LoRaWAN® Solenoid Valve Controller

UC51x Series

◆ Introduction

The UC51x series LoRaWAN® Solenoid Valve Controller is a device used to remotely control DC latching solenoids for valves. It contains two solenoid interfaces and two GPIO interfaces, allowing easy local or remote control. In addition, it also offers an optional version with an AI interface, which can connect to a pressure sensor to monitor water pressure during irrigation, enabling a more intelligent irrigation solution. Besides ultra-low-power LoRaWAN® technology, UC51x series also features a built-in solar panel and high-capacity batteries for long-term operation. For outdoor applications, it equips with an IP68-rated enclosure and M12 connectors, providing protection against water and dust under harsh environments.

UC51x series is widely used for agriculture valves, landspace irrigation systems, garden irrigation systems, etc.



UC511



UC511 (EA)



UC511 (AI)



UC511 (EA-AI)



UC512



UC512（EA）



UC512（AI）



UC512（EA-AI）

◆ Features

- Compatible with standard DC latching solenoids
- Waterproof design including IP68 case and M12 connectors
- Solar-powered and built-in chargeable batteries
- OPEN/CLOSE control by mobile App locally or commands remotely
- Support multiple local rules allows for flexible control without network
- Two GPIO interfaces for flow monitoring or valve status monitoring
- Transmission distance up to 15 km with line of sight
- Support Milesight D2D protocol to enable ultra-low latency and direct control without gateways
- Equipped with NFC for easy configuration
- Time and flow control via Milesight IoT Cloud or Milesight Development Platform
- Support multicast for control in bulk
- Supports timed switching of working modes for easier product deployment and maintenance
- Support water pressure collection and threshold alarm
- Support Firmware Update Over the Air (FUOTA) feature

◆ Specifications

Model	UC511	UC512
Wireless Transmission		
Technology	LoRaWAN®, Milesight D2D	LoRaWAN®
Antenna	Internal Antenna or External Antenna (Hardware Optional) External Antenna (EA) Version: 1 × 50 Ω SMA Female Connector	
Frequency	CN470/IN865/EU868/RU864/US915/AU915/KR920/AS923-1&2&3&4	
Tx Power	16dBm (868 MHz)/20dBm (915 MHz)/19dBm (470 MHz)	
Sensitivity	-137dBm @300bps	
Working Mode	OTAA/ABP Class A, Class B, Class C, Class C to B	OTAA/ABP Class A, Class B
Data Interfaces		
Interface Type	M12 A-Coded Male	
Solenoid Interface		
Ports	2 × Solenoid Interfaces	
Solenoid Support	2 Wires DC 12V Latching Solenoids	
Cable Length	1.5m (by Default)	
GPIO Interface		
Ports	2 × Digital Inputs	
Logical Level	Low: 0~0.8 V, High: 2.5~3.3 V	
Maximum Current	20 mA	
Work Mode	Digital Input, Pulse Counter	
Input Frequency	Suggested value: ≤ 4000 Hz	
Pressure Collection Interface (AI Version Only)		
Interface Type	M12 A-Coded Male	
Supported Pressure Sensor	PS02, PS03 Refer to Optional Sensor	PS02 Refer to Optional Sensor
Others		
Button	1 × Power/Reset Button (Internal)	
USB	1 × Type-C (Internal) for Console	
LED Indicator	1 × Reboot/Reset (Internal)	
Power Connector	1 × M12 A-Coded Male Interface (EA Version Only)	-
Software		

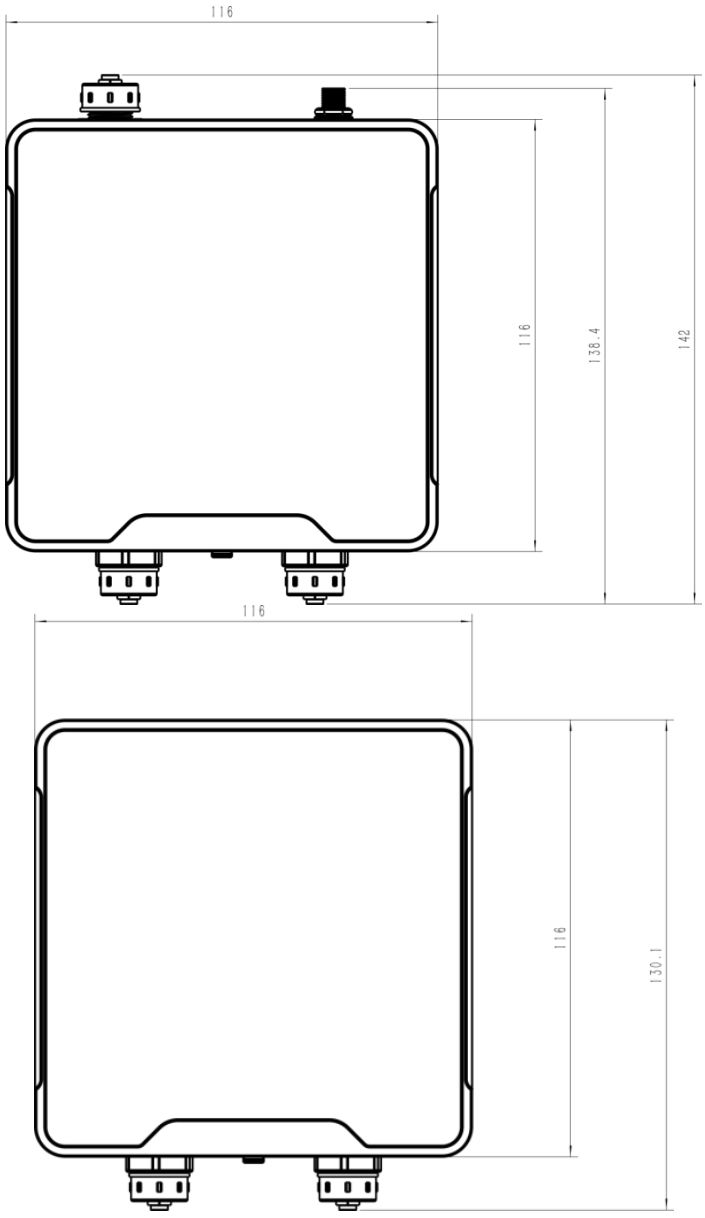
Power On & Off	Mobile App via NFC, Power Button (Internal), Cable Connection	
Configuration	Mobile App via NFC	
Advanced Feature	Multicast, Milesight D2D Agent, Local Rules, Water Pressure Alarm	Multicast, Local Rules, Water Pressure Alarm
Physical Characteristics		
Power Supply	1. Embedded Solar Power (6V, 1.7W) 2. 2 × 2550 mAh ICR18650 Chargeable Batteries 3. DC 5-24 V by Power Connector (EA Version Only)	3 × 9000 mAh Replaceable ER26500 Li-$SOCl_2$ Batteries
Battery Life*(20 min interval + control valve 4 times per day, 25°C)	When battery level is full and does not charge: Class A: Around 8.4 years (SF7), Around 3.3 years (SF10) Class B: Around 1.1 year Class C: Around 26 days	Class A: >10 years Class B: Around 6.2 years (SF7), Around 5.8 years (SF10)
Operating Temperature	-20°C~60°C	-30°C~70°C
Relative Humidity	0 ~ 95% (Non-condensing)	
Ingress Protection	IP68 (1m underwater, 7 days)	
Dimension	116 × 116 × 45.5 mm (4.56 × 4.56 × 1.79 in) (Connectors Excluded)	
Weight (With Batteries)	IA Version: 425g EA Version: 467g	IA Version: 479g EA Version: 521g
Installation	Wall or Pole Mounting	
Approvals		
Regulatory	CE, FCC	
Environmental	RoHS	

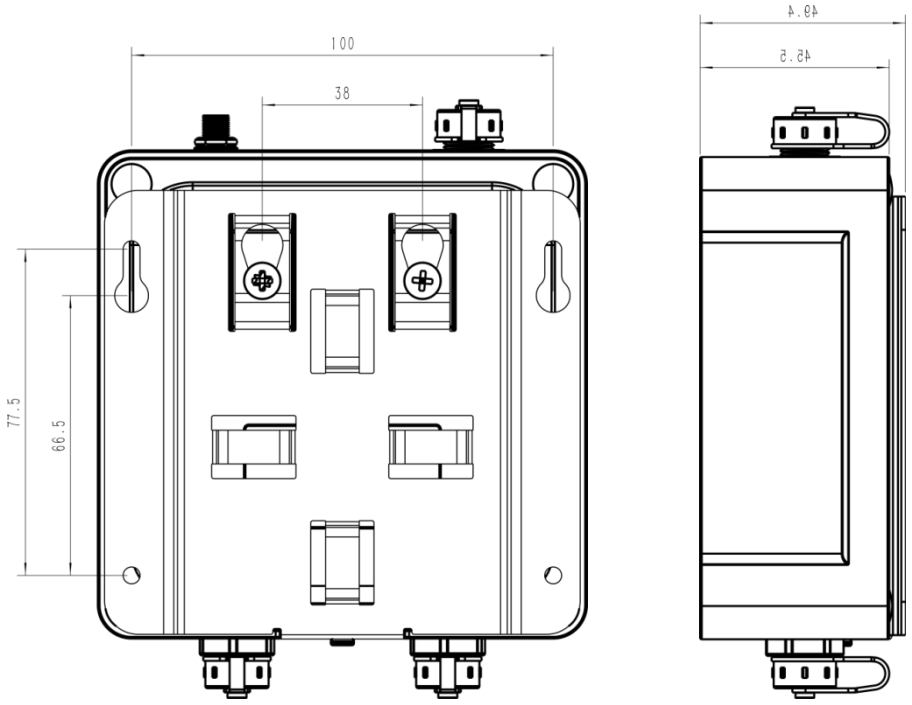
◆ Optional Sensor

Model	PS02	PS03
Process Connection	G 1/2"	
Cable Length	3m	
Pressure Type	Gauge pressure	
Range	0~1600kPa（16 Bar）	
Accuracy	±0.5% FS	

Resolution	1kPa	
Overload Pressure	200% FS	
Long-term Stability	±0.3% FS/Year	
Interface Type	M12 A-Coded Female	Unterminated

◆ Dimensions (mm)




100
38
77.5
66.5
49.4
45.5

AI Version：

