

U-7504M

OPC UA I/O Module
with 4-ch DI, 4-ch AI, 4-ch AO,
and 2-port Ethernet Switch

Features

- Support OPC UA Server / Client and MQTT Client Protocol
- Support RESTful API via HTTP and HTTPS
- Support to Execute OPC UA, MQTT and RESTful API Simultaneously
- Support Scaling For Analog Signal Converting
- Support Logic Function Rule Setting: IF, THEN, ELSE
- Support Schedule: to Execute the Set Rules at a Specific Time.
- Support I/O Trigger Message: Message ➔ File (CSV) or Line for Device Tracking
- Support IoTstar Cloud Management Software.
- Built-in Web Server to Provide the Web User Interface
- I/O Channels: 4-ch DI, 4-ch AI, 4-ch AO
- Dual-port Ethernet Switch for Daisy-Chain Topology
- IEEE 802.3af-compliant Power over Ethernet (PoE)

Introduction

U-7504M is a UA I/O module that provides 4 digital input, 4 analog input, and 4 analog output channels. It has a built-in two-port Ethernet switch to implement daisy-chain topology. The cabling is much easy and can reduce the total cable and switch cost. It follows IEEE 802.3af (Class 2) compliant Power over Ethernet (PoE) specification. It allows receiving power from PoE enabled network by Ethernet pairs. This feature provides greater flexibility and efficiency to simplify system design, save space, and reduce wirings and power sockets. It provides a Web UI to configure/control/monitor the modules, connections, and I/O status via a web browser. It is easy, fast, and no extra APP needed.

In industrial communication, UA I/O provides OPC UA Server / Client, MQTT Client and RESTful API protocols (can execute all communications at the same time.). Users can choose the networking mode according to their cases. And to transmit the values of the built-in I/O channels to the cloud system or field control system for displaying, analysis or strategy. Support Scaling. Let the analog signal be converted into a more readable value. Support logic function rule setting IF, THEN, ELSE, can set up logical condition/action for I/O and virtual point; Provide schedule function to execute the set rules at a specific time; and support RESTful API function, can read/write I/O and virtual point through HTTP or HTTPS.

Software Specifications

Protocol	
OPC UA Server / Client	• OPC Unified Architecture: 1.02 • Core Server Facet • Data Access Server Facet • Method Server Facet • UA-TCP UA-SC UA Binary • User Authentication: - Anonymous - Username/Password - X.509 Certificate • Security Policy: - None - Basic128Rsa15 (Sign, Sign & Encrypt) - Basic256 (Sign, Sign & Encrypt) - Basic256Sha256 (Sign, Sign and Encrypt) - Aes128Sha256RsaOaep (Sign, Sign & Encrypt) - Aes256Sha256RsaPss (Sign, Sign & Encrypt) • Can Execute with MQTT and RESTful API Communication Simultaneously • Max. Session Connections: 3 (Server only)
MQTT Client	• Connect to the MQTT Broker to read or control the I/O channel value by the publish/subscribe messaging mechanism. (MQTT Ver. 3.1.1; TLS Ver. 1.2)
RESTful API	• User can read/write the I/O & Virtual points through HTTP and HTTPS.

Function	
Web Interface for Configuration	• The system operation can be performed through the browser without installing software tools. • Use AES 256 encryption algorithm to encrypt web page setting data for general communication. • HTTPS upgrades the security of web communication.
Scaling	• Convert the analog signal to a more readable value. • Function is only available for modules with AI/O.
Security	• Infromation Security: Provide HTTPS, Port Binding , Allowlist, ICMP drop functions. • Data security: Provide Certificate (X.509), Communication Encryption (SSL/TLS) functions.
Rule Setting	• Provide simple logic condition rule setting, let UA I/O do automatic condition judgment and action control, to achieve simple intelligentization.
Schedule	• Provide schedule function to execute the set rules at a specific time.
Event Log	• When the I/O value changes, record the current I/O value for easy device tracking in the future.
IoTstar Setting	• Support IoTstar cloud management software developed by ICP DAS.

System Specifications

CPU Module	
CPU	32-bit CPU (400 MHz)
Watchdog Timer	Module, Communication (Programmable)
Isolation	
2-way Isolation	I/O: 2500 VDC
EMS Protection	
EFT (IEC 61000-4-4)	±2 kV for Power Line
ESD (IEC 61000-4-2)	±4 kV Contact for each terminal ±8 kV Air for random point
Surge (IEC 61000-4-5)	±2 kV for Power Line
LED Indicators	
Status	Run, Ethernet, I/O
Ethernet	
Ports	2 x RJ-45, 10/100 Base-TX, Swtich Ports
PoE	Yes
LAN bypass	Yes
Security	ID, Password and IP Filter

Power	
Reverse Polarity Protection	Yes
Consumption	8.2 W
Powered from PoE	IEEE 802.3af, Class3
Powered from Terminal Block	+12 ~ +48 VDC
Mechanical	
Dimensions (mm)	97 x 120 x 47 (W x L x H)
Installation	DIN-Rail mounting
Environment	
Operating Temperature	-25 °C ~ +75 °C
Storage Temperature	-30 °C ~ +80 °C
Humidity	10 ~ 90% RH, Non-condensing

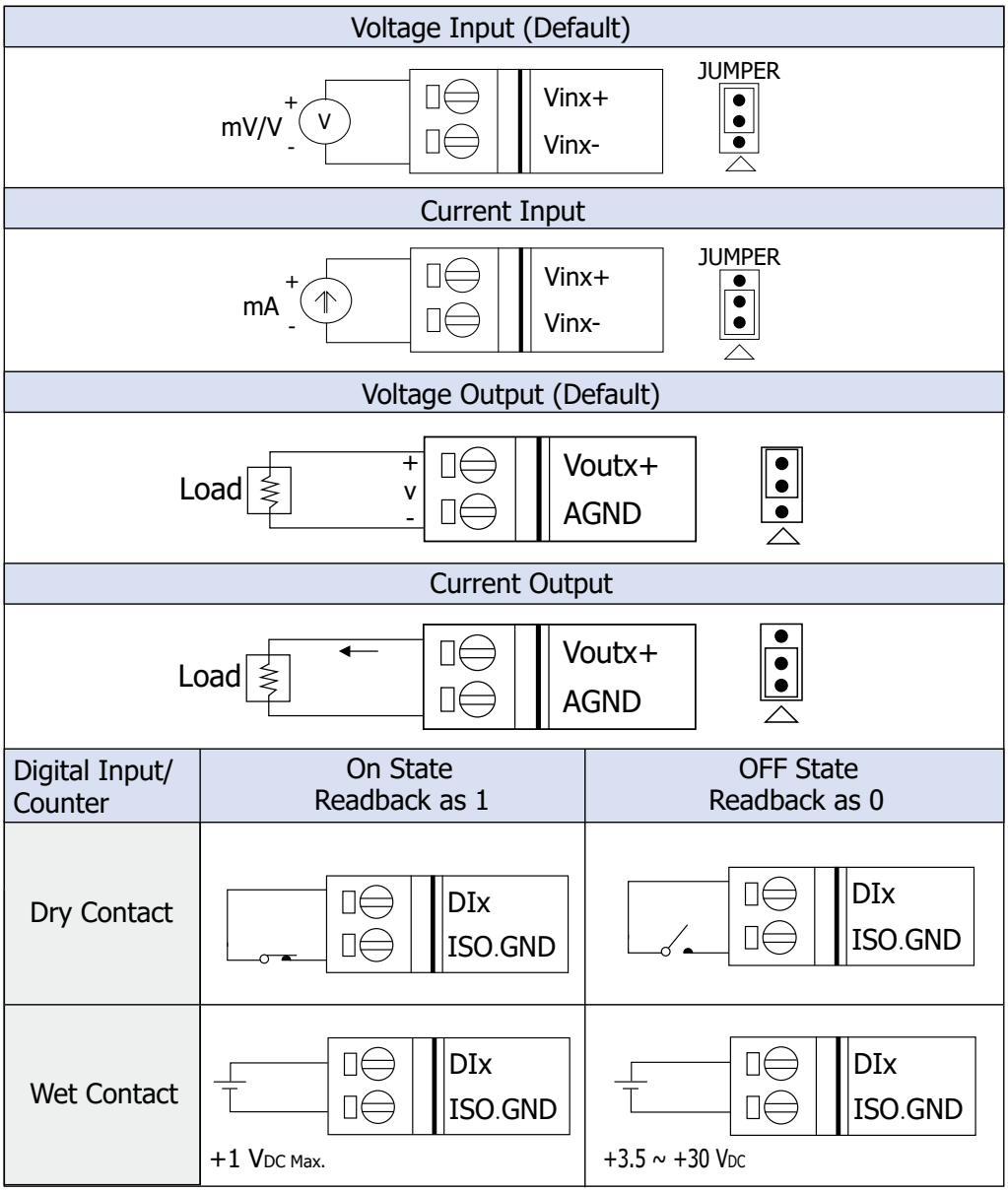
I/O Specifications

Analog Input	
Channels	4 (Differential)
Type	Voltage, Current
Range	±500 mV, ±1 V, ±5 V, ±10 V 0 to 20 mA, ±20 mA, 4 to 20 mA (Jumper Selectable)
Resolution	16-bit
Accuracy	Normal Mode: ±0.1% Fast Mode: ±0.5% or better
Sampling Rate	Normal Mode: 10 samples/second (Total) Fast Mode: 50 samples/second (Total)
Input Impedance	Voltage: 2 MΩ Current: 125 Ω
Common Mode Rejection	86 dB (min.)
Normal Mode Rejection	100 dB
Common Voltage Protection	±200 VDC
Overvoltage Protection	240 Vrms
Overcurrent Protection	50 mA at 110 VDC (max.)
Individual Channel Configuration	Yes
Open Wire Detection	Yes
Zero Drift	±20 μV/°C
Span Drift	±25 ppm/°C
Isolation	±400 VDC, Virtual Channel to Channel Isolation

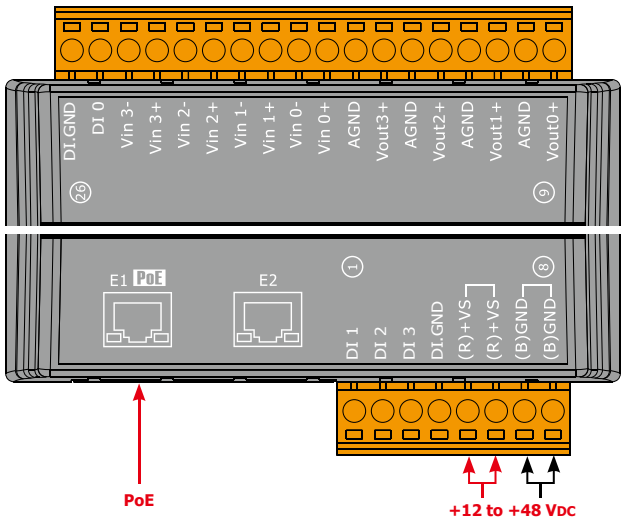
Analog Output	
Channels	4
Type	Voltage, Current
Range	+0 to +5 VDC, ±5 VDC, +0 to +10 VDC, ±10 VDC, 0 to 20 mA, 4 to 20 mA (Jumper Selectable)
Resolution	12-bit
Accuracy	±0.1% of FSR
Open Wire Detection	For 4 ~ 20 mA only
Voltage Output Capability	10 V @ 20 mA
Current Load Resistance	400 Ω
Individual Channel Configuration	Yes
Power-on Value	Programmable
Safe Value	Programmable

Digital Input/Counter	
Channels	4
Type	Dry Contact Wet Contact
ON Voltage Level	Dry: Open Wet: +1 VDC (max.)
OFF Voltage Level	Dry: Close to GND Wet: +3.5 to +30 VDC
Max. Count	4,294,967,295 (32-bit) (⚠ The counter will reset to 0 and continue counting after reaching the maximum value.)
Frequency	100 Hz
Min. Pulse Width	5 ms
Effective Distance	500m (max.)
Overvoltage Protection	+30 VDC

Wire Connections

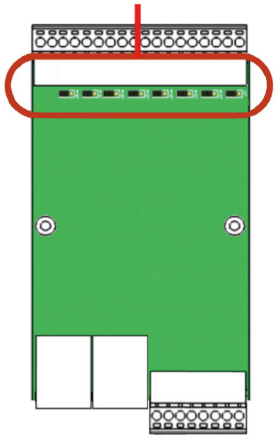


Pin Assignments



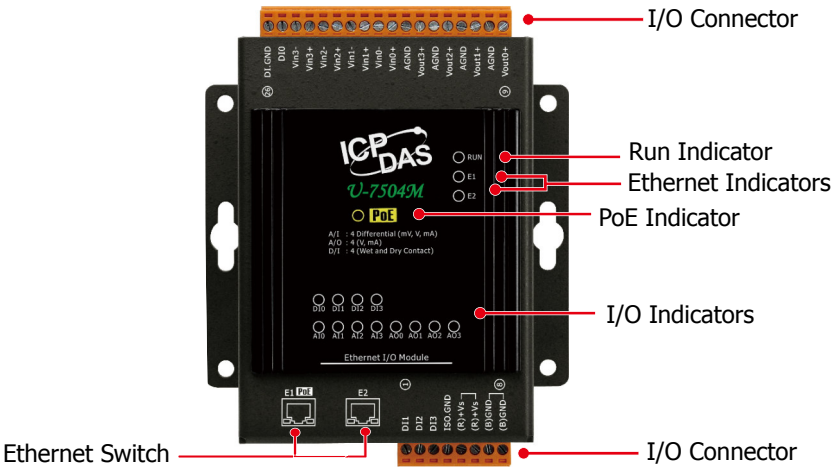
Jumper Location

U-7504M								
Channel	Vin3	Vin2	Vin1	Vin0	Vout3	Vout2	Vout1	Vout0
Jumper	J4	J3	J2	J1	J8	J7	J6	J5
Location	Jumper →							

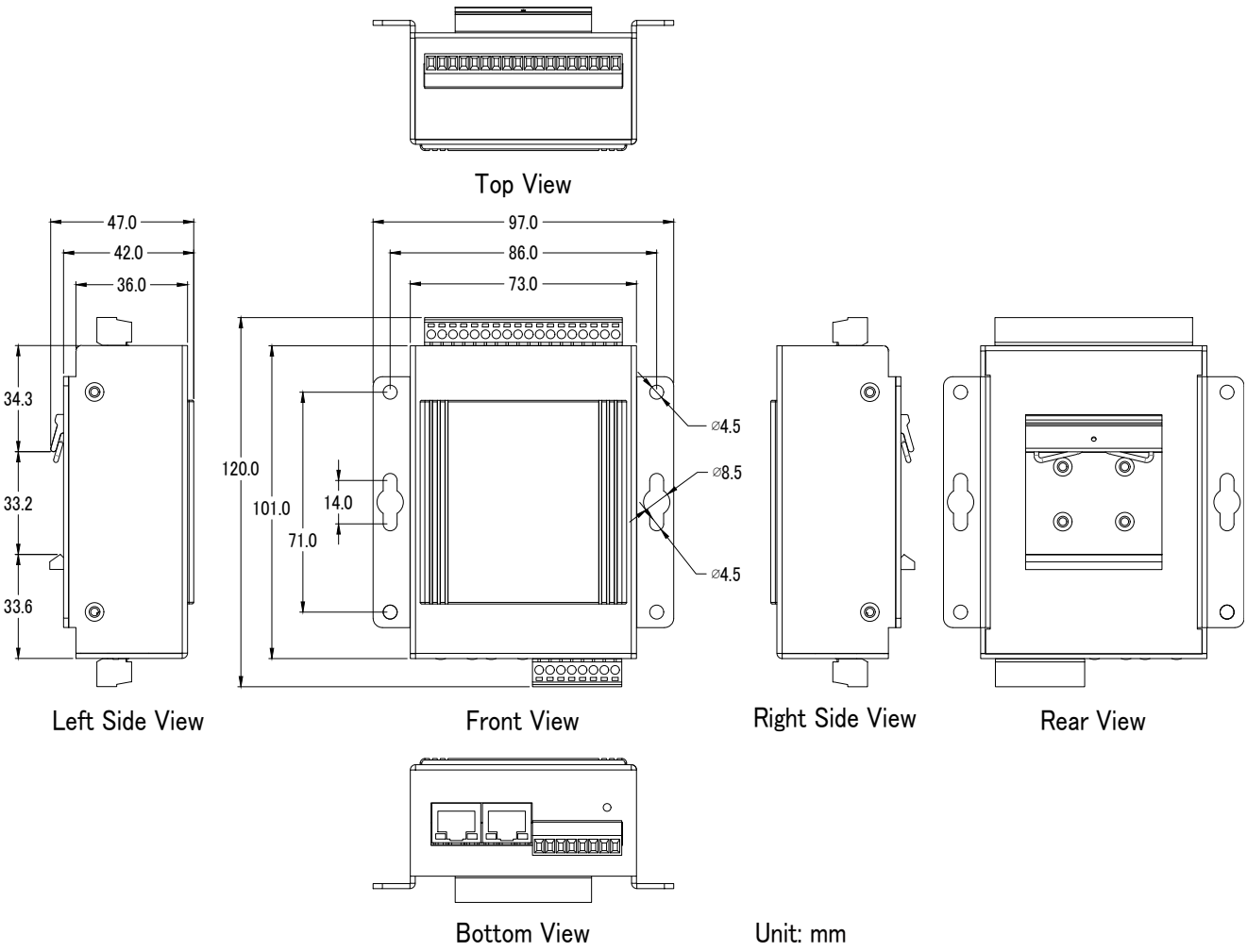


(Remove the top case and upper board)

Appearance



Dimensions (mm)



Ordering Information

U-7504M CR	OPC UA I/O Module with 4-ch DI, 4-ch AI, 4-ch AO, and 2-port Ethernet Switch. (RoHS)