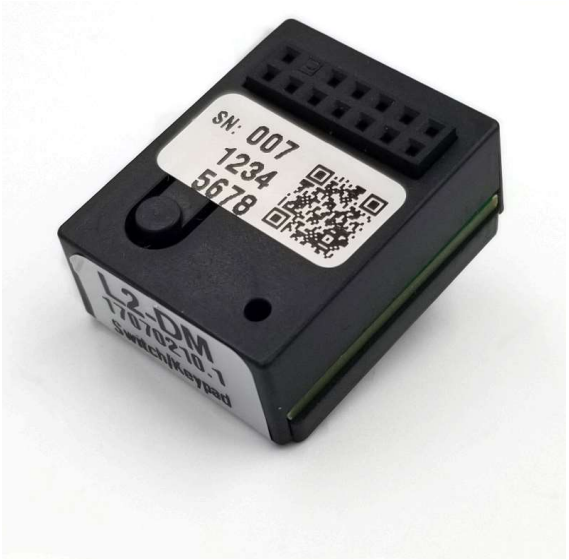
L2-DM

Switch/Keypad Input and 1 Zone PDM Controller, dimming, communicating

The Dimming Module controls a Zone of lights by reading input signals from attached switches or keypads connected to the PDM Port, and creates a Channel signal on the PDM. Up to 128 driver modules can listen to the Channel creating a group, or Zone, of lights. The L2-DM can be "stacked" underneath any driver so both switch inputs and lights can be attached to the same PDM Port. Only one L2-DM is allowed per Channel to create the PWM Channel signal. The L2-DM also sends 12VDC Accessory Power from the Accessory Power Regulator (L2-APR) to the RJ45 Port through a protection fuse. An L2-APR is required to power the microcontroller in the L2-DM. Up to 16 L2-DM are powered by the L2-APR in the middle of the PDM. L2-DM can receive commands and transmit their output status over the PDM communication bus to interface to third party control systems and the L2-EGW Ethernet Gateway. Solving many more roles than just a dimmer for lighting, eleven modes of operation allow the L2-DM to read on/off, momentary, top/bottom switches, motion sensing, occupancy sensing, exhaust fan controls, ceiling fan controls, doorbells, and 1 to 8 button keypads. No software or gateway is required for most configuration steps, even setting basic lighting scenes thanks to 1 button macros. Advanced settings can be accessed using the L2-EGW.

POWER & CONNECTIONS	
Power consumed	0.2 W (Requires L2-APR on the same L2-PDM)
Top connector	Female 14 pin, 1 alignment pin (plugged)
Bottom connector	Male 14 pin, 1 alignment pin (clipped)
PDM voltage	12-65VDC (pass through)
Port voltage maximum	65VDC (pass through)
Current maximum	1.5A (pass through)
Port current maximum	1.25A
Accessory 12V protection	1.2A non-resettable fuse
RS485 CONTROL BUS	
Communication speed	38,400 bps
Control protocol	Published dimming module protocol
ZONE CHANNEL OUTPUT	
Control channel signal type	0-5VDC, PWM Broadcast
Maximum drivers controlled	128
PORT SWITCH INPUT	
Switch types	1 button momentary, Top/Bottom momentary 2 button, 1-8 button keypad, ON/OFF switch, Motion detector, Occupancy detector, Ambient light threshold sensor, Sensor relay (leaks, temperature, etc)
PHYSICAL/ENVIRONMENTAL	
Dimensions	1 x 1.25 x 1.1in (25 x 34 x 30mm)
Operating temperature	+32°F to +122°F (0°C to +50°C)
Operating humidity	5% to 95% Non-condensing
Rating	Dry Rated
Environmental	RoHS
Safety certifications	FCC, CE
WARRANTY	
Duration	5 Years



ORDERING INSTRUCTIONS:

PART ID	MODEL	DESCRIPTION
17070210.1	L2-DM	Switch/Keypad Input and 1 Zone PDM Controller, dimming, communicating

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L2-DM SET button and indicator LED operation:
The green LED indicator on the front face of the L2-DM indicates one of 11 Mode states (0..10) by flashing the Mode number, then a small pause, then repeating the cycle. Wait for the pause and count the number of flashes to obtain the mode.

Press the SET button on the face of the L2-DM to increment the Mode and cycle from 0 (solid LED indicator) to 10 flashes (Mode 10). Pressing the SET button when you see 10 flashes will return to Mode 0 (LED on solid).

MODE	MODE NAME	PORT DEVICES	DESCRIPTION
0	Remote Only	n/a	Ignores all switch inputs from the Port. Only responds to serial data commands via the Comm Bus.
1	Normally Open Switch	N/O door switch, Relay	Sets zone to OFF when the switch input is shorted. Sets zone to 100% when the switch input is open. Used for toggle switches or automatic door pushbuttons.
2	Normally Closed Switch	N/C door switch, Relay	Opposite action of Mode 1. Turns on the zone when the input is an open circuit.
3	Button Toggle ON/OFF	Buttons, L3-KP1, L3-TP1	Toggles output between OFF and 100% each time the momentary button is released. Top and Bottom buttons do the same function when using an L3-KP1.
4	Top/Bottom Switch w/ Restore Level	L3-WK1	Two momentary buttons: Tap the UP button to set output to Restore Level. Tap UP button again to set output to 100%. Tap the DOWN button to turn OFF the zone.
(5)	Top/Bottom Switch w/ Restore Level and Dim/Raise	L3-WK1	Tap the UP button to set output to Restore Level. Tap the UP button again to set output to 100%. Tap the DOWN button to set output to OFF. Hold the UP button to raise output to 100%. Hold the DOWN button to lower output to 1%. Default mode.
6	Button Toggle ON/OFF w/ Dim/Raise	L3-KP1, L3-TP1	Tap to cycle between A)Restore Level, B)100%, and C)OFF. Hold when output is below 50% to raise output level. Stops at 100%. Hold when above 50% to dim output. Stops at 1%. Alternate mode is selectable via Gateway commands. Top and Bottom buttons on an L3-WK-D respond the same to the tap feature.
7	Silent Follower	n/a	Ignores all switch inputs and responds to level replies from DM messages with the same ID. This mode **does not send a reply message** to a level change.
8	Keypad, Touchpad	L3-KP*, L3-TP*	Performs one of 4 functions responding to one of 8 keypad buttons being pressed. Any of the buttons can A)Request a Scene, B)Toggle a Zone ID, C)Toggle a Scene on/off, D)Raise the last zone button pressed, or E)Dim the last zone button pressed. Buttons 1..8 can be spread across multiple attached keypads attached to the L2-DM in groups of 4.
9	Timer Fan	L3-KP*, L3-TP*	Allows exhaust fans to be controlled by a 4 button keypad as follows: Top button toggles the Fan on/off. Buttons 2,3,4 start a countdown timer of 15, 30, and 60 minutes.
10	Doorbell	Buttons, Relays, L3-DB*	Momentarily turns on the PDM channel output for 1 second each time the doorbell is pressed.

Manually set and view the ID number:
Typically the ID #s will be assigned by the L2-EGW Gateway. To manually assign an ID # of an L2-DM, Hold the SET button for 3 seconds and release. Then tap the SET button the number of times of the ID. The green LED will flash each time you press the SET button. Wait 5 seconds without pressing the button and the LED will remain solid for 2 seconds indicating the ID has been stored. To check the ID, hold the SET button for 3 seconds, release, and count the LED flashes.

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Tool-free commissioning using Configuration Macros:
In addition to selecting the 11 Modes of operation, the SET button can be used to run configuration macros that store advanced settings like Scenes and Keypad buttons.

To Reset or Store values in the L2-DM memory, count the LED indicator flashes and set the current Mode to one of the modes in the table below, then hold the SET button for 6 seconds or until you see fast flashes. This will run the Configuration Macro as follows:

SET button RESET/STORE functions (HOLD 6 seconds to perform configuration macros)		
MODE	DESCRIPTION	FUNCTION(S) PERFORMED
0	“CC Lights”	Resets min/max to 30/220. Mode is set to 5.
1	“SV Bulbs”	Resets min/max to 25/220. Mode is set to 5.
2	“SV Strips”	Resets min/max to 1/255. Mode is set to 5.
4	“Fans”	Resets min/max to 255/255. Mode is set to 4.
5	“Factory Default”	Resets min/max to 30/220. Mode is set to 5. Reset ID to 0. Erase scenes. Reset EEPROM.
6	“Scenes”	Add Scene 1 at the current level. Add Scene 2 at 255”ON” level. Add Scene 3 at 0”Off” level. Mode is set to 5.
7	“KP: 2 zones”	Set buttons 1..4 as: 1)MyZone, 2)MyZone+1, 3)Dim, 4)Raise. Mode is set to 8. If ID was 0 (default) it is set to ID 3.
8	“KP: Scenes”	Sets buttons 1..4 as: 1)Scene 1, 2)MyZone, 3)Scene2:"AllOn", 4)Scene3:"AllOff". Mode remains at 8. If ID was 0 (default) it is set to ID 3.
9	“Timer Fan”	Sets buttons 1..4 as: 1)Zone x"self", 2)15min, 3)30min, 4)60min. Mode remains 9.

Configuration Example 1: Three lighting zones and a keypad in a Scenes configuration.
The factory default is Mode 5 (5 flashes) so each example assumes each L2-DM starts in Mode 5.

Kitchen CC-type lights and a wall switch attached to PDM port with DM+CC stacked in one port

Set a dim level	*Use wall switch (Press the top button of the switch, then hold bottom to dim to level)*
Mode 6 then Reset	*Stores the scenes and current level scene 1*

Kitchen Pendants and a 4-button Keypad attached to PDM Port with DM+SV stacked

Mode 1 then Reset	*Sets the min/max for the SV-Bulb recommend range*
Set dim level	*Use keypad buttons 1 (Up) and 3 (Down)*
Mode 6 then Reset	*Stores the scenes and current level scene 1*
Mode 8 then Reset	*Set "Scenes sample configuration" for the keypad buttons*

Under Cabinet Strips and a wall switch attached to PDM Port with DM+SV stacked

Mode 2 then Reset	*Sets the min/max for the SV-Strips recommend range*
Set dim level	*Use wall switch*
Mode 6 then Reset	*Stores the scenes and current level scene 1*

To operate from the keypad:

Press keypad button 1 for the "Welcome Scene" which recalls the dimmed levels stored before the Mode 6+Reset.
Press keypad button 2 to toggle the pendant zone on/off.
Press keypad button 3 for All On 100% Scene.
Press keypad button 4 for All Off Scene.

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Configuration Example 2: Three lighting zones and a keypad in a Scenes configuration.

To change the keypad to control the downlights and the pendants with Zone toggle buttons, and Raise and Dim buttons, at the Keypad L2-DM, we need to assign an ID to the downlight zone and change the keypad configuration as follows:

Kitchen CC lights zone L2-DM:

Hold the SET button 3 seconds to enter “Ready to assign ID state”.
Press the SET button 4 times only. Wait 5 seconds. To confirm ID, Hold SET button 3 seconds and count flashes (4).

Kitchen Pendants zone with the keypad attached to the L2-DM:

Mode 7 then Reset *Sets "2 zones+raise/dim sample configuration" for the keypad buttons*

To operate from the keypad:

Press keypad button 1 to toggle the pendant zone on/off (Zone ID 3, same as keypad)
Press keypad button 2 to toggle the downlight zone on/off (Zone ID 4, the keypad DM ID+1)
Press keypad button 3 to raise the last zone tapped
Press keypad button 4 to dim the last zone tapped