To send the changed settings to the LMLS-600, select **SEND**, point the LMCT-100-2 at an IR enabled device, and press Select.

Control Mode

Control Mode allows you to select the control behavior of the photosensor. After choosing Control Mode and pressing Select, point to the LMLS device and press Select. The current control mode is displayed. This can be changed to Normal, Test, Demo, or Disable.

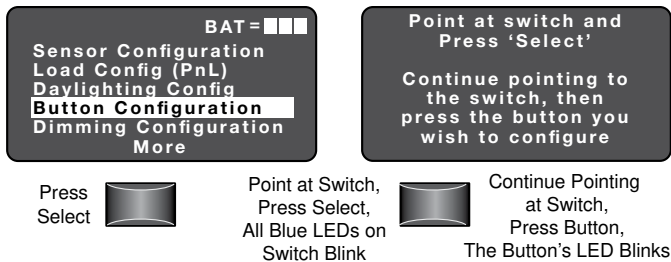


Press the left/right arrow to scroll through the options.

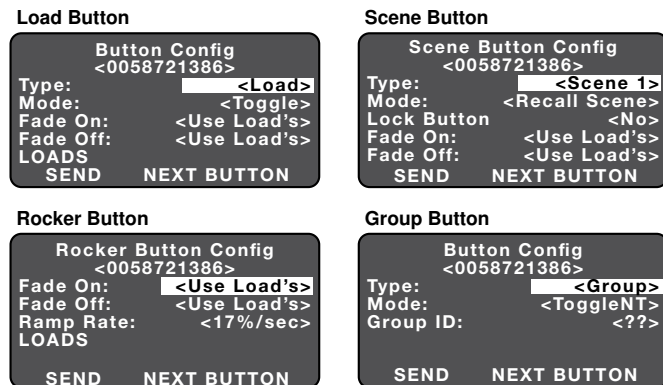
- **Normal** – Allows the photosensor to take control of the daylighting loads.
- **Test** – Shortens timeouts for switching operation, and speeds ramp rates for dimming operation, to allow quick verification. Test Mode cancels automatically after 5 minutes.
- **Demo** – Allows the photosensor to select a set of preset parameters. This mode should only be selected when demonstrating the functionality of the unit is desired.
- **Disable** – Allows you to temporarily prevent the photosensor from controlling its assigned loads. While in this mode, the sensor will continue to report light levels, but will not adjust any loads. This parameter is mostly used for troubleshooting purposes.

BUTTON CONFIGURATION

Button Configuration enables communication between the load, its assigned switch and the LMCT-100. Use the Button Configuration screen to assign the button to a specific button function type, and to change parameter values such as modes and fade times, based on the function type.



Based on whether the button pressed is a Scene Button, Load Button Rocker Button, or Group Button, one of the following screens is presented.



Load Button Parameters



Type

You may change the button type by scrolling through the values for Type. Available values: Load, Scene 1 through Scene 16, or Group. If you change between Load, Scene, or Group and press ▼, the screen changes to show parameters particular to that button type.

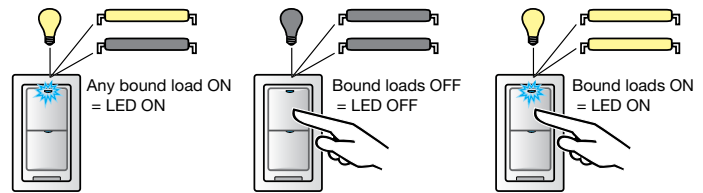
NOTE: The Rocker value will only appear for an actual rocker switch.

Mode

Mode options for Load buttons are Toggle, On-Only, Off-Only, and ToggleNT.

In On Only or Off Only mode, each button press only causes the associated action.

In Toggle mode, if there are multiple loads bound to a button and any load is ON, the LED will be lit. Pressing the button turns OFF all loads and the LED on the button turns OFF. Pressing the button again turns ON all loads bound to the button.



ToggleNT mode is intended for use when the button is assigned to a Group. For details on this mode, see the section on [“Group Button Parameters” on page 17](#).

Fade On, Fade Off

Fade On and Fade Off determines the time that it takes for loads bound to this button to reach the target level.

The fade time defaults are Use Load's. By default, all loads carry a two second ON and OFF fade time. Each button can be set for different fade times independently for the same loads, allowing fast or slow load fade, depending on the button pressed.

Fade time value options are from None (immediate) to 18 hours in duration. As you scroll through the values, the units of measure change from seconds to minutes to hours.

Loads

Select this option to open the **Assign Loads** screen. This will allow you select one or more loads to assign to the button. See [“Assign Loads” on page 17](#) for details.

Send

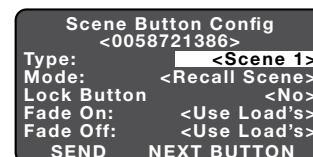
Select **SEND** point the LMCT-100-2 at the switch and press Select again. You return to the Button Config screen and can either configure another button or exit Button Configuration.

Next

Select **NEXT** to repeat the configuration process for the next button in the switch.

Important: If you make any changes to a button's settings, always choose **SEND** before going to the next button. New settings are not saved until sent to the button.

Scene Button Parameters



Type

You may change the button type by scrolling through the values for Type. Available values: Load, Scene 1 through Scene 16, or Group. If you change between Load, Scene, or Group and press ▼, the screen changes to show parameters particular to that button type.

NOTE: The Rocker value will only appear for an actual rocker switch.

Mode

Mode options for Scene buttons are:

- **Recall Scene** (default) – Each time the button is pressed turns ON the scene.
- **Scene Off** – Each time the button is pressed turns OFF the scene. Note: when Scene Off mode is set, the blue LED on the button is never lit.
- **Recall/OFF** – This is similar to a toggle function. Pressing the button once when the scene is not active recalls the scene; a subsequent button press while the scene is active turns OFF all members of the scene.

Lock Button

Lock Button options are Yes and No. If set to No, a user can set the current light level to a scene button by pressing and holding the button for 7 seconds. If set to Yes, this feature is locked and the user can't change the scene setting.

Fade On, Fade Off

Fade On and Fade Off determines how much time it takes for the loads to reach their target levels when this button is pressed.

The fade time defaults are Use Load's. By default, all loads in a scene carry a two second ON and OFF fade time. Each button can be set for different fade times independently for the same scene. Application: This feature allows the user to recall a scene quickly from one button, but from another button the scene recall is much slower and gradual.

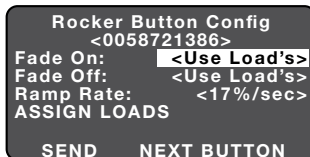
Fade time value options are from None (immediate) to 18 hours in duration. As you scroll through the values, the units of measure change from seconds to minutes to hours.

Send, Next Button

These function the same as for a load button.

Rocker Button Parameters

A rocker button, or paddle, is a specific type of load button. It cannot be changed to any other value.



Fade On, Fade Off

Fade On and Fade Off determines the time that it takes for loads bound to this rocker to reach the target level.

The fade time defaults are Use Load's. By default, all loads carry a two second ON and OFF fade time. Each rocker and button can be set for a different fade time independently for the same loads, allowing fast or slow load fade depending on the button or rocker used.

Fade time value options are from None (immediate) to 18 hours in duration. As you scroll through the values, the units of measure change from seconds to minutes to hours.

Ramp Rate

Ramp Rate determines the speed (or rate) at which the light level of bound loads increases or decreases when the top or bottom of the rocker is pressed and held. The default value is 17%/second which means that it takes approximately 6 seconds to ramp from 0–100%.

Loads

Select this option to open the **Assign Loads** screen. This will allow you select one or more loads to assign to the rocker . See [“Assign Loads” on page 17](#) for details.

Send, Next Button

These function the same as for a load button.

Group Button Parameters

If you select the Group for the Type, you can assign the button to a Network Group. For details on Network Groups, see [“Group Setup” on page 24](#).



Mode

By default, when the Type is Group, the Mode is set to ToggleNT. With this value, the button will toggle, but the LED will not track the actual settings of the loads. Additionally, the button will not track if another source such as a sensor turns the load ON. The reason for this is that the button can't track the status of all loads in the group.

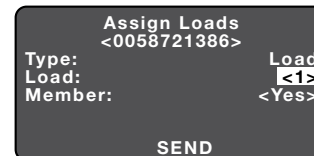
Group ID

The button is assigned to the specific group chosen here.

Send, Next Button

These function the same as for a load button.

Assign Loads



In this screen you choose one or more loads to be controlled by a button or rocker.

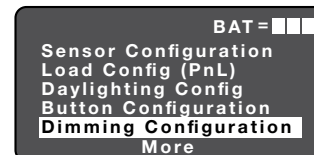
The **Load** parameter has possible values of 1–64, which is the maximum possible number of loads that can be assigned in a room or panel. All values are shown regardless of whether those loads exist in the room or panel, so care should be taken to make sure you are assigning only to existing loads.

After selecting a load, scroll to the **Member** parameter, to change whether that load will be controlled by the button or rocker.

Once all loads are configured. Select **SEND**, then press the same button you previously chose when entering the Button Configuration screen.

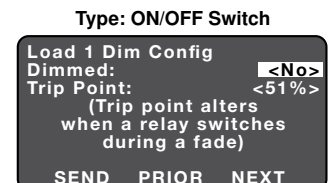
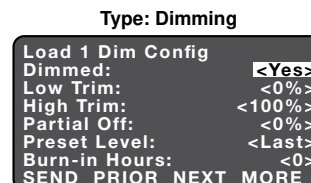
DIMMING CONFIGURATION

Dimming Configuration enables communication between the load and the LMCT-100. Use this function to change dimming parameters.



Load 1 quickly turns ON and OFF (or OFF and ON depending on its original state).

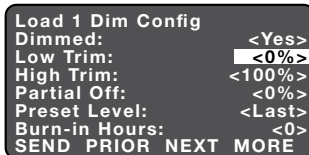
Based on the room controller type (Dim or Switch) one of the following screens displays for load 1.



Important: All loads connected to dimming capable room controllers default to **Dimmed: <Yes>**. Be sure to select the appropriate load type because these room controllers can control either type of load. Default settings are based on the load type selected.

NOTE: If you change the **Dimmed** parameter from Yes, to No, the display will not change to reflect the new parameters until you move the cursor to the next parameter.

Dimming Load Parameters



Low Trim

Entering a Low Trim value limits how low a load is allowed to dim. This overrides any other light level settings. The value options are 0–99% in 1% increments.

High Trim

Entering a High Trim value limits how high a load is allowed to dim. This overrides any other light level settings. The value options are 1–100% in 1% increments.

Partial Off

The amount the load goes to when turned off or all priority levels are relinquished (nulled out).

By default, it is 0, but for a dimming load if you set it to a higher amount you can specify a minimum level for the load. This is helpful when you want to keep the lights from turning completely off when a space is empty.

Preset Level

Entering a Preset value causes the lights to go to this light level each time they are turned on. By default, the value is set to Last, which turns the load on to its last used level. The value options are Last or 1–100% in 1% increments.

Burn-in Hours

This feature allows the user to burn-in, or season, all of the lamps associated with the load. This is most often done to fluorescent lamps to insure stabilization of the lamp and/or dimming compatibility.

The value options are 0, 12 or 100 hours. If 12 or 100 hours is entered, then the associated lights remain at 100% light level at any time they are turned ON until the number of hours have elapsed. The light may be turned ON or OFF as desired, however they do not respond to dimming during this time.

Send

To save the settings for the load, select **SEND** point the LMCT-100-2 at the switch and press Select again. You return to the Dim Config screen and can either configure another load or exit Dimming Configuration.

Prior

To configure the previous load, choose **PRIOR**. This is similar to **NEXT**, but chooses the previous load.

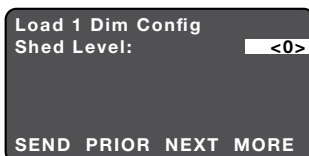
Next

Select **NEXT** to repeat the configuration process for the next button in the switch.

Important: After configuring a load, always choose **SEND** before going to the next load. New settings are not saved until sent to the load.

More

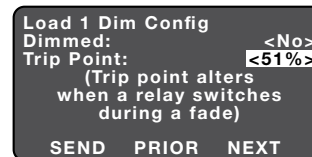
Select **MORE** to display an additional parameter, **Shed Level**



Shed Level

The maximum level the load will go to when it receives a Load Shed command. If the load is currently at a higher level, it will reduce to this amount. If it is currently at a lower level, it will remain at that level.

Switched Load Parameters



For a Switched load, the only parameter that is adjustable is the Trip Point. Even though the load is switched, it will still track values between 1% and 100%. The Trip Point determines at what point in a ramp or fade the load turns ON or OFF. The value options are 1%, 25%, 51%, 75%, or 100%. The default is 51%.

NOTE: For a room controller that does not support dimming, the **Type** will not be selectable and will specify a switched load only.

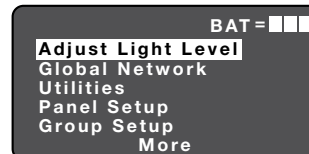
Send, Next, Prior

These options function the same as with dimming loads.

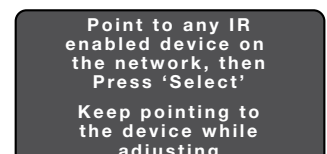
ADJUST LIGHT LEVEL

To access the Adjust Light Level option, select **More** when on the initial Home screen to view the Secondary home screen.

Adjust Light Level enables communication between the load and the LMCT-100. This feature allows a user to manually adjust the light level of a load without the need for a dimming switch or load button. This is particularly useful for setting scenes.



Press
Select



Press
Select



Keep pointing to the device while adjusting

Press the right or left arrow to select load. The selected load quickly turns ON and OFF.

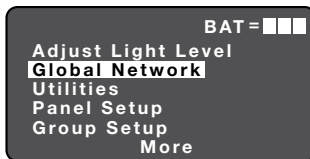
Press the up or down arrow to adjust light level

A quick tap on ▲ turns ON the selected load, a quick tap on ▼ turns OFF the load. Pressing and holding ▲ ramps the light level up, pressing and holding ▼ fades the light level down.

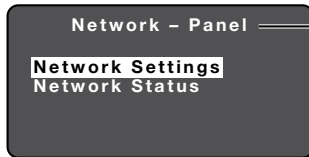
GLOBAL NETWORK

The Global Network option provides access to parameters used to customize settings related to communication over a BACnet network. BACnet communication requires use of network bridge such as an LMBC-300 or LMBC-600, an LMZC-301 zone controller, or an LMCP panel.

To access the Global Network option, select **More** when on the initial Home screen to view the Secondary home screen.

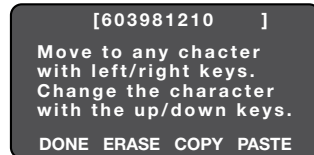


There are two options on the Network menu: **Network Settings** and **Network Status**.



This label will change, depending on whether communication is with a Panel or LMBC. The LMZC will display as a panel.

Network Settings



The top line of the screen shows the serial number of the panel.

Name

This is a label for the panel, useful when working with LMCS in a situation where multiple panels are used, to help more easily distinguish between the panels. Any numerals or letters can be used in naming the panel. By default, the name is the same as the serial number. Highlight the value and press Select to open a new screen, as shown above.

Select **ERASE** if you want to clear all characters before entering a new name. If you have several bridges or panels with a similar name, for example Room 101 and Room 102, you can **COPY** the name and then **PASTE** it when you configure the next bridge or panel. Select **DONE** to return to the **Network Settings** screen.

Device ID

The device ID is a unique number, between 0 and 4194302, that identifies a device in a BACnet network. Every device in the network must have a different number. By default, it is set to the last six digits of the serial number, but can be changed if needed, for example, when required by an integrator, as part of a BAS. To change, highlight the value and press Select.

AutoSet MSTP MAC

The MS/TP MAC address is an additional identifier, used by the devices on the network to communicate with each other. It is a number between 0 and 127. It is important to understand the difference between the device ID and the MS/TP MAC Address. The Device ID is, in essence, a number that identifies “who” the devices is, while the MS/TP MAC address identifies its relative location in the group of BACnet devices.

In a BACnet network, all the devices pass a token to each other to determine which device has control of communication over the network. The MS/TP MAC address is used to “locate” other devices. When a device receives the token, it will take control of the communication and send messages to other devices as needed. It then passes the token to the device with the **next highest** MS/TP MAC address. In order to do this, it sends an “Are you there?” message on the MAC address one higher than its own. If it receives a response, it passes the token. If it does not receive a response, it tries again on the next highest number, continuing in this manner until it receives a response. This “Are you there?” message is referred to as a Poll For Master.

NOTE: In order to send and respond to this Poll For Master message, a device must be designated as a master device. Other devices (slave devices) on the network will not respond, and cannot take control of the communication.

While the Device ID is fixed and should not change, the MS/TP MAC address can change as devices come on or drop off the network. By default, with **AutoSet MSTP MAC** set to “Yes”, the panel or bridge will automatically assign an MS/TP MAC address, shown in the **Auto MSTP MAC** parameter. When the panel or bridge is powered up, it will check the network for other devices to determine if its current MAC address is being used by another device. If not it will keep the same address, but if it is, and will assign an unused number between 32 and 127.

If you change **AutoSet MSTP MAC** to “No”, the parameter below changes to you **Manual MSTP MAC** and you can manually assign an MS/TP MAC address instead of having the panel or bridge automatically assign the number. This can be useful, especially in larger networks where response time is important. Since the Poll For Master message checks the next highest address number and then increments that number until it finds a device, having devices with gaps between numbers can increase latency. If you have 10 devices, numbered 0–9, you will have optimal performance since no time is wasted sending the Poll For Master message to an unused number.

Baud Rate

The default rate is 38400, but can be changed.

Max Master

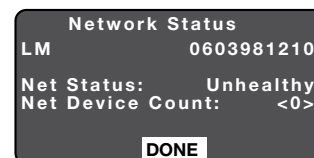
This is another parameter that will cut down on latency. The value you set for this parameter is the highest number the LMCP will check when sending a Poll For Master message, before returning to 0.

So, in the previous example, where there are 10 devices numbered 0–9, if you set the Max Master to 9, it will never check addresses 10–127.

NOTE: You should be aware that devices connected over the DLM Local Network also have MAC addresses for communication purposes, but that MAC address is entirely separate from the MS/TP MAC address.

If you make any changes, highlight **SEND** and press Select. Once again, point the LMCT-100-2 at an infrared sensor and press Select. You return to the **Global Network** screen. Or, if you aren’t making any changes, highlight **DONE** and press Select to return.

Network Status



The Network Status shows the communication “health” of the network and the number of devices currently found on the network.

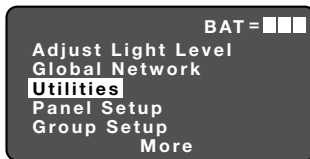
Network Status

This will display as “Unhealthy” if it can’t find the BACnet network, or if devices on network drop off and then reappear while the panel or bridge is polling the network (indicating connection problems). If devices show up consistently, or if they disappear and do not show up again (which would indicate the device was disabled or disconnected), the status will display as “Healthy”.

Net Device Count

This displays the number of devices on the BACnet network.

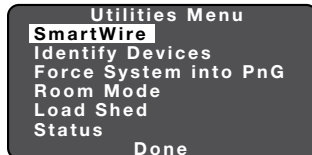
UTILITIES



Utilities provides access to several advanced features of DLM.

- The Smartwire process allows binding buttons and sensors to relays in a lighting control panel.
- Identify Devices is a means to extract service information from room devices.
- Forcing PnG restores the room to its original plug and go state.
- Room Mode allows the room to be forced into the after hours or normal hours mode for testing.
- Load Shed allows you to customize how loads respond to a Load Shed command via BACnet.
- Status provides several options for viewing the status of different devices in the DLM network

Smart Wire

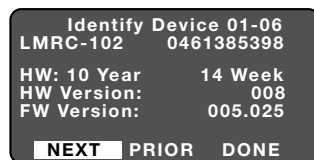
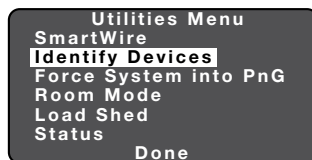


The Smartwire feature is used to configure LMSW buttons and DLM occupancy sensors to control relays in the LILM series Lighting Integrator panel.

With **Start Smartwire** selected, point the LMCT-100-2 at the switch or sensor to be programmed and press Select to enter the Smartwire mode. Select Stop Smartwire and point at the device to exit the Smartwire mode.

NOTE: The LILM panels are no longer sold, so this option is for legacy support only.

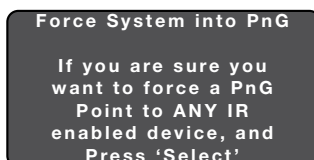
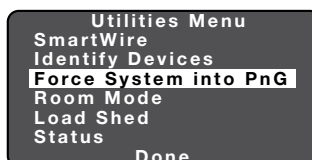
Identify Devices



Identify Devices provides access to service information for individual DLM devices in the room. Note that this feature only works with DLM room devices shipped after January 2012.

The room controller (or panel) assigns a number to each device when connection between devices is first established. The **NEXT** and **PRIOR** buttons will cycle through the devices in that order. The number in the upper right corner shows the device number and total number of devices. In the example above the room controller is device 1 of 6 in the local network. The room controller (or panel) will always be the first device.

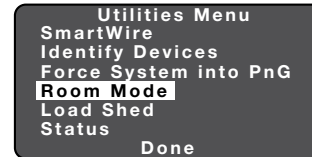
Force System into PnG



Forcing a PnG will reset the room devices back to their original

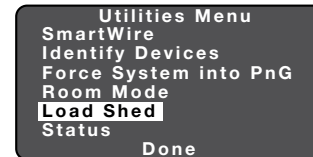
Plug and Go states and the room will immediately initiate a fresh Plug and Go sequence.

Room Mode

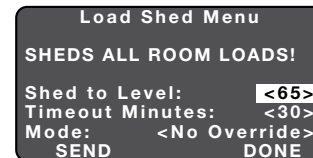


Room Mode will force the mode of the room into the After Hours or Normal Hours mode. Since sensor settings changed while in After Hours mode will apply only when the room is in that state, switching to After Hours mode will allow testing of the settings when a room is usually in Normal Hours. Be sure to return the room to the proper mode before exiting.

Load Shed



The Load Shed utility determines how the loads in the room will respond to a Load Shed command via BACnet.



Shed to Level

The maximum level the load will go to when it receives a Load Shed command. If the load is currently at a higher level, it will reduce to this amount. If it is currently at a lower level, it will remain at that level. Once the load shed is relinquished, the load will go to the level determined by the next highest priority. This could be the setting of a switch such as a scene switch, or the level set as part of a schedule.

Available values: 5% to 100%, in 5 % increments, and Load. If set to Load, the load will use the individual Shed to Level that can be set for a specific load. LMCS-100 software is required to access that parameter.

Timeout Minutes

This limits the amount of time after the Load Shed occurs before relinquishing the load shed. Available values are 5 to 250 minutes in 5 minute increments, and Off. If set to Off, the load shed is not relinquished until a command is received via BACnet to do so.

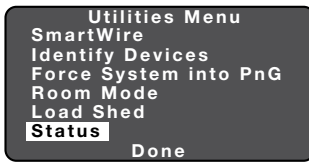
Mode

This parameter has three possible values:

- **No Override** – Initiates the load shed, but does not allow users to adjust the lighting levels
- **Override** – Initiates the load shed, but allows users to adjust the lighting levels
- **Disable** – Prevents the load from responding to the load shed command.

Once you have edited the parameters as needed, choose **SEND** and press Select, then point at an IR receiver and press Select again. To exit , press **DONE**.

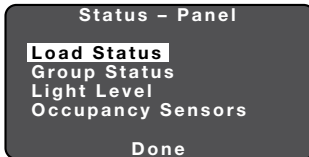
Status



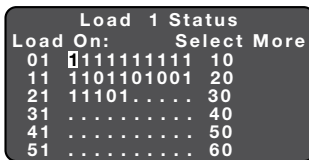
A panel or bridge is required to use this option. It provides status information on loads, groups, photosensors, and sensors connected to the panel or bridge.

An additional screen containing status information specific to panels is also available from the **Panel Setup** screen. See [“Panel Status” on page 24](#).

Load Status



This set of screens displays details about each load in the panel, as well as any loads in connected room controllers.

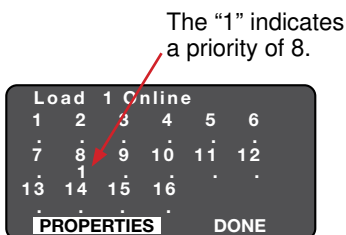


The first screen indicates the on/off status of each load. A value of “1” indicates it is ON. A value of “0” indicates it is OFF. A value of “.” indicates no load exists for that number.

The loads within the panel display first followed by loads from connected room controllers. In the example to the left, loads 1–24 are within the panel and load 25 is from an LMRC-101.

For additional details about the load, highlight that load and press Select to open the **Load x Online** screen. (If you try and select a number for which there is no load, nothing happens.)

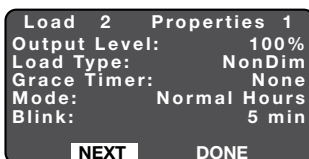
To return to the **Status** screen, scroll down past the bottom row (51–60). A second screen displays showing loads 21–64. Highlight **DONE** and press Select.



This screen displays the BACnet priority of the load DLM devices will typically have a priority of 8.

Select **PROPERTIES**. There are three Properties screens showing the current values for the load. Select **NEXT** to navigate to each screen, or press **DONE** to return to the **Status** screen.

NOTE: Most of these parameters are included in a group and are set by assigning the load to a group. LMCS-100 software can also be used to set these parameters.



Output Level

The current level of the load.

Load Type

This value is set within Load Configuration. See [“Load Configuration \(PnL\)” on page 6](#).

Grace Timer

This indicates whether the load is currently counting down between Normal Hours and After Hours, during the **Blink** period.

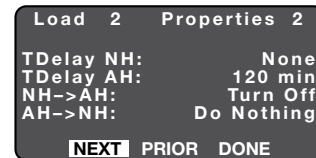
Mode

Indicates whether the load is currently in Normal Hours or After Hours.

Blink

Amount of minutes load stays ON, when a scheduled event occurs that switches the load OFF when transitioning from Normal Hours to After Hours. The relay will turn off and on once, then the Override LED for that relay will blink continuously for the time period. The LEDs for all switches bound to that group will also blink continuously. Pressing the button will keep the load ON and the time delay countdown will start. When the countdown reaches 0, the blink function re-occurs.

NOTE: **Blink** does not apply when transitioning from After Hours to Normal Hours.



TDelay NH

If a load is commanded to turn ON when the schedule switches to Normal Hours, the load will automatically turn OFF after the time delay expires. If the load is turned on manually by a switch after the schedule switches to Normal Hours, the load will again automatically turn OFF after the time delay expires.

TDelay AH

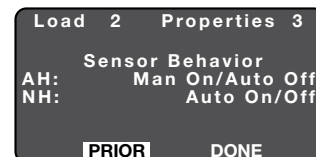
Identical to **TDelay NH**, but the behavior occurs when the schedule switches to After Hours. Works in conjunction with **Blink**.

AH->NH

Behavior of the relay when Normal Hours begins (turn ON, turn OFF, or do nothing)

NH->AH

Behavior of the relay when After Hours begins (turn ON, turn OFF, or do nothing)



Sensor Behavior: AH

Determines how the relay responds to sensor input during After Hours. Possible values are:

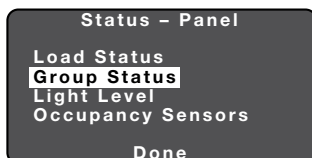
- Manual On/Auto Off – Responds to sensor input when vacancy is detected but not when occupancy is detected
- Auto On/Manual Off – Responds to sensor input when occupancy is detected but not when vacancy is detected
- Auto On/Off – Responds to sensor input for both occupancy and vacancy detection
- Do Nothing

Keep in mind that this determines whether the loads assigned to the group will respond to sensor input. It does not determine whether the loads will turn on or off. That is set within the sensor programming (either on the sensor itself, or by using **Sensor Configuration** option in the LMCT-100-2 or LMCS-100 software)

Sensor Behavior: NH

Determines how the relay responds to sensor input during Normal Hours. Possible values same as above.

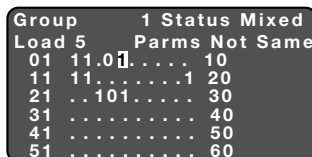
Group Status



This set of screens displays the loads that are assigned to the group, along with their current on/off state. Additionally, you can view the settings for the group. Finally, in cases where the setting of an individual load are different from the group settings, you can view the differences. This can be extremely helpful when trying to diagnose a situation in which a load is not responding as expected. Keep in mind that individual loads can be programmed with different values from the group but still be a member of the group.



Select the **Group** number that you want to display, then select **NEXT**. Point the LMCT-100-2 at any IR enabled device and press Select.

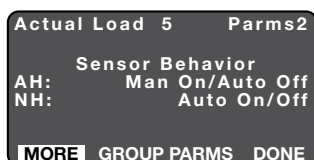
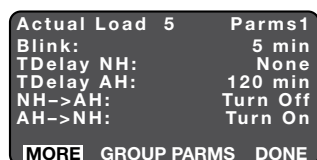


This screen indicates which loads are assigned to the group, along with the on/off status of each load. A value of "1" indicates it is ON. A value of "0" indicates it is OFF. A value of "." indicates the load is not assigned to the group.

On the top line, the **Status** will display "Off" if all assigned loads are off, "100%" if all loads are on and there is no dimming, and "Mixed" if some loads are on and others are off. If all loads in the group dim and are set to the same dimming amount, it will display that amount.

Move the cursor to highlight a specific load. If you scroll down below the line for 51–60, you will see loads 61–64.

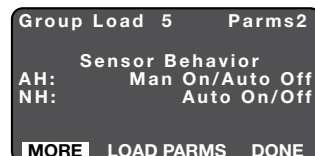
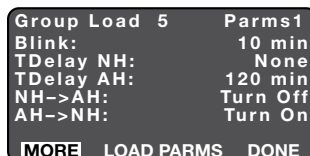
The load number will display in the second line. The **Params** parameter will say either "Same" if the load parameters match the group parameters, or "Not Same" if there is a difference. To view the difference, press Select to open the **Actual Load x Params 1** screen.



Selecting **MORE** toggles between the two screens of parameters. The screens display the values of the parameters assigned to the individual load. These parameters are also found on the Load

Status screens. See the previous section for a description of each.

To compare the values on this screen with the values for the group, select **GROUP PARAMS**.

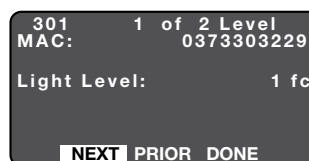


These screens display the values of the parameters assigned to the group.

In this example, if you compare the Blink parameter to the one on the Actual Load screen, you will see the group value is 10 minutes, while the individual load is 5 minutes.

Select **LOAD PARAMS** if you need to view the load parameters again. Once you finish comparing the values, select **DONE** to return to the **Status** screen.

Light Level

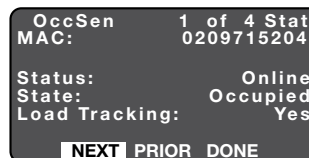


This screen displays the current light level, in foot candles, registered by an LMIO-301 with an attached photosensor.

The top line of the display shows the number of LMIO-301s connected to the network. The display shows the light level of a single device. The second line shows the serial number (**MAC** address) of the currently displayed device.

Select **NEXT** to view the light level of another photosensor. Or select **DONE** to return to the **Status** screen.

Occupancy Sensor Status



This screen display current values of occupancy sensors attached to the network.

The top line of the display shows the number of occupancy sensors connected to the network. The display shows the values for a single occupancy sensor. The second line shows the serial number (**MAC** address) of the currently displayed device.

Status

This indicates whether the sensor is currently found on the network. (When a sensor is connected, it is stored in memory until the panel is reset. So, if the sensor is disconnected and the panel has not been reset, the status will display "Offline".)

State

This indicates whether the sensor currently is set as occupied or unoccupied.

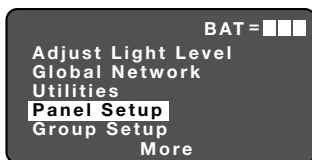
Load Tracking

If set to "Yes", loads bound to the sensor will respond, based on the programming settings for the sensor and group. If set to "No", then the loads will not respond to the sensor. This is used in situations where the panel is connected to a BAS or other BACnet device and you want to use the sensor to monitor occupancy/vacancy for purposes other than turning loads on or off.

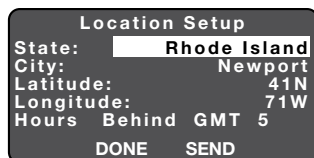
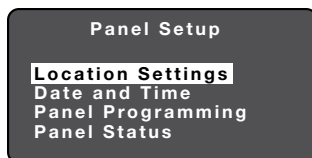
Select **NEXT** to view the values of additional sensors. Or select **DONE** to return to the **Status** screen.

PANEL SETUP

This option provides access to a number of sub-menus used for setup of the LMCP panel and the LMZC-301 Zone Controller.



Location Settings



Setting the panel location provides sunrise/sunset information to the panel, for use when you set a schedule according to an astronomical clock.

NOTE: The LMCT-100-2 has a limited number of locations to choose from. For a much more extensive list, use the LMCS-100 software to access this feature.

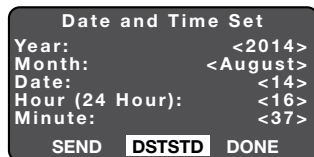
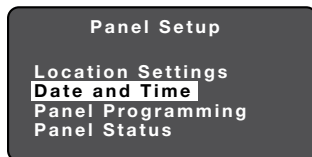
State and City

Select the **State** first and the available options for the **City** will change appropriately.

Once the **City** is selected, the **Latitude**, **Longitude**, and **Hours Behind GMT** will display automatically.

Select **SEND**. Once again, point the LMCT-100-2 at an infrared sensor and press Select. You return to the **Panel Setup** screen.

Date and Time

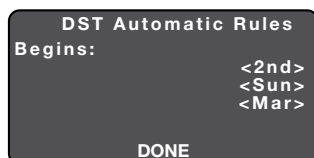
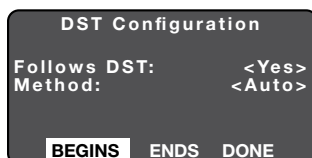


The date and time are used for schedules, including both manually set events and sunrise/sunset determination (in conjunction with the location settings).

Scroll to each field and set the value. An illegal date (for example, February 30) cannot be entered.

NOTE: There is no clock in the LMCT-100, so the time values will not change if you remain on this screen longer than a minute.

After selecting all values, scroll to **DSTSTD** and press Select.

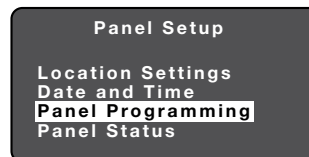


This screen determines if the panel will follow Daylight Savings Time. If you set **Follows DST** to "Yes", you can choose a value of "Auto" or "Manual" for **Method**. Select **BEGINS**.

NOTE: If you set **Follows DST** to "No", the **Method** field disappears. Highlight **DONE** and press Select, or press to return to the **Date and Time Set** screen.

Depending on whether you choose a value of Auto or Manual, the screen changes. For Auto, you select the week, the day of the week, and the month. For Manual, you select a specific date (for example, March 20th). Select **DONE** to return to the **DST Configuration** window. Repeat the process for the end of DST by pressing **ENDS**. Then select **DONE** to return to the **Date and Time Set** screen.

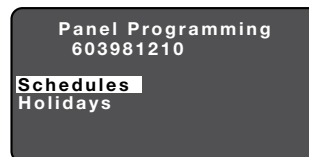
Panel Programming



The functions in this menu are used to define schedules, which consist of events that are used by Groups, to control groups of relays and room controllers. For details on Groups, see ["Group Setup" on page 24](#).

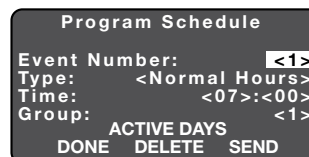
NOTE: While bridges can store group data, schedules are specific to panels. So you can set up groups within a panel and a bridge, and then have the panel send schedule events to both its internal groups and an external bridge.

Schedules



Select **Schedules**, point the LMCT-100-2 at the infrared sensor on the LMRD board and press Select to open the **Program Schedule** screen.

On this set of screens, you assign an event to a group, and set one action for that event. For each event, you specify the time the event occurs. You also specify whether the event will occur on a per day basis. Additionally, you specify whether the event will occur on any day designated as a holiday.



Event Number

You can schedule up to 254 date and time based events per panel. Each event is assigned to a group, and determines one action for the group. For each event, you specify the time the event occurs. You also specify the days of the week in which the event will occur. Additionally, you specify whether the event will occur on any day designated as a holiday.

Type

This determines the action for the event. Possible values:

- After Hours – Transitions Groups to After Hours (unoccupied) state
- Normal Hours – Transitions Groups to Normal Hours (occupied) state
- On – Turns group loads ON without changing the current occupancy status
- Off – Turns group loads OFF without changing the current occupancy status
- Do Nothing – No action

Time

Time the event will occur

Group

Group the event is assigned to

Select **ACTIVE DAYS**

Schedule Active On

Mon: <Y>	Tue: <Y>
Wed: <Y>	Thu: <Y>
Fri: <Y>	Sat: <N>
Sun: <N>	Holiday: <N>

DONE

For each day of the week, select whether the event will be active (Yes or No). Additionally, select whether the event will be active on holidays. (You determine which days are holidays in the **Holidays** screen.)

Select **DONE** to return to the **Program Schedule** screen.

Select **SEND**. Point the LMCT-100-2 at the infrared sensor on the LMRD board and press Select. You return to the **Program Schedule** screen, where you can program the next event.

When finished, select **DONE** to return to the **Panel Programming** screen.

The **DELETE** command will delete the current event from memory.

Holidays

Panel Programming
603981210

Schedules
Holidays

On this screen, you determine which days are designated as holidays. There are 99 locations in memory to store individual holiday parameters

Holiday Setup

Holiday: <1>
Year: <2014>
Month: <Jul>
Date: <4>
Duration: <1 day>

DONE DELETE SEND

For the **Holiday** parameter, select the memory location to store the information. Then select the date for the holiday and **Duration**.

Select **SEND**. Point the LMCT-100-2 at the infrared sensor on the LMRD board and press Select. You return to the **Holiday Setup** screen, where you can program the next event

When finished, Select **DONE** to return to the **Panel Programming** screen.

Panel Status

Panel Setup

Location Settings
Date and Time
Panel Programming
Panel Status

Panel Status
Nov 10, 2014 Mon
15:19 STD Non-Holiday
Sunrise: 06:14
Sunset: 16:47
Con LEDs: 00000000
Dip Switch: 00000000

DONE

Most fields on this screen are self explanatory. A value of "STD" indicates standard time and a value of "DST" indicates daylight savings time

For the Dip Switch field, a value of 1 indicates that particular dip switch is set to ON. For details on what each dip switch controls, see the LMCP User Guide..

The Con LEDs field indicates errors, and will show "1" in individual digits when the Config LED is lit solid and not blinking. From left to right, the error categories are as follows:

- 1st and 2nd digits – not used
- 3rd digit – RTCLOCK
- 4th digit – EEPROM
- 5th digit – Bootload
- 6th digit – Power
- 7th digit – DLM Local Network
- 8th digit – Relay

Press Select to return to the **Status** screen

GROUP SETUP

The options on this screen are used to define groups by assigning loads to them, and then define occupancy sensor behavior and assign dark/light events for those groups.

BAT = ■■■

Adjust Light Level
Global Network
Utilities
Panel Setup
Group Setup
More

WARNING:
LMBC or Panel must
be connected
To access
Group Setup
Press 'Select'
to proceed

After selecting **Group Setup**, a warning appears, explaining that a bridge or panel is needed for this functionality. Press Select, then point the LMCT-100-2 at any IR enabled device and press Select again.

Group Loads

Group Setup - LMBC

Group Loads
Group Occ Sensors
Group Dark/Light

DONE

On this set of screens, you assign loads to groups and customize the behavior of those groups.

Group Setup

Group: <1>
Type: <SensAutomatic>

LOADS CUSTOM
DONE DELETE SEND

Group

Select the group number. Each panel has 99 memory locations for storing group parameters and each bridge has 16 locations.

Type

Select one of the predefined macros (see below) or select "Custom" to define the group behavior parameters.

Next, Select **LOADS**. Point the LMCT-100-2 at the infrared sensor on the LMRD board and press Select to open the **Group x Loads** screen.

Predefined Macros:

- **Manual** – This macro should be used when there are no occupancy sensors or switches associated with the Group and only on/off actions from schedules or dark/light are intended. Since On/Off changes are based only on schedules and dark/light sensors, the only parameter in the macro that has any effect is Blink, which will provide a warning to occupants by momentarily shutting the load off and then back on.
- **Override Time AH** – This macro is designed for situations where only switches are used (no occupancy sensors). An override time delay is set so that if a switch is used to keep the light on during after hours, the load turns off after two hours. The load is set to turn ON when entering Normal Hours. If you instead want to require that the load

be manually turned on, start with this macro when creating the group, select CUSTOM, and modify the **Transition AH > NH** action to a value of "Do Nothing." Additionally, adjust **Time Delay AH** if you want a different amount of time before the load turns off.

NOTE: The settings in this macro are used for Groups 1–8, when you use Smartwire to assign relays to a group.

- **Sensor Day Disable** – For use with occupancy sensors, this macro turns all loads ON during Normal Hours; they can be turned off or back on manually, with no override time delay. When After Hours begins, loads are turned OFF and sensor functionality is set to Auto On/Off. A two hour time delay is set for cases in which some loads in the group are not bound to sensors, but only to switches.
- **Sensor Man-On NH** – In this macro, relays are left OFF when Normal Hours begins. Occupancy sensors trigger loads on occupant arrival, but do not time out until after hours. When After Hours begins, loads turn OFF and sensors switch to Auto On/Off. As with the Sensor Day Disable macro, a two hour time delay is set for cases in which some loads in the group are not bound to sensors, but only to switches.
- **Sensor Auto** – This macro sets sensors to Auto On/Off for both Normal Hours and After Hours operation, so loads turn ON only based on sensor or switch input. A 120 minute override time delay is used during the After Hours period. This allows for consistent functionality in response to sensors at all times, while accommodating the inclusion of relays not bound to sensors that share the same operational time window.
- **Auto Switch-1xx** – This macro is designed to work with the AS-100 Automatic Control Switch. The AS-100 is a switch that controls the line voltage (instead of sending a low voltage control message to the panel or other room controller). Instead, the AS-100 responds to timed power interrupt signals coming from a relay in the panel, providing automatic shutoff with a blink warning when transitioning between normal hours and after hours. Other timed interrupt signals can turn the power on or off. You assign a relay to "AS-100" mode using LMCS-100 software or on the Load Config (PnL) menu in the LMCT-100. All relays in "AS-100 mode" remain closed except for the timed interrupts. If this macro is assigned to a group, you should only assign relays in "AS-100" mode to that group. When using this Macro, none of the seven group parameters apply. (Although Blink is set to 5 minutes, the blink time is actually controlled by the AS-100, not the LMCP.)

NOTE: Since selecting this mode puts all relays in the associated group into "AS-100" mode, you should not assign those relays to another group set to a different macro.

For more details on macros, refer to the LMCP User Guide.

To assign various loads to the group, scroll through each **Load** number and select whether that load is a **Member** of that group. When complete, select **DONE** to return to the **Group Setup** screen. Then select **SEND** to store the load assignments for that group in the panel or bridge. Point the LMCT-100-2 at any infrared sensor and press Select. You return to the **Group Setup** screen, where you can program the next group.

Important: You must **SEND** the settings for a group before selecting another group, or those settings will be lost.

When finished, highlight **DONE** and press Select to return to the **Panel Programming** screen.

Using the Smartwire Feature

You also select have the option of using the Smartwire function instead of manually scrolling through the loads. To do this, select **SMARTWIRE**.

Point the LMCT-100-2 at any infrared sensor.

Once you enter Smartwire mode, you can use the Load buttons on the panel to assign the loads to the group. See the Smartwire section in the LMCP User Guide for details. Once finished, select **DONE** to return to the **Group Setup** screen.

NOTE: While the Smartwire option is available for bridges as well as panels, it is less practical for bridges as it requires you to have easy access to each room controller so you can press the relay switches for individual loads on the room controller.

Defining Custom Group Parameters

If you select a value of "Custom" for **Type** on the **Group Setup** screen, then you must select the **CUSTOM** option on that screen, which opens the **Group x Custom Parms** screen, which contains the first five of the seven programmable parameters.

Select **NEXT** to access the remaining two parameters.

Blink

Amount of minutes load stays ON, when a scheduled event occurs that switches the load OFF when transitioning from Normal Hours to After Hours. The relay will turn off and on once, then the Override LED for that relay will blink continuously for the time period. The LEDs for all switches bound to that group will also blink continuously. Pressing the button will keep the load ON and the time delay countdown will start. When the countdown reaches 0, the blink function re-occurs.

NOTE: **Blink** does not apply when transitioning from After Hours to Normal Hours.

Time Delay NH

If a load is commanded to turn ON when the schedule switches to Normal Hours, the load will automatically turn OFF after the time delay expires. If the load is turned on manually by a switch after the schedule switches to Normal Hours, the load will again automatically turn OFF after the time delay expires.

Time Delay AH

Identical to **Time Delay NH**, but the behavior occurs when the schedule switches to After Hours. Works in conjunction with **Blink**.

AH->NH

Behavior of the relay when Normal Hours begins (turn ON, turn OFF, or do nothing)

NH->AH

Behavior of the relay when After Hours begins (turn ON, turn OFF, or do nothing)

Sensor Behavior: AH

Determines how the relay responds to sensor input during After Hours. Possible values are:

- Manual On/Auto Off – Responds to sensor input when vacancy is detected but not when occupancy is detected
- Auto On/Manual Off – Responds to sensor input when occupancy is detected but not when vacancy is detected
- Auto On/Off – Responds to sensor input for both occupancy and vacancy detection
- Do Nothing

Keep in mind that this determines whether the loads assigned to the group will respond to sensor input. It does not determine whether the loads will turn on or off. That is set within the sensor programming (either on the sensor itself, or by using **Sensor Configuration** option in the LMCT-100-2 or LMCS-100 software)

Sensor Behavior: NH

Determines how the relay responds to sensor input during Normal Hours. Possible values same as above.

After setting the last two parameters, select **DONE** to return to the **Group Setup** screen.

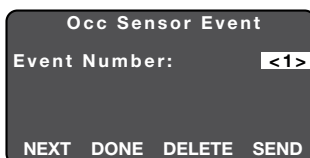
Group Occupancy Sensor Settings



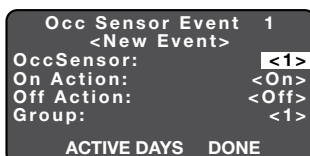
On this set of screens, you assign individual events that determine whether loads assigned to a group will turn on or off, based on input from an occupancy sensor.

NOTE: If using multiple occupancy sensors, when programming with the LMCT-100, you should only assign ONE sensor input to a group. Assigning more than one sensor to a group will lead to inconsistent response (but you can assign different sensors to different groups). If you need to assign multiple sensors to a group, use the LMCS software to program the actions. The LMCS software has additional capabilities for programming input from multiple sensors.

After selecting this option, point the LMCT-100-2 at an IR sensor and press Select to open the **Occ Sensor Event** screen.



Select the **Event** number in which to store the occupancy sensor event. You can program up to 99 separate occupancy sensor events, and each event is assigned to a group. Then select **NEXT** to open the **Occ Sensor Event x** screen.

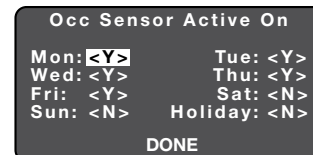


Select the number of the **Occ Sensor** assigned to the event. Sensor numbers are automatically assigned based on serial number with the highest number set to 1, next highest set to 2, etc.

Set the **On Action** (sensor detects occupancy) and **Off Action** (sensor detects vacancy). For each action, the loads in the group can be set to turn ON, turn OFF, or do nothing).

NOTE: Whether the load responds to the sensor message is determined by the two sensor related parameters that are part of the group. So, for example, if Sensor NH is set to Manual On/Auto Off, the load will respond to the **Off Action** but not the **On Action** during Normal Hours.

Set the **Group** that the event is assigned to. Then, select **ACTIVE DAYS**.



For each day of the week, select whether response to sensor input will be active (Yes or No). Additionally, select whether the event will be active on holidays. (You determine which days are holidays in the **Holidays** screen. See [“Holidays” on page 24.](#))

Select **DONE** to return to the **Occ Sensor Event x** screen. Then select **DONE** again to return to the **Occ Sensor Event** screen.

Select **SEND** to store the event settings in the panel or bridge. Point the LMCT-100-2 at any infrared sensor press Select. You return to the **Group Setup** screen.

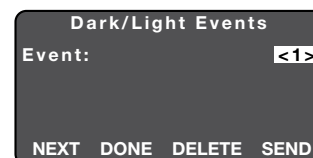
Important: You must **SEND** the settings for an event before selecting another event, or those settings will be lost.

Group Dark/Light Events



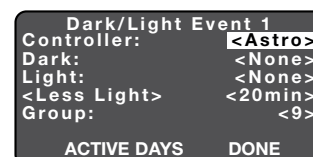
On this set of screens, you assign individual dark/light events based on sunrise/sunset settings or on dark/light triggers from a photo sensor connected to an LMIO-301.

After selecting this option, point the LMCT-100-2 at an IR sensor and press Select to open the **Dark/Light Events** screen.



Select the **Event** number in which to store the dark/light event. You can program up to 32 separate dark/light events, and each event is assigned to a group. Then select **NEXT** to open the **Dark/Light Event x** screen.

Astro Events



This screen changes depending on the value of the **Controller** parameter. By default, this is set to “Astro”. In this case, the dark and light events are determined by sunrise and sunset, which is dependent on the values you set on the **Location Setup** screen.

For the **Dark** and **Light** parameters, the value determines the action triggered by a dark or light event. Actions will affect all loads that are part of the selected Network Group:

- 0% through 100% – Set the load to the specified amount.
- LNZ – Set the load to the last non-zero level.
- Do Nothing – No change to the load.
- NH Override – Set the load to Normal Hours. All settings for Normal Hours within the group (programmed from within the Group Loads screen) will be applied.
- AH Override – Set the load to After Hours. All settings for After Hours within the group (programmed from within the Group Loads screen) will be applied.
- Normal Hrs – Set the load to Normal Hours. All Normal Hours settings for loads and sensors will be applied.
- After Hrs – Set the load to After Hours. All After Hours settings for loads and sensors will be applied.
- Turn Off – Set the load to a value of 0. This turns the load OFF.

The next parameter can be set to “**More Light**” or “**Less Light**”. This parameter, in conjunction with the following Time parameter, determines when the event will be triggered in relation to the actual sunrise and sunset time. More/Less light refers to the amount of “daytime”/“nighttime”. The time parameter can be selected in two minutes increments, and is equally divided between before and after the actual sunrise/sunset time. The **More Light** parameter acts as if the time between sunrise and sunset was longer (more daytime), and **Less Light** acts as if there were less time between sunrise and sunset (less daytime). So if you select Less Light with a time value of 20 minutes, the Dark event will trigger 10 minutes **before** sunset and the Light event will trigger 10 minutes **after** sunrise. The LMCP User Guide contains a chart shows this example in greater detail.

Finally, you assign a **Group** for this event, to control the relays belonging to that group.

LMIO-301 Events

If you change the **Controller** parameter to one of the “LMIO-301” values, dark light events are instead triggered by photocell sensor input. Although multiple LMIO-301s may be connected to the network, only a single one can be programmed using the LMCT-100. The LMIO-301 with the highest serial number will be used. However, you can program separate events for different LMIO-301s by using LMCS-100 software.

Once you select a value and scroll down to the next parameter, the screen changes. Two new parameters are displayed below **Dark** and **Light**.

The **Setpoint** is the amount of foot candles that will determine when the Dark and Light events are triggered. (When the light becomes brighter than the Setpoint, it triggers the Light event, and when it becomes darker, it triggers the Dark event.)

The **Delay** parameter sets the amount of time after the Setpoint is reached that the event is actually triggered. This helps prevent unwanted event triggering, for example, when the light temporarily gets darker because of a cloud passing over the sun.

Once you have set the parameters on the **Dark/Light Event x** screen, select **ACTIVE DAYS**.

For each day of the week, select whether response to sensor input will be active (Yes or No). Additionally, select whether the event will be active on holidays. (You determine which days are holidays in the **Holidays** screen. See “[Holidays](#)” on page 24.)

Select **DONE** to return to the **Dark/Light Event x** screen. Then select **DONE** again to return to the **Dark/Light Event** screen.

Select **SEND** to store the event settings in the panel or bridge. Point the LMCT-100-2 at any infrared sensor press Select. You return to the **Group Setup** screen.

Important: You must **SEND** the settings for an event before selecting another event, or those settings will be lost.

TROUBLESHOOTING

Problem: Display doesn’t come on when I press the Power On button.

1. Make sure batteries are installed correctly.
2. Make sure batteries are good.

Problem: Error message when the LMCT-100-2 requires a response from a device.

Press Select to return to the Home menu, then re-select the menu function.

Problem: If the LMCT-100-2 still can’t get a response from the device:

1. Point to the device and try again.
2. Make sure you are pointing at the correct type of device.
3. Make sure the device is within range.
4. Make sure the device you are pointing at is powered and connected to the DLM Local Network.
5. Make sure the device is IR equipped.
6. Make sure the IR lenses on the device and the LMCT-100-2 are clean.
7. Check batteries.

Problem: A parameter value field shows <????>.

Explanation: If <????> appears in any value field, the current setting is invalid. Adjust the setting to one of the valid options.

For other questions concerning versions, contact Technical Support.

Problem: An “AH” appears in the upper right corner on the menu title line. For example:

Explanation: There are two sets of parameters in every device, one for normal hours, which is the default configuration, and one for After Hours. “AH” is a flag that appears on a screen if the device that the LMCT-100-2 is communicating with is in After Hours mode.

If this indicator does not appear then the device or load is in Normal Hours.

Parameters changed while in one of these modes will be changed for that mode only.

After Hours parameters are only available in network systems where a Segment Manager is used to set After Hours schedules for a load or device.

LMLS-400 / LMLS-500 Daylighting Control

Problem: Lights do not switch or dim when desired, under daylighting control.

1. Use the pushbutton on the photosensor to manually test load control.
2. Quick press to cycle through the load binding verification test. Press and hold for two seconds to start automatic calibration (first, relinquish load binding verification).
3. If the lights do not switch on and off, check Zone Setup to rebind the loads.
4. If the lights do switch on and off, use the Zone Settings screen to verify that the On and Off setpoints are correct (if Switched / Bi-Level / Tri-Level) or Day and Night setpoints are correct (if Dimmed). Place the photosensor in Test Mode to quickly verify daylighting operation; shine a flashlight into the sensor, or cover the sensor, to simulate major light level changes.

Problem: Red LED is ON, not flashing

Explanation: There is an internal failure in the LMLS sensor. Try unplugging the sensor from the DLM network, then plug it back in and wait for ten seconds. If the red LED comes back on, and is not flashing, the sensor is defective and must be replaced.

Problem: Red LED is flashing ON for three seconds, OFF for one second (repeating).

Explanation: The LMLS sensor is in Control Mode <Disable>. Use the LMCT-100-2 to change the Control Mode parameter to <Normal> to resume daylighting operation.

Problem: Blue LED is flashing

Explanation: If the blink is slow (one flash every four seconds), the photosensor is in an override condition, either due to an override from a wall switch or due to an automatic or manual commissioning operation.

If the latter, complete the commissioning operation first; otherwise, use a wall switch to turn off the controlled loads to terminate the override.

Explanation: If the blink is faster (one flash every second), the photosensor is in Test Mode or Demo Mode.

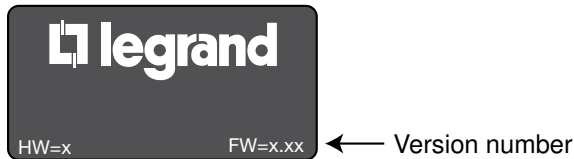
1. Test Mode will cancel automatically after five minutes.
2. Alternatively, it can be turned off by selecting the Control Mode menu from the LMLS-400/LMLS-500 main screen in the LMCT-100.

APPENDIX – UPDATING THE FIRMWARE IN THE LMCT-100-2

The firmware in the LMCT-100-2 can be updated, via the micro-USB jack found within the battery compartment. This provides the ability to support new DLM devices released after the LMCT-100-2 or updates to the capabilities of the various existing DLM devices.

The firmware version of the LMCT-100-2 is displayed on the start-up screen when the unit is first powered on.

Start-up Screen



You will need three things to update the firmware—a PC running Windows, a USB to micro-USB cable, and DfuSE Demo software, available from STMicroelectronics.

Downloading and Installing DfuSe Software

Download the software from the following web page: <http://www.st.com/en/development-tools/stsw-stm32080.html>. There is no cost to download the software though you will need to register it.

Be sure to read the section in the User Manual, downloadable from the same web page, on installing the driver. If the driver is not properly installed, you will not be able to upgrade the firmware but there will be no error message saying that the driver is missing.

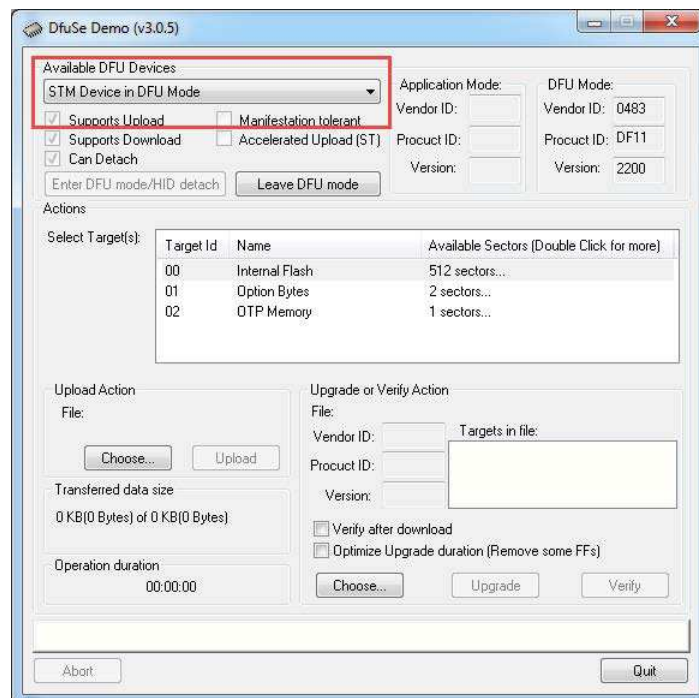
Installing Firmware in the LMCT-100-2

Wattstopper support can provide information how to download a copy of the most recent firmware. Once that file is saved on your computer, take the following steps to install the file.

1. Remove the battery cover from the LMCT-100-2 to expose the micro-USB jack. **Leave the batteries installed** in the LMCT-100-2.
2. Plug the cable into the LMCT-100-2 and the other end into the PC.
3. Start the DfuSe Demo software.
4. Press the POWER button on the PCBA.
5. The display on the LMCT-100-2 will **not** light up.
6. Under the **Available DFU Devices** drop-down, select “STM Device in DFU Mode”. (It may automatically be selected.)

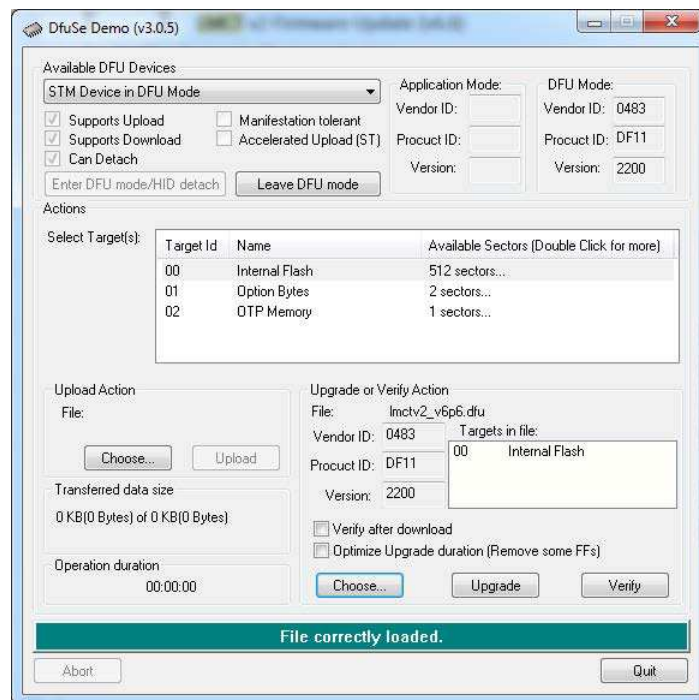
If no options are available from the drop-down, this indicates that the DfuSE driver is not proper installed. See step 2 in the section on installing the software in the DfuSe User Manual for details.

DfuSe Window with Stm Device Selected



7. Click **Browse**, navigate to the folder where you have saved the firmware file, and select the new firmware file. The software checks the file and if it is correct, the Status bar at the bottom displays “File loaded correctly”.

DfuSe Window after Firmware Upgrade File Selected



8. Click **Upgrade**. The status bar will show the progress of the update and indicates when the update is complete. The entire process takes a couple of minutes.
9. Once the update is complete, unplug the cable.
10. **Remove the batteries from the LMCT-100-2** and wait for a few seconds, then reinstall the batteries.
11. Press the power button on the LMCT-100-2. The display will show the new version number in the initial startup screen.

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