

RTU-EN01



Instruction Sheet

安裝說明 安 装 说 明

Modbus TCP Remote I/O Communication Module

Modbus TCP 遠端 I/O 通訊模組

Modbus TCP 远程 I/O 通讯模块



⚠ Warning

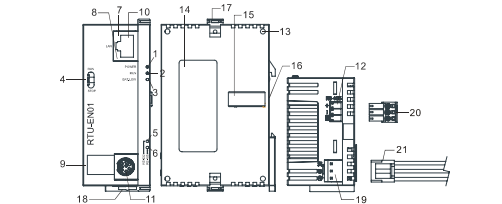
- This instruction sheet only provides introductory information on electrical specification, installation and wiring.
- Switch off the power before wiring. DO NOT touch any terminal when the power is switched on.
- RTU-EN01 is an OPEN-TYPE device and therefore should be installed in an enclosure free of airborne dust, humidity, electric shock and vibration. The enclosure should prevent non-maintenance staff from operating the device (e.g. key or specific tools are required to open the enclosure) in case danger and damage on the device may occur.
- DO NOT touch the internal circuit within one minute after the power supply is cut off.
- DO NOT connect input AC power supply to any of the I/O terminals, otherwise serious damage may occur. Check all the wiring again before switching on the power and DO NOT touch any terminal when the power is switched on. Make sure the ground terminal is correctly grounded in order to prevent electromagnetic interference.

Introduction

Features

- The smart PLC functions support counter, timer and RTC and are able to operate independently through easy setup without control of PLC MPU or programming.
- Able to auto-detect 10/100 Mbps transmission speed; MDI/MDI-X auto-detect.
- Supporting 16 digital I/O modules (max. 256 I/O points) and 8 analog I/O modules.
- Supporting maximum 16 Modbus TCP connections.
- Supporting Modbus TCP/Modbus gateway (supporting Master mode, able to connect to max. 32 devices).
- Parameters can be set up on webpage.

Product Profile & Outline



1. POWER indicator	8. SPEED indicator	15. Right-side module connection port
2. RUN indicator	9. Digital display	16. DIN rail (35mm)
3. BAT.LOW indicator	10. Ethernet communication port	17. Right-side module fixing clip
4. RUN / STOP switch	11. RS-232 communication port	18. DIN rail clip
5. RS-232 indicator	12. RS-485 communication port	19. Power supply port
6. RS-485 indicator	13. Right-side module positioning hole	20. 3P terminal block (standard accessory)
7. LINK / ACK indicator	14. Nameplate	21. Power supply connection cable (standard accessory)

Specifications

Ethernet Port

Interface	RJ-45 with Auto MDI/MDIX
Transmission method	802.3, 802.3u
Transmission cable	Category 5e, 100m (Max)
Transmission speed	10/100 Mbps Auto-Detection
Network protocol	ICMP, IP, TCP, UDP, DHCP, NTP, Modbus TCP, HTTP

RS-485 Port

Interface	3 PIN feed-through terminal
Transmission method	RS-485
Transmission distance	1,200m
Transmission speed	110, 150, 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, 115,200 bps
Communication format	Stop bit: 1, 2; Parity bit: None, Odd, Even; Data bit: 7, 8
Communication protocol	Modbus ASCII / Modbus RTU

RS-232 Port

Interface	Mini Dim
Transmission method	RS-232
Transmission speed	19,200 bps
Communication format	Stop bit: 1; Parity bit: None; Data bit: 8
Communication protocol	Delta Configuration
Transmission cable	DVPACAB215 / DVPACAB230 / DVPACAB2A30

Electrical Specification

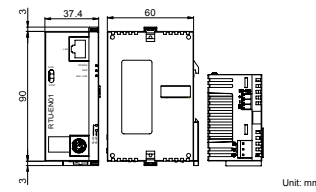
Power supply voltage	24VDC (-15% ~ 20%) (with DC input polarity reverse protection)
Power fuse capacity	1.85A/30VDC, Polyswitch
Power consumption	2W
Insulation voltage	500VDC
Weight	116g

Environment

Noise immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line ±2kV, Digital Input: ±2kV, Communication I/O: ±2kV RS (IEC 61131-2, IEC 61000-4-3): 80MHz ~ 100MHz, 10V/m, 1.4GHz ~ 2.0GHz, 10V/m Conducted Susceptibility Test (EN61000-4-6, IEC61131-2-9.10): 150kHz ~ 80MHz, 3V/m Surge Test (B-wave IEC61132-2, IEC61000-4-5): Power line 0.5KV DM, Ethernet 0.5KV CM, RS-485 0.5KV CM
Operation/storage	Operation: 0°C ~ 55°C (temperature), 5 ~ 95% (humidity), pollution degree 2 Storage: -25°C ~ 70°C (temperature), 5 ~ 95% (humidity)
Shock/vibration immunity	International standards: IEC61131-2, IEC68-2-6 (TEST Fc)/IEC61131-2 & IEC 68-2-27 (TEST Ea)
Certificates	CE, RoHS

Installation

Dimension



Unit: mm

RUN / STOP Switch

Status	Explanation
RUN	1. RUN indicator on RTU-EN01 is ON. 2. Analog I/O module in RUN status. 3. Smart PLC function is running.
RUN → STOP	1. Analog I/O module switches from RUN to STOP status. 2. Y points on digital output module are all OFF.
STOP	1. RUN indicator on RTU-EN01 is OFF. 2. Analog I/O module in STOP status. 3. Smart PLC function stops.
STOP → RUN	1. RTU-EN01 re-detects the number of points in right-side module. 2. Analog I/O module switches from STOP to RUN status.

RJ-45 PIN Definition

PIN	Signal	Definition	PIN	Signal	Definition
1	Tx+	Positive pole for data transmission	5	--	N/C
2	Tx-	Negative pole for data transmission	6	Rx-	Negative pole for data receiving
3	Rx+	Positive pole for data receiving	7	--	N/C
4	--	N/C	8	--	N/C

RS-232 PIN Definition

PIN	Signal	Definition	PIN	Signal	Definition
1	--	N/C	5	Tx	Transmission data
2	--	N/C	6	--	N/C
3	--	N/C	7	--	N/C
4	Rx	Reception data	8	GND	Ground

Feed-through Terminal PIN Definition

PIN	Signal	Definition
1	SG	Ground of data
2	D-	Negative pole for data
3	D+	Positive pole for data

LED Indicators & Trouble-Shooting

There are 7 LED indicators and a digital display on RTU-EN01. POWER LED displays the status of the power supply, RS-232 LED, RS-485 LED, LINK/ACT LED and SPEED LED display the connection status of the communication. The digital display shows the address of RTU-EN01, error messages and errors from the slave.

POWER LED

LED status	Indication	Solution
OFF	Power supply is abnormal.	Check if the power supply of RTU-EN01 is normal.
Green light ON	Power supply is normal.	--

RUN LED

LED status	Indication	Solution
OFF	RTU-EN01 in STOP status	1. Check if the RUN/STOP switch is switched to RUN. 2. Check if an error is displayed on the digital display
Green light ON	RTU-EN01 in RUN status	--

BAT.LOW LED

LED status	Indication	Solution
OFF	The battery is normal.	--
Red light flashes	The battery is in low voltage.	1. Switch battery. 2. Re-power RTU-EN01. If the error still exists, return your RTU-EN01 to the manufacturer for further solutions.

RS-232 LED

LED status	Indication	Solution
OFF	No communication or abnormal RS-232 connection.	If occurring during communication, check if the RS-232 port on RTU-EN01 is normally connected.
Yellow light steady ON	Abnormal RS-232 connection	Check if the RS-232 port on RTU-EN01 is normally connected.
Yellow light flashes	Normal RS-232 connection	--

RS-485 LED

LED status	Indication	Solution
OFF	No communication or abnormal RS-485 connection	1. If occurring during communication, check if the RS-485 port on RTU-EN01 is normally connected. 2. Make sure at least 1 node on network can communicate normally.
Yellow light steady ON	Abnormal RS-485 connection	Switch D+ and D-.
Yellow light flashes	Normal RS-485 connection	--

LINK / ACT LED

LED status	Indication	Solution
OFF	No power supply or network connection	1. Check the power of RTU-EN01 and make sure the network connection is normal. 2. Re-power RTU-EN01. If the error still exists, return your RTU-EN01 to the manufacturer for further solutions.
Green light ON	The connection is normal, but no data transmission	--
Green light flashes	Data transmission is normal.	--

SPEED LED

LED status	Indication	Solution
OFF	Ethernet communication speed = 10Mbps	1. Check if RTU-EN01 is connected to 100Mbps Ethernet. 2. Check if the network is connected and connected by Category 5e cable. 3. Re-power RTU-EN01. If the error still exists, return your RTU-EN01 to the manufacturer for further solutions.
Yellow light ON	Ethernet communication speed = 100Mbps	--

Codes in Digital Display

Code	Status	Indication	Solution
0	FF	ON	Node address of RTU-EN01 under normal operation
F0	Flash	Returning to default setting	--
F1	Flash	RTU-EN01 is booting	--
F2	Flash	Power supply in low voltage	Check if the power supply is normal.
F3	Flash	Internal memory error	1. Check if the settings of Smart PLC are incorrect. 2. Re-power RTU-EN01. If the error still exists, try step 3.
F4	Flash	Internal error caused by manufacturing in the factory	3. Re-set RTU-EN01. If the error still exists, return it to the manufacturer for further solutions.
F5	Flash	Network connection error	Check if RTU-EN01 is normally connected to the network.
F6	Flash	Insufficient TCP connection	Check if the number of connections exceeds the maximum.
F7	Flash	RS-485 setting error	Check if the RS-485 communication format is correct.
F8	Flash	IP setting error	1. DHCP request failure 2. IP setting error 3. MASK setting error 4. Gateway does not exist in the same subnet. 5. Returning to default setting
F9	Flash	Right-side module error	Check if the configuration of the right-side module has been modified. If the error still exists, check if the number of I/O points exceeds the allowed range and if the number of analog I/O modules exceeds 8.
FA	Flash	Syntax check error	1. Check if errors occur in TS, CS, AL, RT registers. 2. Read the BR#85 where the error occurs.
04	Flash	Slave error from the station	1. Check if RTU-EN01 and RS-485 is connected normally. 2. Check if the series transmission speed is consistent with that of other nodes on the network.
0b	Flash	No response from station	--

⚠ 注意事項

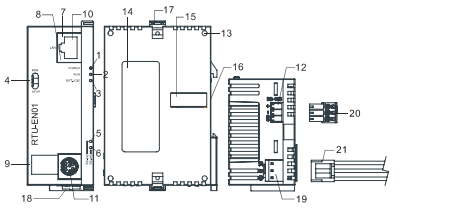
- 此安裝手冊只提供電氣規格、一般規格、安裝及配線等。
- 配線時請務必關閉電源，請勿在上電時觸摸任何端子。
- 本機為開放型 (OPEN TYPE) 機殼，因此使用者使用本機時，必須將之安裝於其防護，防塵及免於電擊 / 衝擊意外之屏蔽配線箱內，另必須具備保護措施 (如：特種之工具或鑰匙才可打開)，防止非維護人員操作造成意外衝擊本機，造成危險及損壞。
- 輸入電源切斷後，一分鐘之內，請勿觸摸內部電路。
- 交流輸入電源不可連接於輸入 / 輸出信號端，否則可能造成嚴重損壞，請在上電前再次確認電源配線，且請勿在上電時觸摸任何端子。本體上的接地端子務必正確的接地，以提高產品抗雜訊能力。

產品簡介

功能特色

- Smart PLC 功能，支援計數器、計時器、RTC，不需 PLC 主機控制或編程，經由簡易設定即能獨立運作。
- 自動偵測 10/100 Mbps 傳輸速率；MDI/MDI-X 自動偵測。
- 最大支援 16 台數位輸入/輸出模組 (最多可達 256 點) 與 8 台類比輸入/輸出模組。
- 最大支援 16 組 Modbus TCP 連線。
- 支援 Modbus TCP/Modbus 閘道器 (支援 Master 模式，最多可以連接 32 台裝置)。
- 可透過網頁設定參數。

產品外觀



1. POWER 指示燈	8. SPEED 指示燈	15. 右側模組連接埠
2. RUN 指示燈	9. 數位顯示器	16. DIN 軌槽 (35mm)
3. BAT.LOW 指示燈	10. Ethernet 通訊埠	17. 右側模組固定扣
4. RUN/STOP 開關	11. RS-232 通訊埠	18. DIN 固定扣
5. RS-232 指示燈	12. RS-485 通訊埠	19. 電源輸入口
6. RS-485 指示燈	13. 右側模組定位孔	20. 3P 駁落式端子 (標準附件)
7. LINK/ACK 指示燈	14. 銘牌說明	21. 電源輸入連接線 (標準附件)

功能規格

Ethernet 連接器

接口	RJ-45 with Auto MDI/MDIX
傳輸方式	802.3, 802.3u
傳輸電纜	Category 5e - 100 公尺 (Max)
傳輸速率	10/100 Mbps Auto-Detection
通訊協定	ICMP - IP - TCP - UDP - DHCP - NTP - Modbus TCP - HTTP

RS-485 連接器

接口	歐式端子 3 PIN
傳輸方式	RS-485
傳輸距離	1,200m
傳輸速率	110 - 150 - 300 - 600 - 1,200 - 2,400 - 4,800 - 9,600 - 19,200 - 38,400 - 57,600 - 115,200 bps
通訊格式	Stop bit: 1, 2; Parity bit: None, Odd, Even; Data bit: 7, 8
通訊協定	Modbus ASCII / Modbus RTU

RS-232 連接器

接口	Mini Dim
傳輸方式	RS-232
傳輸速率	19,200 bps
通訊格式	Stop bit: 1; Parity bit: None; Data bit: 8
通訊協定	Delta Configuration
傳輸電纜	DVPACAB215 / DVPACAB230 / DVPACAB2A30

電氣規格

電源電壓	24VDC (-15% ~ 20%) (具直流輸入電源反極性保護)
電源保險絲容量	1.85A/30VDC，可恢復式 (Polyswitch)
消耗電力	2W
絕緣電壓	500VDC
重量	116g

環境規格

通訊電流	ESD (IEC 61131-2, IEC 61000-4-2): 8KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line ±2kV, Digital Input: ±2kV, Communication I/O: ±2kV RS (IEC 61131-2, IEC 61000-4-3): 80MHz ~ 100MHz, 10V/m, 1.4GHz ~ 2.0GHz, 10V/m Conducted Susceptibility Test (EN61000-4-6, IEC61131-2-9.10): 150kHz ~ 80MHz, 3V/m Surge Test (B-wave IEC61132-2, IEC61000-4-5): Power line 0.5KV DM, Ethernet 0.5KV CM, RS-485 0.5KV CM
操作/儲存環境	操作: 0°C ~ 55°C (溫度), 5 ~ 95% (濕度), 污染等級 2 儲存: -25°C ~ 70°C (溫度), 5 ~ 95% (濕度)
耐震動衝擊	國際標準規範 IEC61131-2, IEC68-2-6 (TEST Fc) / IEC61131-2 & IEC 68-2-27 (TEST Ea)
標準	CE, RoHS

安裝

外觀

