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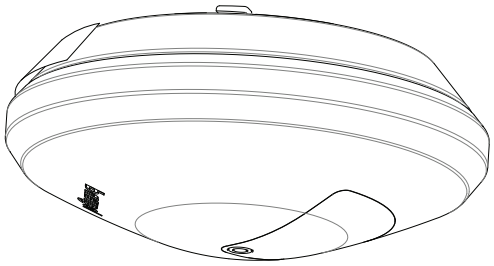
LMDL-600
DLM Wireless Photosensor with IPv6/Bluetooth® Low Energy Technology
User Guide

No: 30561 –06/20 rev. 1



INTRODUCTION

Understanding the capabilities of Wireless Digital Lighting Management (DLM) photosensors and how to configure the sensors for the desired control strategy is one of the keys to successfully commissioning daylighting-controlled projects. This user guide describes typical sequences of operation and calibration techniques for the LMDL-600 (Wireless Digital Daylighting Photosensor) and explains how to change zone and sensor parameters in order to modify the sequence of operation.

Please note that all DLM jobs with LMDL photosensors must be submitted to WattStopper Application Design for review.

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IMPORTANT CONSIDERATIONS AND BEST PRACTICES

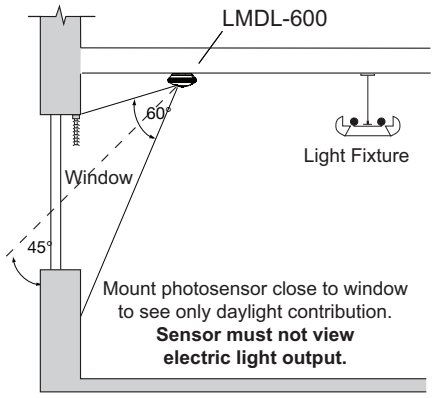
- You **must** carry out the calibration process for the LMDL-600 to have daylighting functionality. Simply pairing the LMDL-600 to wireless LMRC-611X room controllers will not enable daylighting.
- Required versions: LMCS-100 v 4.8.0 or later, DLM Conifg App v 1.1.16 or later, LMDL-600 Fw version 10.26 or later
- Calibration must be completed by either using the DLM Config App (Available on the Google Play store or the Apple App Store) or the LMCS-100 software (Available from the Wattstopper web page).
- The DLM Config APP and LMCS require an authorized account to login. New users can request an account at first login.
- Calibration can only be performed on secured rooms (paired wireless room controllers, switches, sensors). Securing of rooms can be performed using LMCS and the DLM Config app.
- The LMDL must be **awake** during calibration. The LMDL undergoes “sleep” patterns to conserve battery. Please press the LMDL-600 face (config button) once to wake it up for 5 minutes.
- The LMDL-600 only works with fully wireless DLM rooms. It cannot control a wired DLM load even when enabled with a wireless LMBC-650 (Wireless Bridge Controller)
- Do not calibrate if the LMDL sensor is reading less than 5 footcandles (fc) of daylight.
- Ensure the battery tab sticker is pulled in order to power the LMDL-600.
- The LMDL should be installed in a way that only ambient daylight is seen by the photosensor lens. Electric light contribution will affect accuracy of the device.
- A good quality Light Meter is REQUIRED. (Not included with any DLM device).
- The LMDL does not do bi-level and tri-level dimming.

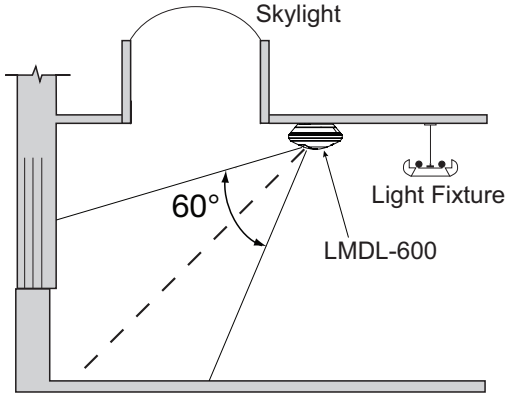
FEATURES AND PLACEMENT

Mounting

The LMDL-600 switches or dims electric light in response to daylight. It is important to select a location where the photosensor measures daylight contribution only. For proper operation the photosensor should not see any electric light contribution. When the primary source of daylight is a window (side-lighting), the LMDL-600 is typically ceiling mounted between one to three feet away from the window.

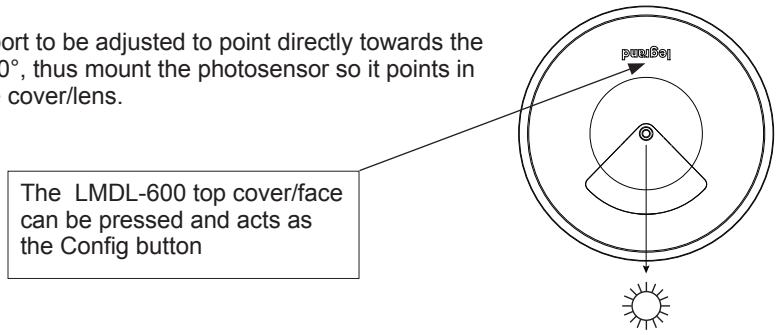
NOTE: Ensure that the sensor is never pointed directly towards the sky of the skylight as this may exceed the 1500 fc capability.





Lens adjustment

The LMDL-600 has a rotating cover which allows the daylight port to be adjusted to point directly towards the window or skylight. The cover can be rotated approximately 170°, thus mount the photosensor so it points in the general direction of the window/skylight and then adjust the cover/lens.



After Mounting and Lens Adjustment are Complete

Once installed correctly, you are now ready to pair and calibrate. However, if the LMDL-600 has been previously paired, you will need to reset it first.

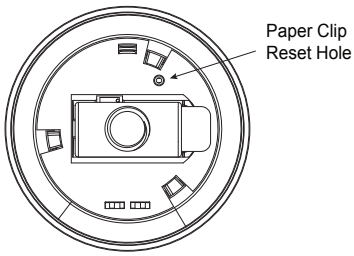
NOTE: The LMDL-600 does not have Plug n Go functionality. Push n Learn is also not available for use. You must use either LMCS or the DLM Configuration App to calibrate the sensor and select the specific loads it will bind to.

Resetting the Devices

When you reset the LMDL-600, the Channel and Network ID will return to their default values, and if the switch was previously paired, it will no longer be connected to that room network. All DLM parameters are also returned to their default values.

There are two ways to reset the LMDL-600:

- Press the face (Config button) 10 times. The LED will blink green each time the Config button is pressed. After the 10th press, the LED will turn red then briefly turn white indicating it is rebooting.
- On the back of the sensor, is a small hole that will fit a paper clip. Use a paper clip to depress the button inside that hole and hold for 10 seconds. When you first press the reset button, the LED will blink red once, then after the 10 second will reboot and the LED will briefly turn white, indicating it is rebooting.



NOTE: You can also reset the LMDL-600 from the DLM Config App or LMCS (the LMDL-600 must be woken up before resetting).

PAIRING THE LMDL-600

You can pair the LMDL with Wireless DLM room devices with 3 different methods:

NOTE: If you are going to use LMCS to calibrate the LMDL-600, you must also use LMCS to pair the devices. You cannot discover and bring the LMDL-600 into an LMCS project if it was originally paired using Push to Pair or the DLM Config App. If the LMDL-600 was already paired using one of these two methods, you must reset it and then discover and pair with LMCS.

- **Push to Pair (PtP)** – Locate an appropriate LMRC-611X wireless room controller and press the CONFIG button on the device 3x until the green LEDs begin to flash. Press the appropriate LMDL face/config button 3x to pair. Press the LMDL config button once more (after 3 seconds). This will turn the paired load off/on. Press the LMRC config button 3x to exit PtP pairing.

- **DLM Config App** – In order to calibrate with the. DLM Config App, the LMDL-600 must be paired as part of a secured site. So the best way to pair is to use the Site-based pairing function. Although it is possible to use the “Quick Pair” function in the DLM Config App, you must then add the room network to a secured site before proceeding with calibration.

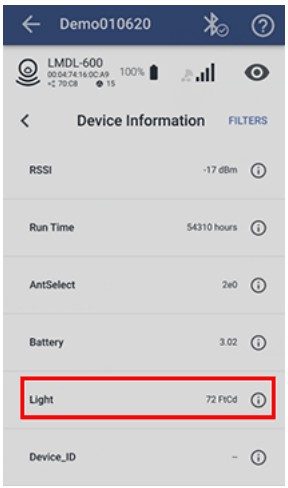
  To create a new room network, select the “Default” network and the LMRC-611X that you would like to begin with. After a connection has been established, tap the **Create New Network** option and **Add Device to Network**. Next, select the devices to add and press the green circle to create the room network. If your room network is already created and you would like to add an LMDL-600, select the appropriate room network and an LMRC-611X within that network. Once a connection has been established, tap **Edit Network** and **Add Device to Network**. Select the appropriate LMDL-600 (ensure it is **awake** by pressing the device face) and press the green circle to add the LMDL-600 to the room network.
- **LMCS-100** – Use the device discovery process offered within LMCS to create your network(s), pair each of the devices, and place them in to their respective rooms. This process can also be used to add an LMDL after the network has already been commissioned and secured.

CALIBRATION WITH THE DLM CONFIGURATION APP

See the DLM Configuration App User Guide for further details on using the DLM Config App. It can be downloaded from:
https://www.legrand.us/-/media/brands/wattstopper/resources/user-guides/ws-user-guide-dlmconfigapp.ashx

Pre-Calibration Requirements

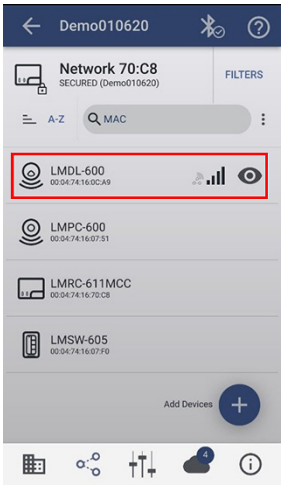
- Ensure the devices on the network have been added to a room within a site.
- Ensure you have a good quality 3rd party Light Meter (Wattstopper does not sell light meters).
- **Ensure that the LMDL-600 is seeing more than 5Fc before proceeding with calibration.** You can check the current reading by selecting the appropriate LMDL-600 → Device Information → Light.

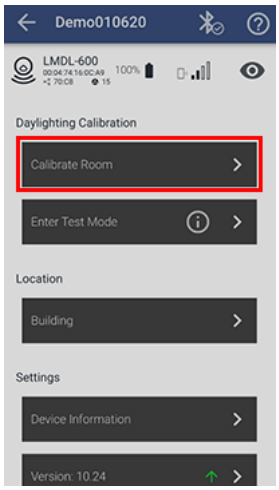


Calibration

Once the appropriate conditions are met, you can start the calibration process.

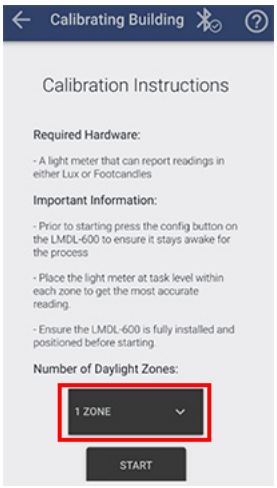
1. Ensure the LMDL-600 is paired to a network and all devices have been added to a room in the app.
2. Place the Light Meter in the appropriate area within the Daylighting zone. Typically, it should be placed in the middle of the daylighting zone. (If you are going to have more than one zone, you will need to calibrate each zone separately.)
3. Select the appropriate LMDL-600 within the room, then tap “Calibrate Room” to start the calibration process.

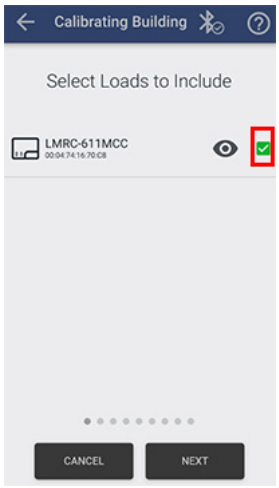




4. Follow the prompts on the screen. Select the appropriate # of zones and then tap **Start**. Next, select the appropriate room controller(s) located in the first zone. then tap **Next**. If there is more than one zone, after selecting the controller(s) for the first zone, you will then be asked to select the controller for the next zone. Once controllers have been assigned to all zones, you will proceed to the next step

   NOTE: Each zone can have more than one load/room controller assigned to it, but if there is more than one zone, a controller can be assigned to only a single zone. Once assigned, it will no longer appear for any further zones. If you are uncertain about which room controller is wired to which load, tap the icon of the eye . The load controlled by that room controller will blink on and off several times.

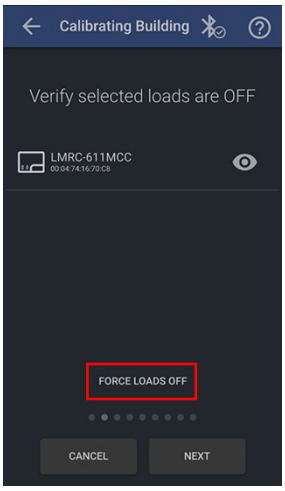


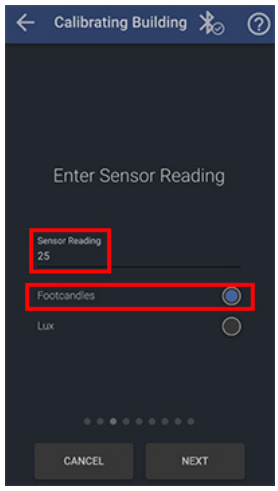


5. After selecting the appropriate loads to control, you will be prompted to input light meter readings. Ensure that the light meter is placed in the appropriate area of the daylighting zone (typically a desk). This is your task level lighting.

   You will be taking three different measurements, with the loads OFF, then at 50% dimming, then at fully ON at 100%. Follow the prompts to enter each measurement. The LMDL-600 and room controller will automatically use the daylight reading and consider the electrical light to determine the appropriate electrical light needed to maintain the target foot candle readings on the task level.

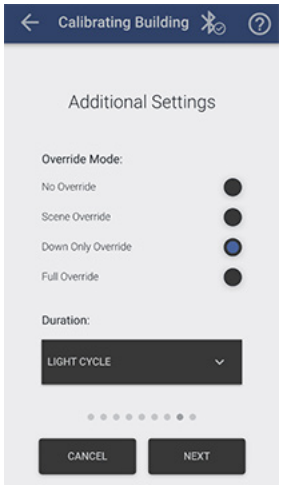
   The first screen asks you to verify that the loads are OFF. If needed, tap **Force Loads Off**, then tap **Next**. Enter the **Sensor Reading**. You must specify whether the reading is in **Footcandles** or **Lux**. Then tap **Next**.

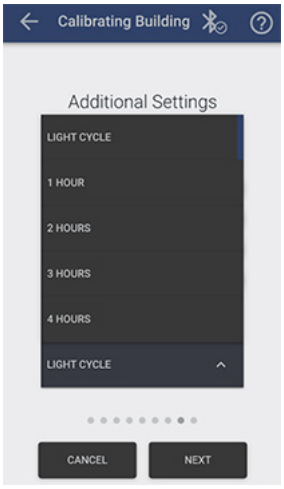


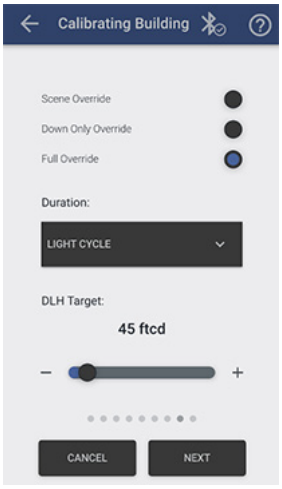


6. The screen now asks you to verify the that the loads are at Midpoint. Again you can tap the screen to force the loads to that amount (50% Dimming). Repeat the process of entering the meter reading, then proceed to doing the same with the loads fully ON.
7. Once you have entered the three metered values, the next screen displays **Additional Settings** that determine how the LMDL-600 responds.

   NOTE: If there is more than one zone,you will step through entering metered values for each zone before proceeding to the **Additional Settings** screen. The parameters on this screen apply globally to all zones.







8. Select the **Override Mode**. This mode determines whether the user can override the control of the daylight sensor, to increase or decrease the dimming level above the daylight cap. The daylight cap is the appropriate light level determined by the room controller and daylight sensor, which is based on the setting of the **DLH Target** (the target light level).

   No Override – Allows the user to dim up and down below the daylight cap (you cannot adjust light above the daylight cap), but you cannot select a **Duration**. Note that selecting this value is identical to choosing a value of "Down Only Override" and then selecting value of "Light Cycle" for the **Duration** parameter.

   Scene Override – Scenes can be sent to override the recommended load level determined by the daylight sensor and room controller.

   Down Only Override – This is similar to the No Override setting—the user dim up and down below the daylight cap. However, you can also set a **Duration** for the override.

   Full Override – You can fully adjust the load regardless of the daylight cap (including going above the daylight cap).

   NOTE: If the lights are turned OFF due to control by an occupancy sensor or a switch, when the lights are turned back ON again, they will revert to the level determined by the LMDL-600.

9. Select the **Duration**. This is the time it takes after the light level is raised or lowered by manual control (dependent on the value of the **Override Mode** parameter, before the room reverts back to the normal daylighting operation. For example, when you select "Full Override" and a 1 hour light cycle, if you adjust the load manually with a dimmer and there is no further manual intervention for 1 hour, the room will revert back to the normal automated daylighting setting.

   You can set a value of 1–4 hours, or "Light Cycle". The "Light Cycle" value is 0 hours, or No Override Duration, which means the override never expires (unless the lights are turned OFF, as noted above).

10. Select the **DLH Target**. This is the total light level at the task level (determined by placement of the light meter during calibration) that the daylight sensor and room controller will maintain.
11. Tap **Next**. The **Calibration Overview** displays the light meter values as well as the parameter values on the **Additional Settings** screen. Note that these values are stored in the room controller(s) assigned to the LMDL-600.

12. Tap **Finish** to complete the calibration process.

Adjusting Parameters with a Calibrated Daylight Sensor

After successful calibration, you can adjust the **Override Mode**, **Duration**, and **DLH Target** parameters by selecting the room controller that you want to modify, then tap **Change Parameters** to view the **Device Parameters** screen. Note that on this screen **Override Mode** is listed as **DLH Settings** and **Duration** is listed as **DLH Override Duration**.

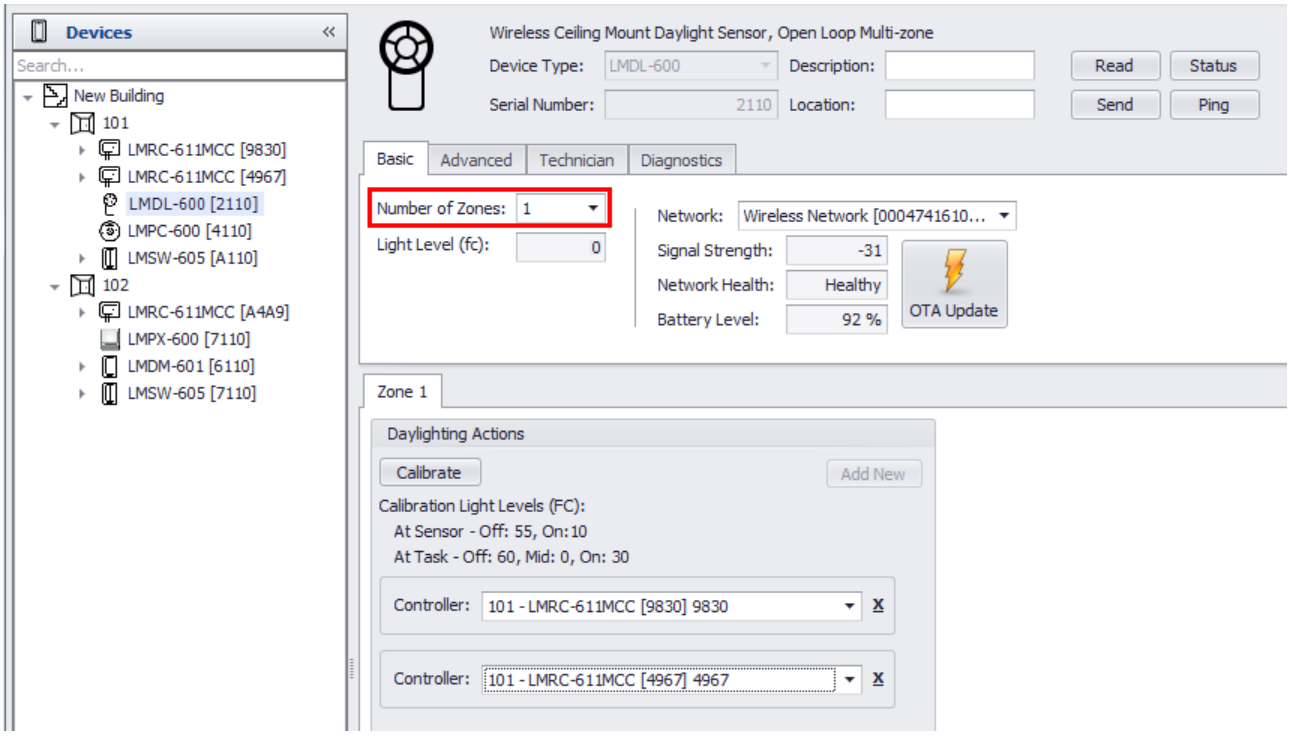
CALIBRATION WITH LMCS-100

Once the site has been commissioned and the LMDL-600 has been paired with the room controller(s) and assigned to a room, you can proceed with calibration.

Calibration

1. **Wake up** the LMDL (press the device face) and select your room within LMCS. Next, select the appropriate LMDL-600 in the tree.
2. Select the **Number of Zones**. You can select up to 3 zones. Each zone is assigned to different loads. Additional Zone tabs are added to the bottom of the window if you add zones. The **Light Level** parameter displays the current amount of light (in foot candles) read by the sensor. It will initially display 0. The value does not update automatically. You must click **Read** to update the value.

   NOTE: If not awake already, you must wake up the LMDL-600 by pressing on the sensor before clicking **Read**.

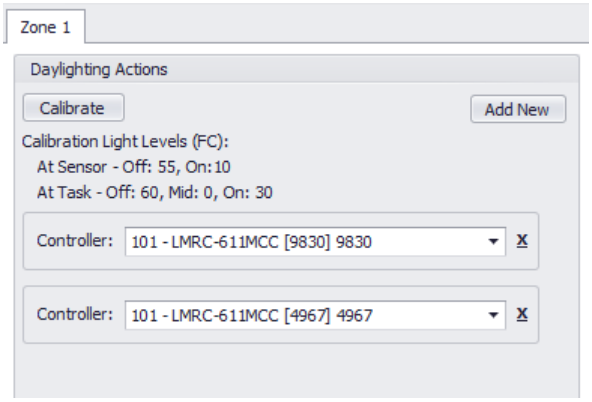


3. Select the specific room controller(s) assigned to each zone. On each zone tab, you assign the room controller for the zone.

   NOTE: If there is more than one room controller in a room, it is possible to assign more than one room controller to a zone. However, you should not assign the same controller to more than one zone.

   By default, if the LMDL-600 is assigned to a room with one or more room controllers, there will only be a single zone and all controllers are assigned to that zone.

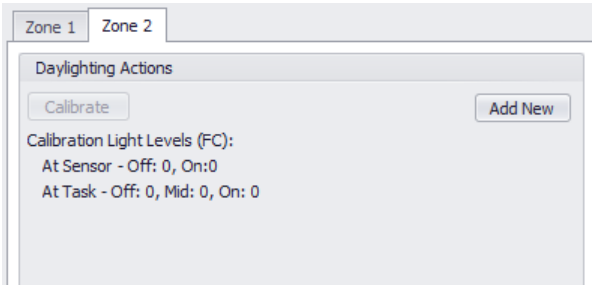
Zone Tab with Default Assignments



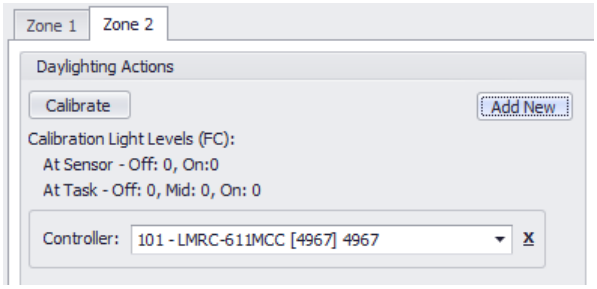
If you are going to have more than one zone, you can delete a controller from the default Zone 1 assignment by clicking the “X” to the right of the drop-down and then go to Zone 2 and add it by clicking **Add New**. LMCS will select the unassigned controller by default but you can select any room controller from the drop-down.

NOTE: LMCS will display **all** room controllers, even if they are not part of the room, so be careful to pick the one you want. The room name is shown before the room controller name, to help identify the correct controller.

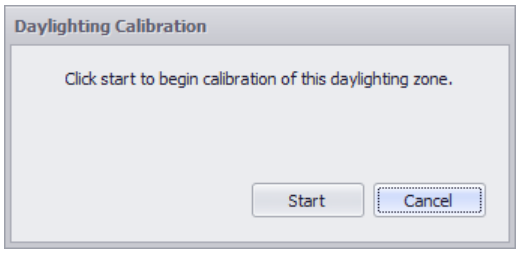
Zone Tab



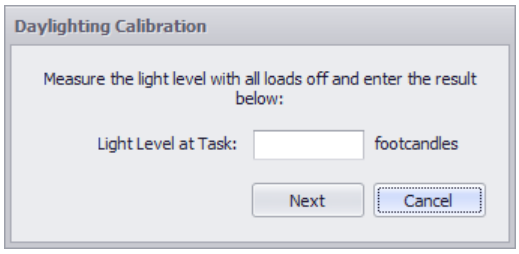
Zone Tab After Assigning a Controller



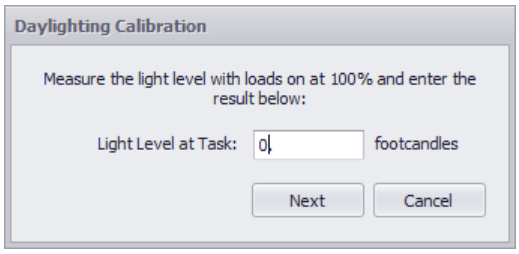
4. You will calibrate each zone separately. Place the Light Meter in the appropriate area within the Daylighting zone. Typically, it should be placed in the middle of the daylighting zone, at a desk. This is your task level lighting. **Ensure the light level reading is above 5 Fc** before beginning calibration.
5. Click **Calibrate**. The **Daylighting Calibration** dialog opens



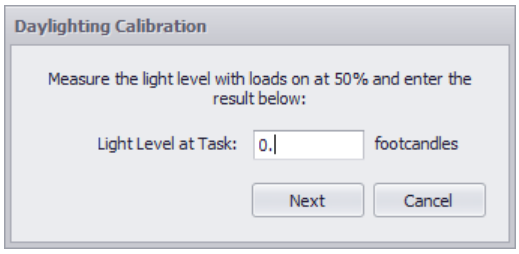
6. Click **Start**. LMCS attempts to connect with the LMDL-600, and if it does, the next dialog opens. LMCS will turn the load(s) off. (LMCS will turn off the loads for all room controllers assigned to that zone). Measure the light level with all loads off and enter the result in the dialog. Then click **Next**.



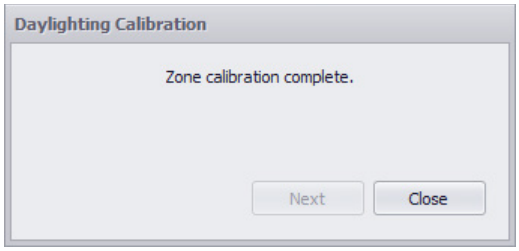
7. LMCS reads the light levels from the LMDL-600, and then the next dialog opens. LMCS will turn the load fully on. Measure the light level again, with all loads turned to 100%. Then click **Next**.



8. LMCS reads the light levels from the LMDL-600 again and then the next dialog opens. LMCS will set the load to 50% dimming level. Measure the light level again, with all loads turned to 50%. Then click **Next**.



9. LMCS reads the light levels from the LMDL-600 again and completes calibration. If it is successful, the following dialog displays.

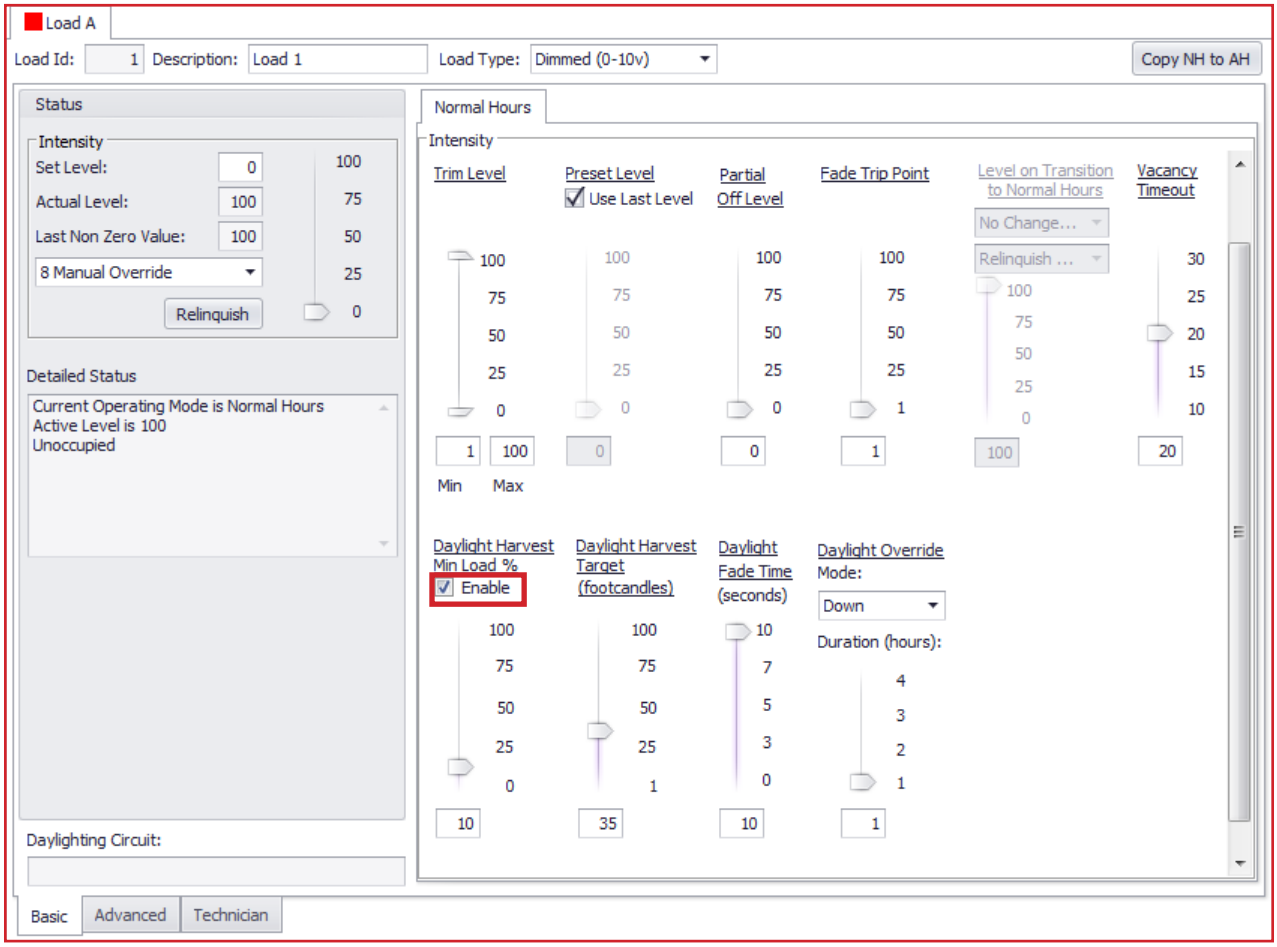


10. When you return to viewing the LMDL-600, the calibration light levels will be displayed in the Zone tab.
11. If there is more than one zone, repeat calibration for each zone, moving the light meter to the appropriate position for that zone.

Setting Daylighting Parameters on the Load Basic Tab

Once calibration is complete, final adjustment of daylighting parameters is required for **each** room controller assigned to a zone, on the **Load Basic** tab.

1. Highlight an appropriate room controller in the tree.
2. On the Load Basic tab, select the **Enable** checkbox. This will enable all daylight related parameters. (If this checkbox is not selected, the LMDL-600 will have no control over the room controller.)



3. Adjust the sliders or enter values for the Daylighting Parameters:

   Daylight Harvest Min Load % – Determines the lowest level the lights will be dimmed to due to daylight conditions.

   Daylight Harvest Target – The amount of light (in footcandles) the LMRC will try to create in the event that there is not sufficient daylight in the space. This is also called the daylight cap. **The default is 35fc if you do not adjust this.**

   Daylight Fade Time – The number of seconds for the transition from the current level to the new target level will take, after a change in the amount of daylight has been detected.

   Daylight Override Mode – The amount of time delay before daylighting control resumes, after daylighting control has been disabled due to a manual action such as a button or dimmer press. This works in conjunction with the value of the drop-down:

   - Up and Down – Allows the user to raise or lower the load (including going above the daylight cap).
   - Down – Allows the user to dim up and down below the daylight cap (you cannot adjust light above the daylight cap).
   - Scenes Only – Allows the user to change the load level only by using the LMSW-650 scene switch and not the LMDL-601 Dimmer.
   - No Override – Currently this is identical to the “Down” value.

NOTE: If the lights are turned OFF due to control by an occupancy sensor or a switch, when the lights are turned back ON again, they will revert to the level determined by the LMDL-600.

4. Repeat steps 12-14 for each room controller assigned to the LMDL-600.

WARRANTY INFORMATION	INFORMATIONS RELATIVES À LA GARANTIE	INFORMACIÓN DE LA GARANTÍA
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No. 30561 – 06/20 rev. 1

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