LLD-Modbus32E-01 Ethernet Modbus I/O Controller (Modbus-TCP)
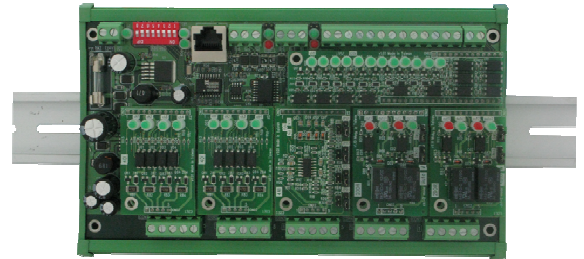
- ☑ **Standard Modbus-TCP/Modbus-RTU communication protocol**
- ☑ **24V DC/AC power supply model**
- ☑ **10/100 Mbps Ethernet interface**
- ☑ **Expandable I/O module for various applications**
- ☑ **Connect and control over 2000 points**
- ☑ **Provide relay digital output control (Relay DO)**
- ☑ **Provide open collector digital output control (Open Collector DO)**
- ☑ **Provide optically isolated digital input control interface (Isolated DI)**
- ☑ **Provide 12-bit simulation signal input control interface (AI)**
- ☑ **Provide 12-bit simulation signal output control interface (AO)**
- ☑ **RS-485 remote equipment data transmission communication, isolation protection (optional)**
- ☑ **Expandable DDC Function**

Product Introduction

LLD-Modbus32E-01 is a DAM control module with flexibility and high performance-to-price ratio. It has commonly used interface for control and measurement data acquisition with Digital Input/Output and Analog Input/Output. The user, depending on application requirements, can select one to six expansion I/O modules (ModIO module series) of different function, accommodating up to 32 control points. Besides, LLD-Modbus32E-01 is provided with standard Modbus-TCP (Ethernet) and Modbus-RTU (RS-485) communication protocol to communicate with remote unit.

☒ Flexible I/O interface

LLD-Modbus32E-01 provides 5+1 I/O module expansion functions and obtains different I/O combination through installation of different modules, and make control and data acquisition functions to be more flexible to satisfy different needs.

The six main I/O modules on the unit can freely install Digital I/O, Analog I/O and relay control module, and provide up to 32 control points.

☒ Modbus Communication Protocol

LLD-Modbus32E-01 has a 10/100 Mbps Ethernet interface with Modbus-TCP slave communication protocol. Two RS-485 interfaces can be defined as Modbus-RTU slave functions that can be connected to a remote host or HMI.

☒ Expandable DDC Function (Direct Digital Control)

LLD-Modbus32E-01 could expand DDC function for input reading、output control、math operations、comparison、time、HVAC、PID…ect. over 50 common functions。allowing the user to directly develop and debug DDC program with the online menu from the management tool。You can also define an 8-digit password to protect the on-site operating DDC program when you process the upload/download and debug program.

☒ Diverse Power Configuration

LLD-Modbus32E-01's working voltage could be 24V AC or 24V DC。There is a set of design 15V@200mA DC output in LLD-Modbus32E-01 which is mainly used for power supply of various types of sensors。
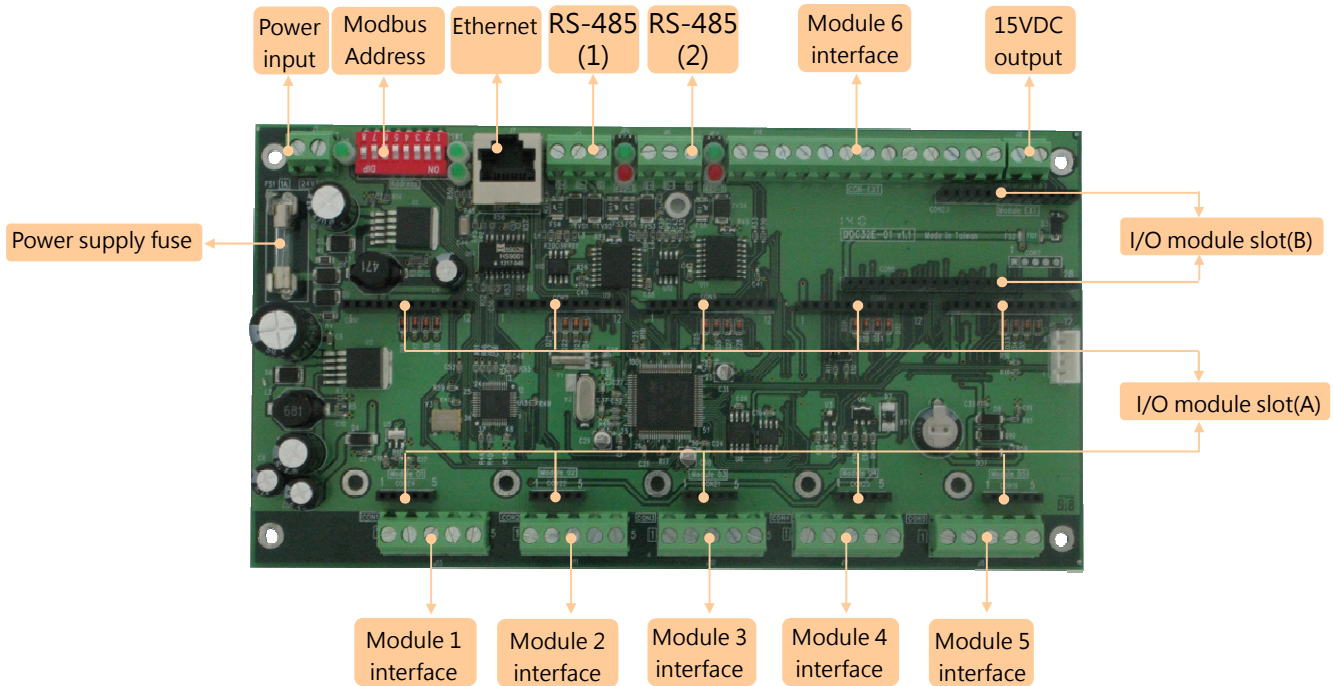
The combination characteristics of the 15V DC output and 24V AC input as working voltage can save part of the power converter planning and configuration costs in monitoring system , such as central air conditioning monitoring applications.

☒ Easy Management Tool

LLD-Modbus32E-01 has a simple management tool, window and menu design, easy for setting up LLD-Modbus32E-01. It also provides real time operating status monitoring function, allowing remote monitoring for operating status at each point.

☒ Remote Upgrade Function

The user can monitor computer via the management tool specialized for LLD-Modbus32E-01 and conduct remote software upgrade via Ethernet or RS-485 communication port (need to be defined as Modbus-Slave), which can reduce system operating cost.

LLD-Modbus32E-01 MCU Carrier
Exterior Description

Power input | Modbus Address | Ethernet | RS-485 (1) | RS-485 (2) | Module 6 interface | 15VDC output

Power supply fuse

I/O module slot(B)

I/O module slot(A)

Module 1 interface | Module 2 interface | Module 3 interface | Module 4 interface | Module 5 interface

System Core
▹ MCU：ST STM32F207VE (Cortex™-M3 32-bit)
▹ Memory：512KB FLASH, 128KB SRAM, 8KB FRAM, 2048KB SPI FLASH

Network interface
▹ Quantity：1
▹ Type：10/100 BaseT Ethernet
▹ Connector：RJ45

RS-485 Serial Port interface
▹ Quantity：2
▹ RS-485 signal：Data+, Data-, GND
▹ Protection：15KV ESD and 400W surge protection, 2KVrms isolation protection **(Optional)**
▹ Connector：5.00mm 3-pin terminal block
▹ Baud Rate：4,800 ~ 115,200 bps
▹ Parity：None, Even, Odd
▹ Data Bits：8
▹ Stop Bit：1, 2 bits

I/O Module Expansion Slot (A)
▹ Quantity：5
▹ Connector A：2.54mm 12-pin　pin header
▹ Connector B：2.54mm 5-pin　pin header
▹ Connector C：5.00mm 5-pin terminal block

I/O Module Expansion Slot(B)
▹ Quantity：1
▹ Connector A：2.54mm 22-pin　pin header
▹ Connector B：2.54mm 13 pin　pin header
▹ Connector C：5.00mm 13-pin terminal block

Mechanism
▹ Control panel dimension：200 x 107 x 23 mm
▹ Installed IO module：200 x 107 x 27 mm
▹ Installed IO module and Din-Rail carrier：202 x 121 x 40 mm

Power
▹ Working voltage：24V AC/DC
▹ Power Connector：2-pin 5.00 mm terminal block
▹ Protection：1A fuse
▹ Power consumption：0.5~11W (depending on installed ModIO module)

Others
▹ LED indicator：power, serial port
▹ DIP Switch：MODBUS Slave 定址& RS-485 type
▹ Applicable temperature：0~50℃
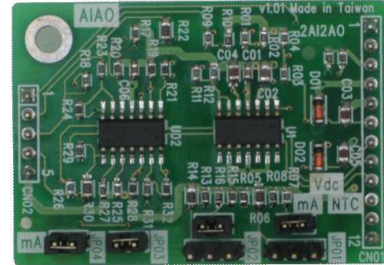▹ Applicable humidity：20%~80% RHG
▹ Certification：CE/FCC

Specialized I/O Expansion Module (A)
Common Specifications

▷ Dimensions : 35 x 50mm

▷ Fixation hole : 3.5mm x 1

▷ Pin header A : 2.54mm 12-pin x 1 (connect to carrier MCU)

▷ Pin header B : 2.54mm 5-pin x 1 (connect to exterior connector of carrier)

AI/AO Module (ModIO-AIO)
simulation input/output control(analog input/output)

▷ AI Quantity : 2 points

▷ AO Quantity : 2 points

▷ Signal type : 4~20mA / 0-10VDC / NTC (by jumper)

▷ Resolution : 12-bit

▷ Protection : OP input/output buffer

▷ Installation limit : 1 piece (each MCU carrier is only allowed to install one piece of ModIO-AIO)

AI Module (ModIO-AI)
simulation input control(analog input)

▷ Quantity : 4 points

▷ Signal type : 4~20mA / 0-10VDC / NTC (by jumper)

▷ Resolution : 12-bit

▷ Protection : OP input buffer

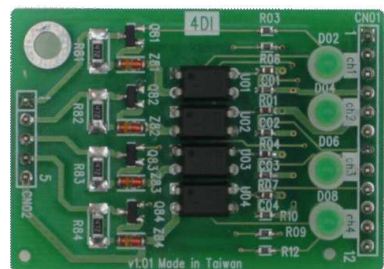▷ Installation limit : 2 pieces (each MCU carrier is only allowed to install 2 pieces of ModIO-AI)

AO Module (ModIO-AO)
Simulation output control(analog output)

▷ Quantity : 4 points

▷ Signal type : 4~20mA or 0-10VDC(by jumper)

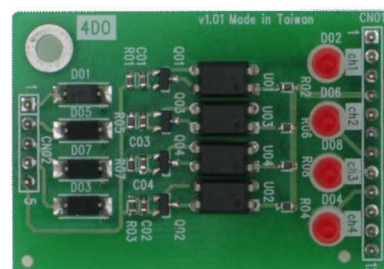▷ Resolution : 12-bit

▷ Protection : OP output buffer

DI Module (ModIO-DI-S)
digital input control(isolated digital input)

▷ Quantity : 4 points

▷ Model : wet contact / sink mode

▷ Input voltage range : 5~24VDC

▷ Input protection : 2000 Vrms optically isolation protection

▷ LED indicator : DI status

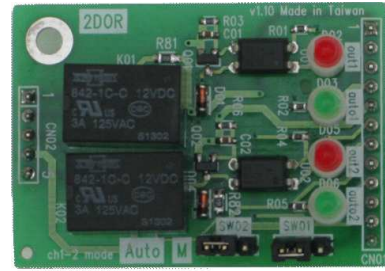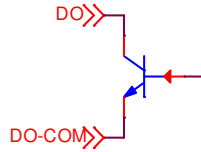## DO Module A (ModIO-DO-S)
Digital output control(open collector output)

▷ Quantity : 4

▷ Signal type : Open Collector

▷ Load capacity : 5~30 VDC @ 200mA

▷ Signal protection : 2000 Vrms optically isolated & 400W surge protection

▷ LED indicator : DO status

DO Module B (ModIO-Relay)
Relay output control (relay output)

- Quantity : 2
- Signal type : SPDTRelay

  Ch-A : N.O. / COM

  Ch-B : N.O./ N.C. / COM
- Control model : automatic (by S/W) and manual control
- Connection point capacity : 1A@120VAC, 2A@24VDC
- Signal protection : 2000 Vrms optically isolation & 400W surge protection
- LED indicator : DO status
- Manual/automatic control and status monitoring (by jumper)

Specialized I/O Expansion Module (B)

Common Specifications

- Fixation hole : 3.5 mm x 1
- Pin header A : 2.54 mm 22-pin x 1 (connect to carrier MCU)
- Pin header B : 2.54 mm 13-pin x 1 (connect to the exterior connector of carrier)

Expansion DI Module (ModIO-12DI)
Digital output control (isolated digital input)
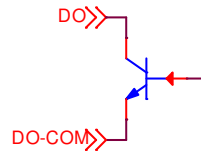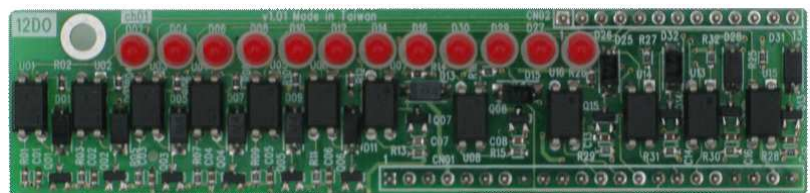
- Quantity : 12
- Model : wet contact / sink mode
- Input voltage range : 5~24VDC
- Input protection : 2000 Vrms optically isolation protection
- LED indicator : DI status
- Dimensions : 25 x 100mm

Expansion DO Module (ModIO-12DO)
Digital output control (isolated digital Output)

- Quantity : 12
- Signal type : Open Collector
- Load capacity : 5~30 VDC @ 200mA
- Signal protection : 2000 Vrms optically isolation protection
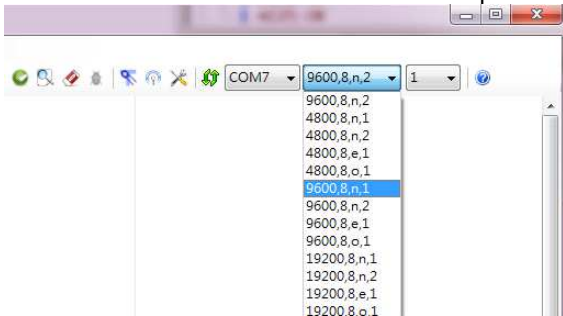- LED indicator : DO status
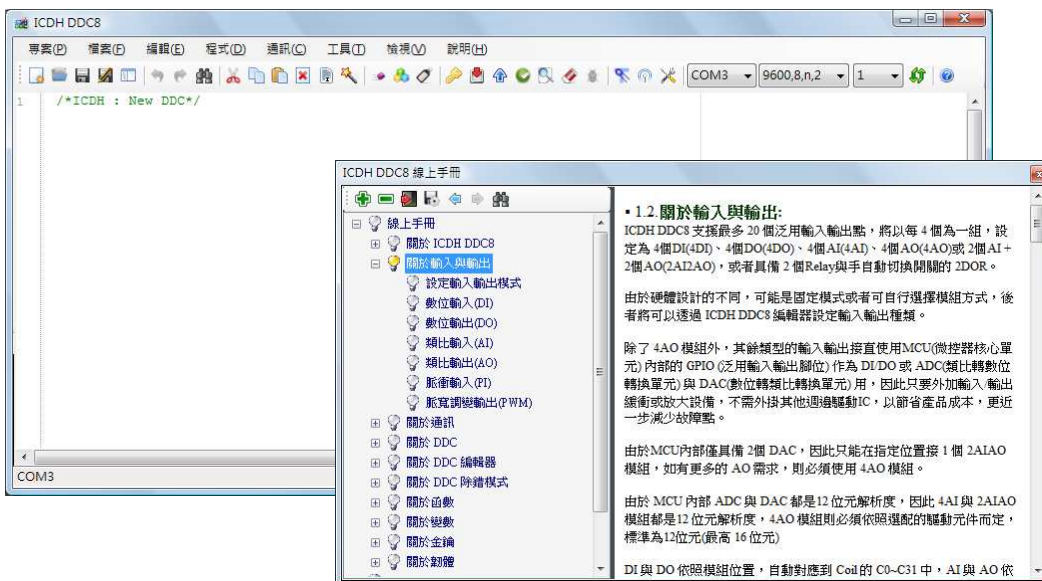- Dimensions : 25 x 106mm

Basic functions

▷ Support Modbus RTU communication control protocol

▷ Firmware online update function simplify firmware modification procedure.

Management Tool Functions

▷ Ethernet interface is applicable to standard Modbus-TCP communication protocol.

▷ RS-485 interface can be defined as communication port (Modbus-RTU)

▷ Complete online literatures, providing Chinese instructions to greatly reduce entry barrier

▷ Subprogram function provides program code management and application example explanation

▷ Real time input/output and register data access and setup

▷ For AI application, the user can self-define 10K NTC resistance reference table.

▷ RS-485 communication interface basic parameter setup (menu)

▷ Firmware update function allows online update for firmware at a designated address.

LLD-Modbus32E-01 Product Model Number

Function Carrier

▷ **LLD-Modbus32E-01☐-☐** LLD-Modbus32E expandable control Module MCU carrier

Blank – basic model

I – RS-485 interface with 2K Vrms isolation protection

T – Pluggable TB (mount in LLD-Case-02 if necessary)

Expansion Module

▷ **ModIO-AI**

   4-ch 12bit 4~20mA/0~10VDC simulation signal input (Analog Input) Module

▷ **ModIO-AO**

   4-ch 12bit 4~20mA/0~10VDC simulation signal output (Analog Output) Module

▷ **ModIO-AIO**

   2+2 12bit 4~20mA/0~10VDC simulation signal input/output (Analog Input / Analog Output) Module

▷ **ModIO-DI-S**

   4-ch 5~24 VDC isolation & surge protection digital input (Digital Input) Module

▷ **ModIO-DO-S**

   4-ch 5~30 VDC isolation & surge protection digital open collector output (Open Collector Output) Module

▷ **ModIO-Relay**

   2-ch 2A DC/AC Relay output (Relay) Module

▷ **ModIO-12DI**

   12-ch 5~24 VDC isolation protection digital input (Digital Input) Module

▷ **ModIO-12DO**

   12-ch 5~30 VDC isolation Protection digital open collector output (Open Collector Output) Module
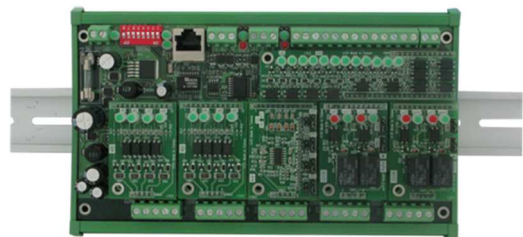
Accessory

▷ **LLD-DDC32E**

   LLD-Modbus32E-01 DDC SW License

▷ **LLD-CR-01**

   Din-Rail carrier used by LLD-Modbus32E-01

▷ **LLD-Case-02**

   Iron casing designated for LLD-Modbus32E-01 (no prints and tag)   Note: MoQ requirement

Figure

LLD-CR-01 (not include guide rail below)

I/O Module Installation
(MCU Carrier + I/O Module + Din-Rail Carrier Board)

LLD-Case-02