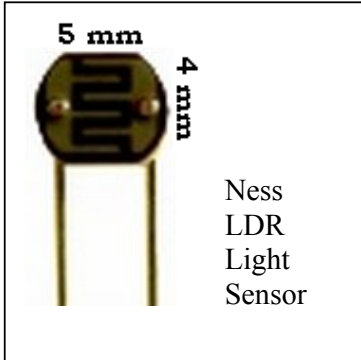


M1 APPLICATION NOTE Light Dependant Resistor (Light Sensor)



Use of Analog Inputs



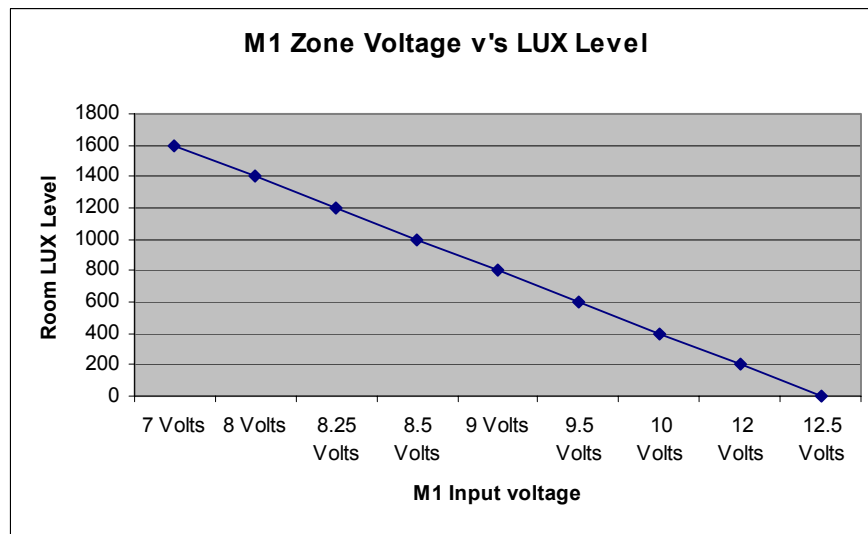
Although the M1 has a Sunrise / Sunset clock built in that will determine when the sunrises and sets, hence if it is Dark or Light outside, often inside light is a totally different subject. The system needs to know what the light level is in a particular room so when automating internal lighting it needs to know if the lights should be activated or not. Otherwise it defeats the purpose of energy saving by Automating the lights for cost savings.

One way of doing this is with a \$5.00 item from Ness with our Ness-LDR.

This LDR wires directly into a M1 Zone Input (Any Zone). The Zone need to be programmed as a Analog Zone.

The more light the LDR sensor has on it the lower the voltage the zone will read and the lower the light level, the higher the zone voltage.

The following table will provide a summary of the type of voltages v's light (Lux) you could expect to read.

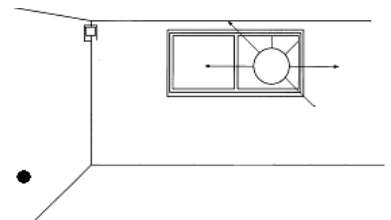


For example, If a room was dimly lit the M1 Zone Voltage may read 12 Volts, where a sun filled room may read 8 Volts. Therefore we don't want to waste power turning lights on when it is sun filled and already has a LUX level of around 1000+ Lux.

Each room can be adjusted according to the clients requirements and to where the LDR sensor is installed, however as a general rule of thumb and starting point around 11 – 12 Volts (approx 300 LUX) is a good place to start.

Installation.

As the Ness LDR is very small (approx 5 mm x 4mm x 2 mm) it can be installed anywhere. Although it can be installed on a PIR detector consideration must be given as to the amount of light near the ceiling in a corner compared to lower near the floor. As a suggestion you could mount it on a blank electrical plate attached to the wall near the floor / power point level where the light is more even. This would change from site to site, room by room.



The LDR Sensor is wired directly to any Zone input. (Even the Keypad Zone input, (where a good location for the LDR could be on the keypad!)) It does not need power.

The Zone needs to be set as an Analog input.

Zone: 16
Name: Family Room LDR
Configuration
Definition: 34 = Analog Zone
Type: 7 = Analog Zone
Area: 1

You can then connect to the M1 and read the zone voltage directly from NessRP Software (Or system keypad). When connected to the panel with NessRP, click on “Status”



Then scroll down to the zone the LDR Sensor zone and the voltage will be displayed. In the following example Living Room (Zone 14) is showing a voltage of 8.7 Volts (approx 900 Lux, which is a well lit room), where the Family Room (Zone 16) is very Dim with a reading of 11.4 Volts (Approx 220 Lux)

Zone	Name	Status	Byp	Definition	State	Volts
13	Living Room PIR	Normal	<input type="checkbox"/>	04 = Burglar Interior	Open (+)	13.6
14	Living Room DLR	Normal	<input type="checkbox"/>	34 = Analog Zone	EOLR (=)	8.7
15	Family Room PIR	Normal	<input type="checkbox"/>	04 = Burglar Interior	EOLR (=)	7.3
16	Family Room LDR	Normal	<input type="checkbox"/>	34 = Analog Zone	Open (+)	11.4

If you know how dim you want the room before it started the Automation of the lights (*starting point approx 300 Lux as a guide only*) you can then write some rules to use these readings.

For example, when motion is detected in a room that is dim you may want the lights to come on, however if there is enough light in the room don't turn the lights on. The rule could look like this.

Example.

Whenever Family Room PIR (ZN 15) Becomes Not Secure
AND Family Room LDR (ZN 16) Is Greater than Analog Value 11.0 Volts
Then Turn Family Room (8 (A8) On, Fade Rate=0 for 10 minutes.

Upon trial and error for each room you can adjust the amount of light required in the room before the lights will turn on by adjusting the “AND” rule and set the required input voltage reading.

For example if the lights are coming on when it is still too light, the rule can be fine turned by changing it to something like the following;

Whenever Family Room PIR (ZN 15) Becomes Not Secure
AND Family Room LDR (ZN 16) Is Greater than Analog Value **12.0** Volts
Then Turn Family Room (8 (A8) On, Fade Rate=0 for 10 minutes.

Or from the original rule if the lights were not coming on when it was very dull you may fine tune in the other direction with something like the following rule;

Whenever Family Room PIR (ZN 15) Becomes Not Secure
AND Family Room LDR (ZN 16) Is Greater than Analog Value **10.0** Volts
Then Turn Family Room (8 (A8) On, Fade Rate=0 for 10 minutes.

In all of our above examples we have the lights coming on for 10 minutes. Even if there is continual movement during this time the light will turn off after 10 minutes and then turn back on if there is movements again.

If you require the timer to be continually re-triggered and the lights stay on for 10 minutes after the last movement is detected then you will need to modify your rule to something like the following;

Whenever Every 2 Seconds
AND Family Room PIR (ZN 15) Is Not Secure
AND Family Room LDR (ZN 16) Is Greater than Analog Value 11.0 Volts
Then Turn Family Room (8 (A8) On, Fade Rate=0 for 10 minutes.

If you wish to give the customer a pre warning that no movement has been detected and instead of turning the lights off immediately you may wish to dim the lights slightly for a short time (e.g. 1 minute) to allow them to move to reactivate the lights and the 10 minute timer. This can be achieved by modifying and adding additional rules. *(Note the lighting system needs to be wired to a dimmer module to achieve this.)*

Whenever Every 2 Seconds
AND Family Room PIR (ZN 15) Is Not Secure
AND Family Room LDR (ZN 16) Is Greater than Analog Value 11.0 Volts
Then Turn Family Room (8 (A8) On, Fade Rate=0 for 10 minutes.
Then Turn Output 208 (Out 208) On for 9 minutes, Restart timer If Running

(Remember to include the “Restart Time If Running”)

Whenever Output 208 (Out 208) turns off
AND Family Room LDR (ZN 16) Is Greater than Analog Value 11.0 Volts
Then Turn Family Room (8 (A8) To 50% Bright, Fade Rate = 0 for 10 Seconds



**Got Questions or Ideas?
We welcome your feedback
and any application notes /
Ideas you have.**

Please Email me at
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