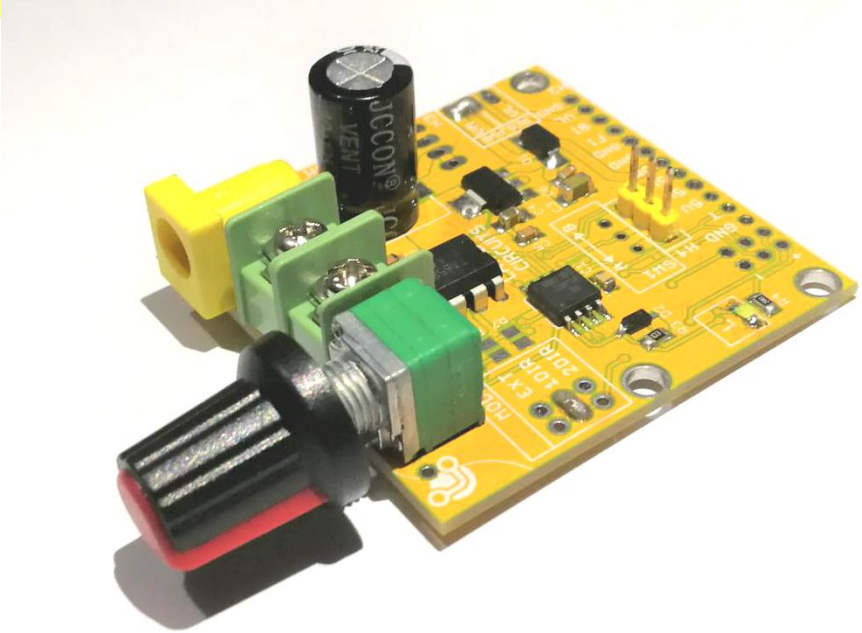
One Channel Irrigator User Guide

OVERVIEW

The Layad Circuits One Channel Irrigator is a complete, low-cost solution for projects requiring automated moisture-based watering and irrigation. It has all the parts required to setup an automated irrigation system in minutes.



To cater to different applications, the Layad Circuits One Channel Irrigator comes in two main variants - a motorized valve-based kit and a pump-based kit. The valve-based kit is suitable for controlling liquid flow in a system while the pump-based kit is more suitable for systems requiring movement of water usually from a lower to a higher elevation. Moreover, the Layad Circuits One Channel Irrigator is equipped with a corrosion-resistant capacitive soil moisture sensor and a knob for adjusting the moisture level threshold value at which the valve or pump is activated and deactivated.

The Layad Circuits One Channel Irrigator operates by acquiring moisture level data from the capacitive soil moisture sensor and using this data to activate or deactivate the motorized valve or pump. The device performs automatic debouncing of and hysteresis on the soil moisture data to properly operate the valve or pump.

The Layad Circuits One Channel Irrigator also makes sure that proper delays and rest periods for the valve or pump are observed during operation to prevent damage. The built-in potentiometer allows the user to adjust the moisture level threshold value at which the valve or pump is activated and deactivated. The on-board heartbeat LED indicates that the device is

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B314 Lopez Bldg., Session Rd. cor. Assumption Rd., Baguio City, Philippines
General inquiries: info@layadcircuits.com Sales: sales@layadcircuits.com FB: facebook.com/layadcircuits Mobile: +639164428565

functional and operating. All of these processes are done automatically by the device, without the user having to write a single line of code.

KEY FEATURES

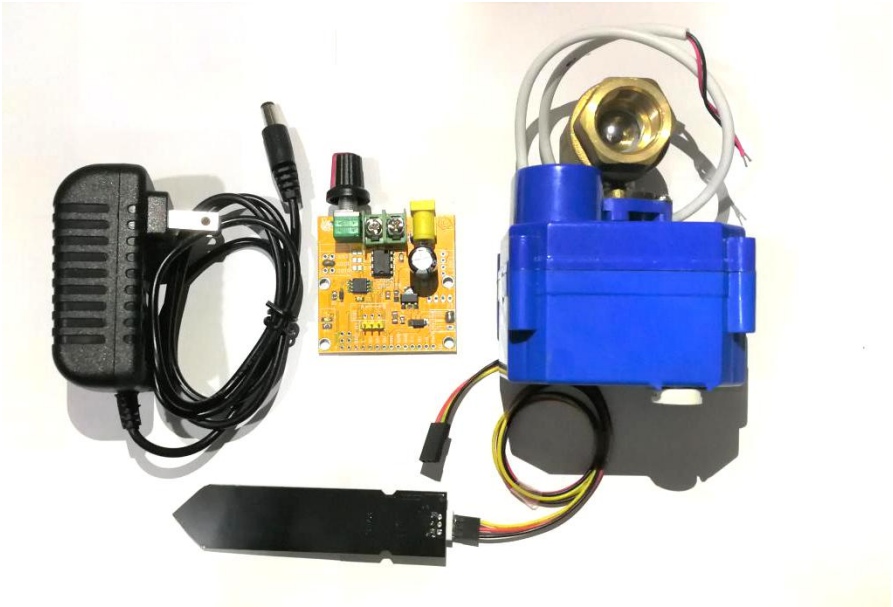
- *Automatic Moisture-based Irrigation*
- *Low-cost and Stand-alone Operation (No Programming Required)*
- *Built-in Corrosion-resistant Capacitive Soil Moisture Sensor*
- *Automatic Handling of Signal Debouncing and Hysteresis*
- *Threshold Adjustment Potentiometer*
- *Heartbeat Indicator LED*
- *Compact PCB dimensions: 50x50x15mm*

APPLICATIONS

- *Agriculture*
- *Greenhouse Irrigation*
- *Indoor and Urban Gardening*
- *Landscape Gardening*
- *Terrariums*
- *For Research and Laboratories*

PARTS AND CONNECTIONS

VALVE-BASED KIT



The valve-based kit comes with an irrigator controller board, a DC power supply, a capacitive soil moisture sensor, and an electronically controlled valve. The image below shows the proper wiring of the valve to the irrigator controller board terminals.

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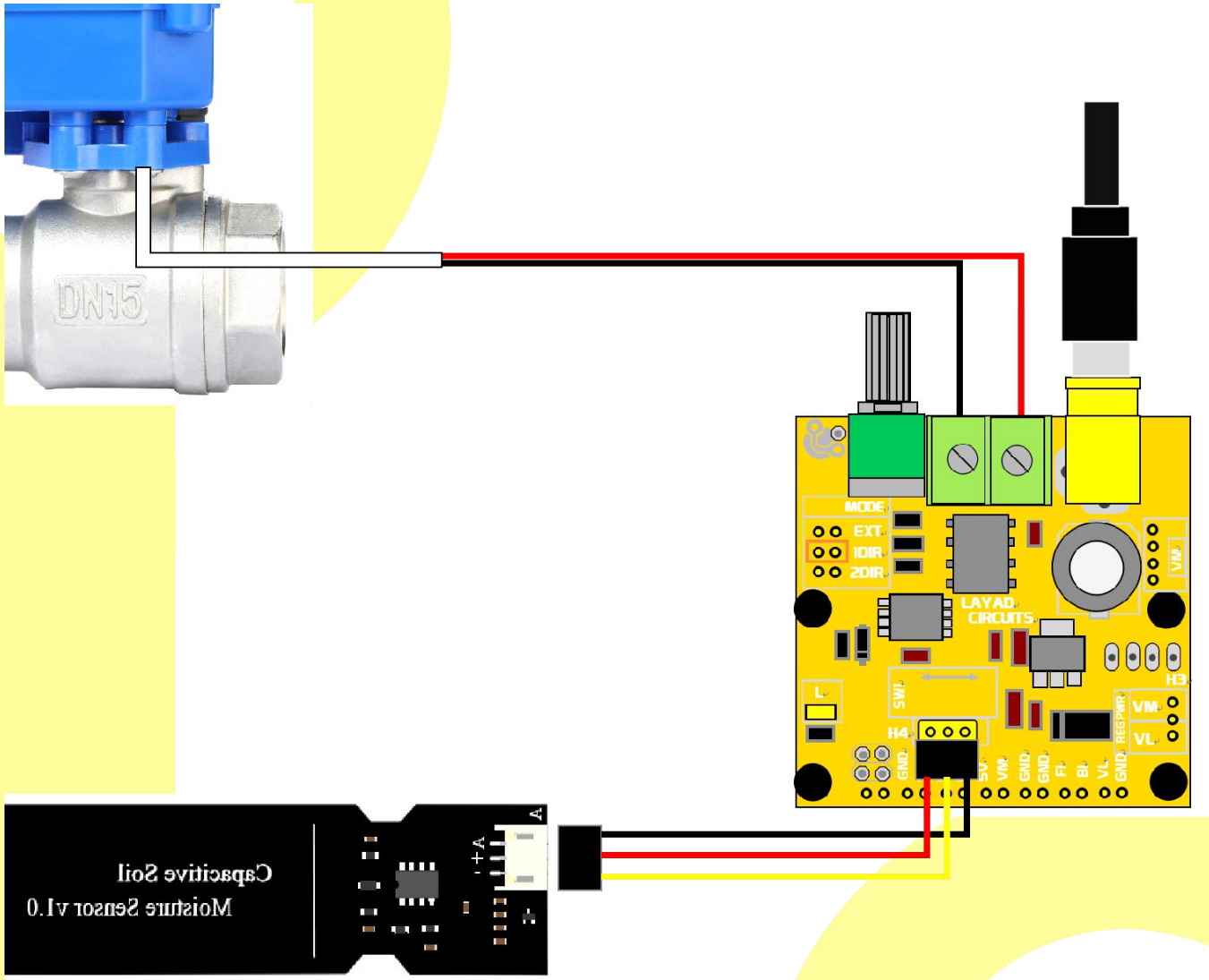

If required, the wires can be reversed by removing power from the device first then by using a screw driver to remove and return the terminal screws.

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PUMP-BASED KIT

The pump-based kit comes with an irrigator controller board, a DC power supply, a capacitive soil moisture sensor, and a submersible water pump. The image below shows the proper wiring of the submersible water pump to the irrigator controller board terminals.

Note/s:

The submersible pump included in the pump-based kit has a pump head of 40 cm. For applications requiring a higher pump head, see the section “OPTION FOR MODIFICATION and UPGRADE”.

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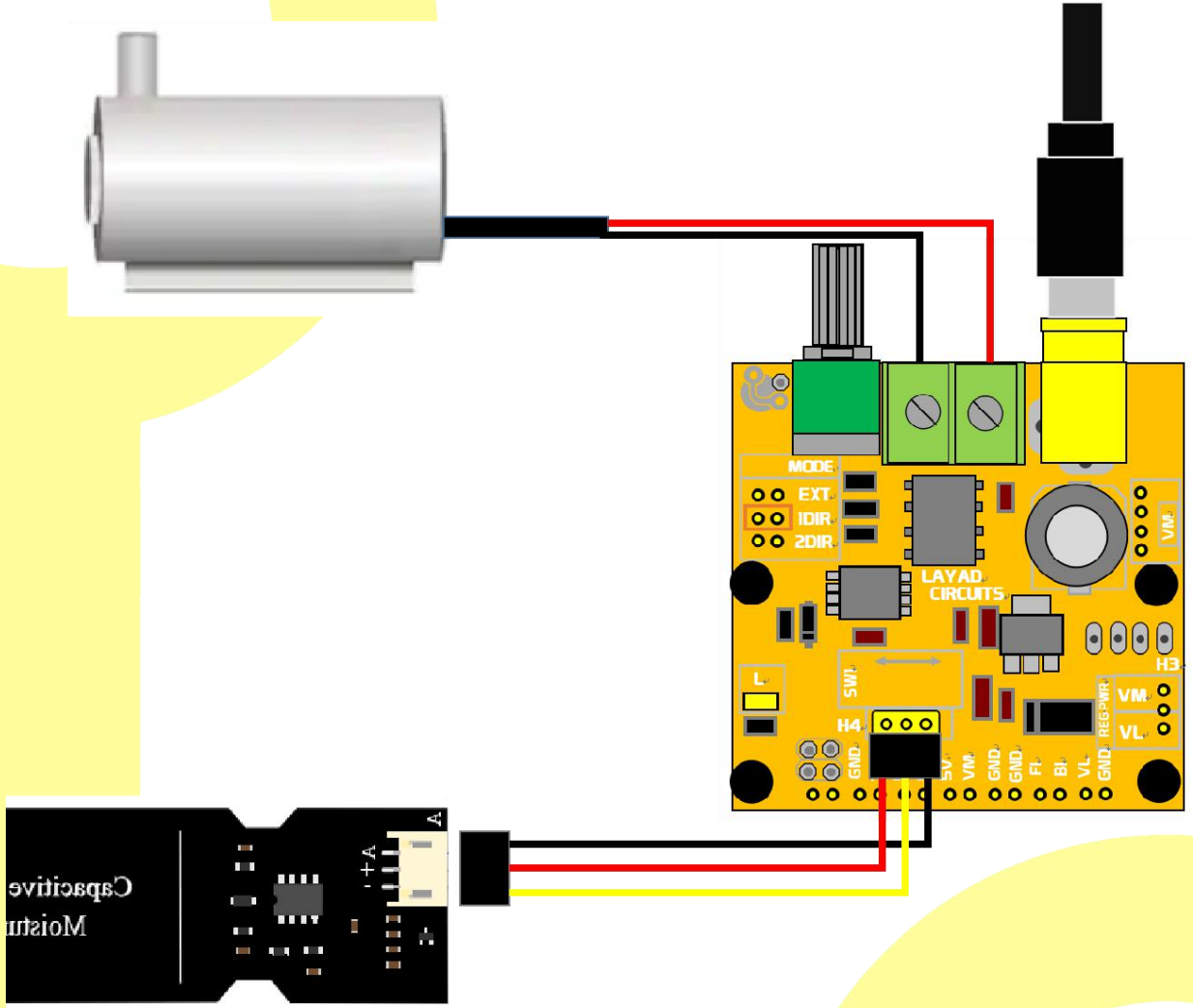
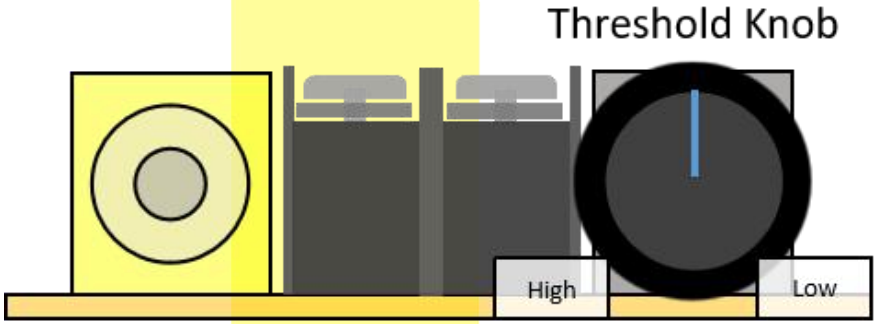


If required, the wires can be reversed by removing power from the device first then by using a screw driver to remove and return the terminal screws.

OPTION FOR MODIFICATION AND UPGRADE

In some applications, a more powerful pump might be required. For these cases, it is possible to replace the existing submersible pump of the pump-based kit with a larger pump. However, the user must ensure that the maximum current draw of the new pump is limited to 2 amperes only. Also, the user must replace the existing DC power supply with an adequate DC power supply capable of supplying enough power to the new pump. Input voltage to the irrigator controller board should be between 6 V and 12 V **only**. See the section "TECHNICAL SPECIFICATIONS" for more information.

TRIGGER THRESHOLD ADJUSTMENT



When the threshold adjustment knob is at the LOW position, the device will irrigate ONLY when the soil moisture level being detected by the soil moisture sensor is LOW. When the threshold adjustment knob is at the HIGH position, the device will irrigate even if the soil moisture level being detected by the soil moisture sensor is HIGH. Set the threshold knob to anywhere in the middle to irrigate when the optimum level of soil moisture level is reached.

SIGNAL DEBOUNCING AND HYSTERESIS

The One Channel Irrigator performs automatic debouncing of and hysteresis on the soil moisture data to properly operate the valve or pump. The device does this by constantly monitoring the soil moisture and making sure that the readings are stable for a certain period of time before operating the valve or pump.

ORDERING INFORMATION

Ordering Code	Description	Revision
LC-060ES-001	Pump-based Kit	v.1.0.0
LC-060ES-002	Integrated Valve-based Kit	v.1.0.0
LC-060ES-003	Actuator Valve-based Kit	v.1.0.0

TECHNICAL SPECIFICATIONS

Parameter	Minimum Value	Typical Value	Maximum Value
Supply Voltage for Pump based kit	5 V	-	6 V
Head for Pump based kit			40 cm
Supply Voltage for Valve based kit	-6V or 12V depending on valve version		
Current Consumption (valve-based kit)	100mA	200 mA	1A
Current Consumption (pump-based kit)	100mA	700 mA	2A
Length (controller board only)		50 mm	
Width (controller board only)		50 mm	
Height (controller board only)		15 mm	

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