

## LLD-ModbusIO-01 Modbus I/O Expandable Control Module (Modbus-RTU)

v 1.42

- ✓ RS-485 remote equipment data transmission communication
- ✓ RS-485 isolation protection (optional)
- ✓ Standard Modbus-RTU communication protocol
- ✓ Expandable I/O module for various applications
- ✓ Provide Relay Output control
- ✓ Provide Open Collector Digital Output control
- ✓ Provide optically isolated digital input control interface (Isolated DI)
- ✓ Provide 12-bit Analog Input control Interface (AI)
- ✓ Provide 12-bit Analog Output control interface (AO)
- ✓ 24V DC/AC power supply mode
- ✓ Reserved expansion interface : RS-485, GPIO



### Production introduction

LLD-ModbusIO-01 is a DAM control module with flexibility and high performance-to-price ratio. It has Digital Input/Output and Analog Input/Output common control and acquisition interface for measurement data. The user, depending on application requirements, can select one to five expansion I/O modules (ModIO module series) of different function, providing 20 control points at most. The user can easily obtain the previously mentioned multifunctional combination for control interface; with specific carrier, the control module is commonly seen to be installed on standard guide rail in industrial environment.

LLD-ModbusIO-01 RS-485 communication interface provides the user with a standard Modbus-RTU communication control protocol, allowing easy remote control with various monitoring application programs.

#### ✘ Flexible I/O Interface

LLD-ModbusIO-01 provides 5+1 I/O module expansion function. With installation of different modules, the user can obtain different I/O combination, enabling more flexible control and data acquisition functions to meet different requirements.

5 main I/O modules can freely install Digital I/O, Analog I/O and Relay control modules, up to 20 control points.

1 expansion module presently can provide 12 extra Digital Input and Output control points. The interface, allowing to develop other functions in the future, provides LLD-ModbusIO-01 with complete control or communication capability.

#### ✘ Easy DDC Management and Program Development Environment

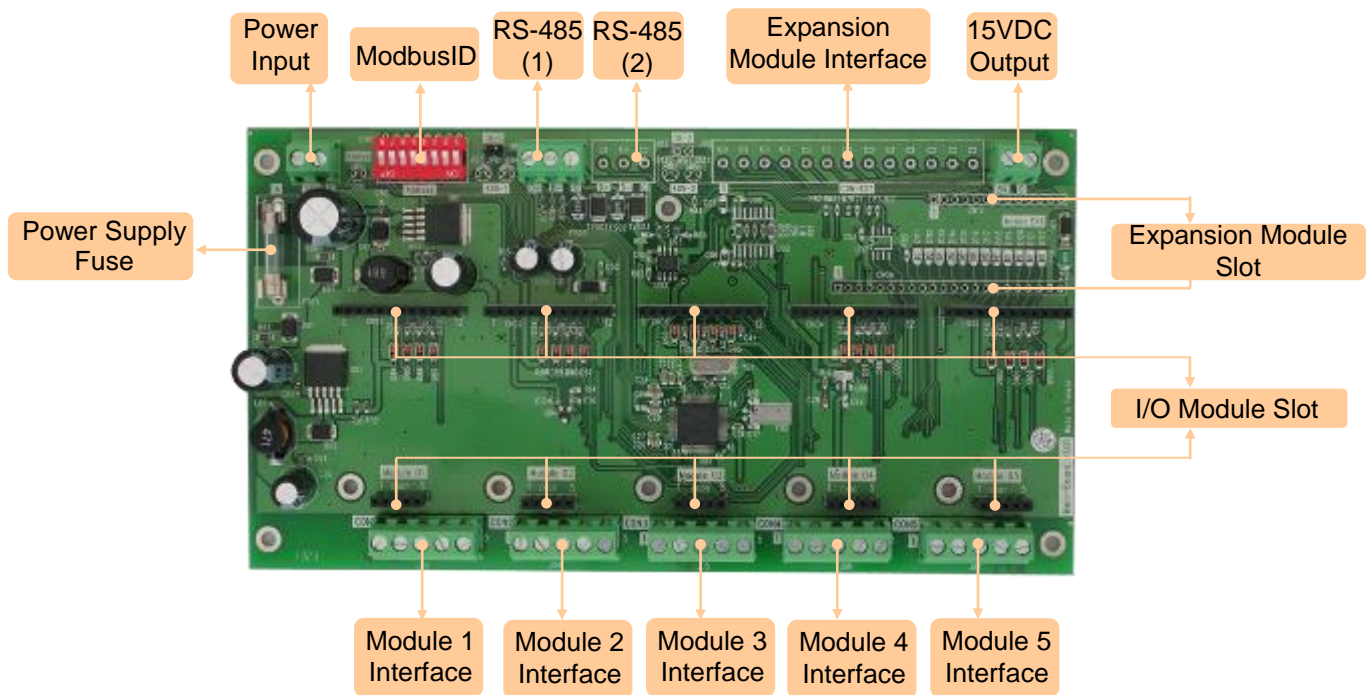
LLD-ModbusIO-01 has a simple management tool, window and menu design, easy for setting up LLD-ModbusIO-01. It also provides real time operating status monitoring function, allowing remote monitoring for operating status at each point.

#### ✘ Remote Upgrade Function

The user can monitor computer via the management tool specialized for LLD-ModbusIO-01 and conduct remote software upgrade via RS-485 communication port, which can reduce system operating cost.

## LLD-ModbusIO-01 MCU Board

### Exterior description



#### System Core

- ▶ MCU : ST STM8L15xR8
- ▶ Memory : 64KB FLASH, 4KB SRAM, 2KB EEPROM

#### RS-485 Serial Port Interface

- ▶ Quantity : 1 or 2
- ▶ RS-485 signal : Data+, Data-, GND
- ▶ Protection : 15KV ESD and 400W surge protection, 500VDC 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

#### IO Module Expansion Slot

- ▶ Quantity : 5
- ▶ connector A : 2.54mm 12-pin pin block
- ▶ connector B : 2.54mm 5-pin pin block
- ▶ connector C : 5.00mm 5-pin terminal block

#### Reserved Expansion Interface

- ▶ Quantity : 1
- ▶ Connector A : 2.54mm 22-pin pin block
- ▶ Connector B : 2.54mm 13 pin pin block
- ▶ Connector C : 5.00mm 13-pin terminal block

#### Mechanism

- ▶ Control board dimensions : 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 Supply

- ▶ Working voltage : 24V AC/DC
- ▶ Power connector : 2-pin 5.00mm terminal block
- ▶ Protection : 1A fuse
- ▶ Power consumption : 0.5~10W

#### Others

- ▶ LED indicator : power supply, serial port
- ▶ DIP Switch : MODBUS Slave address
- ▶ Applicable temperature : 0~50°C
- ▶ Applicable humidity : 20%~80% RHG
- ▶ Certification : CE/FCC

## Specified I/O Expansion Module

### Common Specifications

- ▶ Dimension : 35x50mm
- ▶ Fixation hole : 3.5mm x 1

### AI/AO Module (ModIO-AIO)

#### Analog Input / Output Control

- ▶ AI quantity : 2 points
- ▶ AO quantity : 2 points
- ▶ Signal type : 4~20mA / 0-10VDC / NTC (by jumper)
- ▶ Resolution : 12-bit
- ▶ Frequency : 10Hz
- ▶ Protection : OP input/output buffer
- ▶ Installation limit : 1 (only 1 ModIO-AIO is allowed on each MCU carrier)

- ▶ Pin header A : 2.54mm 12-pin x 1 (connect to carrier MCU)
- ▶ Pin header B : 2.54mm 5-pin x 1 (connect to carrier exterior connector)



### AI Module (ModIO-AI)

#### Analog Input Control

- ▶ Quantity : 4 points
- ▶ Signal type : 4~20mA / 0-10VDC / NTC (by jumper)
- ▶ Resolution : 12-bit
- ▶ Frequency : 10Hz
- ▶ Protection : OP input buffer



### AO Module (ModIO-AO)

#### Analog Output control

- ▶ Quantity : 4 points
- ▶ Signal type : 4~20mA or 0-10VDC (by jumper)
- ▶ Resolution : 12-bit
- ▶ Frequency : 10Hz
- ▶ Protection : OP output buffer



### DI Module (ModIO-DI)

#### Digital Input Control

- ▶ Quantity : 4 points
- ▶ Mode : wet contact / sink mode
- ▶ Input voltage range : 5~24VDC
- ▶ Input protection : 2000Vrms optically isolated protection
- ▶ LED indicator : DI status

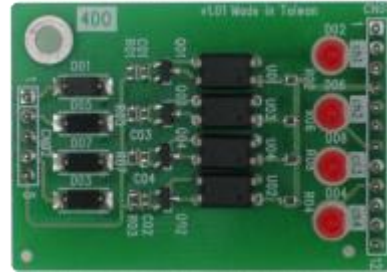




### DO Module A (ModIO-DO)

#### Digital Output Control

- ▶ Quantity : 4
- ▶ Signal type : Open Collector
- ▶ Load capacity : 5~30 VDC @ 200mA
- ▶ Signal protection : 2000Vrms optically isolated protection
- ▶ LED indicator : DO status



### DO Module B (ModIO-Relay)

#### Relay Output Control

- ▶ Quantity : 2
- ▶ Signal type : SPDT relay  
Ch-A : N.O. / COM  
Ch-B : N.O./ N.C. / COM
- ▶ Control mode : automatic (by S/W) and manual control
- ▶ Contact capacity : 240VAC@2A / 24VDC@2A
- ▶ Signal protection : 2000Vrms optically isolated protection
- ▶ LED indicator : DO status
- ▶ Manual/ automatic control and status monitoring (by jumper)



### Expansion DI Module (ModIO-12DI)

#### Digital Input Control (Isolated)

- ▶ Quantity : 12
- ▶ Mode : wet contact / sink mode
- ▶ Input voltage range : 5~24VDC
- ▶ Input protection : 2000Vrms optically isolated protection
- ▶ LED indicator : DI status
- ▶ Dimensions : 25 x 100mm



### Expansion DO module (ModIO-12DO)

#### Digital Output control (Isolated)

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



### Common Specifications for ModIO-12DI/12DO

- ▶ 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)

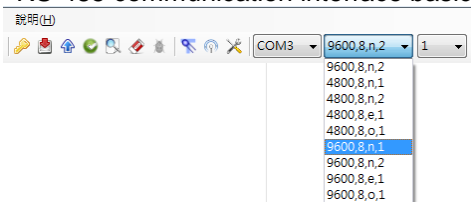
## LLD-ModbusIO-01 Software Specifications

### Basic functions

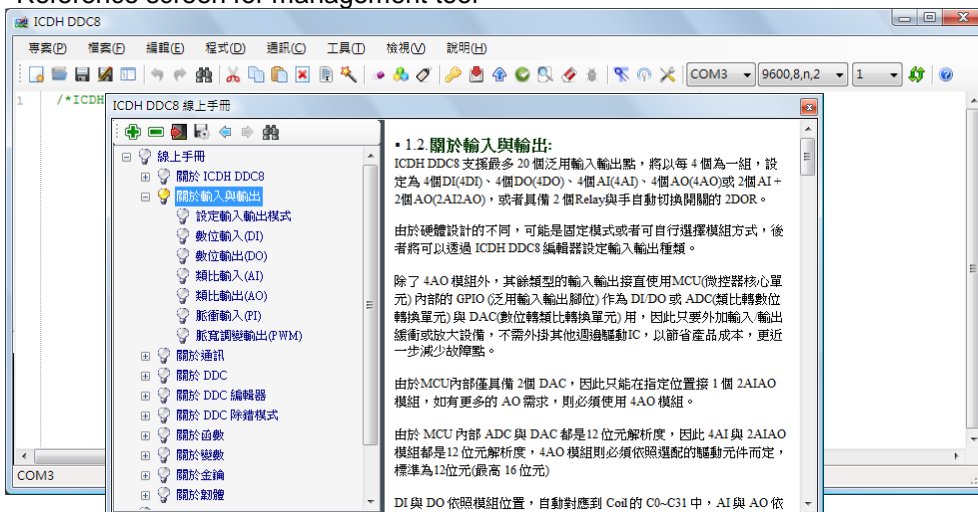
- ▶ Support Modbus RTU communication control protocol
- ▶ Firmware online update function to simplify firmware modification procedure.

### Management Tool Functions

- ▶ Set installed expansion module type
- ▶ Instant display for Analog Input expansion module input numerical data for each control point
- ▶ Instant make Analog Output expansion module output numerical data control for each point
- ▶ Instant display for Digital Input expansion module input status for each control point
- ▶ Instant make Digital Output expansion module control for each point
- ▶ RS-485 communication interface basic parameter setup (menu type)



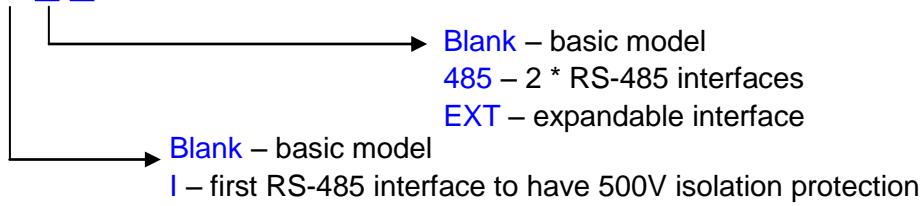
- ▶ Firmware update function allows online update for firmware at specified address.
- ▶ Reference screen for management tool



## LLD-ModbusIO-01 Product Model Number

### Function Carrier

▶ **LLD-ModbusIO-01** □ □



Modbus-RTU expandable control module MCU carrier

### Expandable module

- ▶ **ModIO-AI**  
4-ch 12bit 4~20mA/0~10VDC Analog Input module
- ▶ **ModIO-AO**  
4-ch 12bit 4~20mA/0~10VDC Analog Output module
- ▶ **ModIO-AIO**  
2+2 12bit 4~20mA/0~10VDC Analog Input / Analog Output module
- ▶ **ModIO-DI**  
4-ch 5~24VDC isolation protection Digital Input module
- ▶ **ModIO-DO**  
4-ch 5~30VDC isolation protection Open Collector Output module
- ▶ **ModIO-Relay**  
2-ch 2A DC/AC Relay Output module
- ▶ **ModIO-12DI**  
12-ch 5~24VDC isolation protection Digital Input module
- ▶ **ModIO-12DO**  
12-ch 5~30VDC isolation protection Open Collector Output module

### Accessories

- ▶ **LLD-CR-01**  
Din-Rail carrier used by LLD-ModbusIO-01
- ▶ **LLD-Case-01**  
Iron casing designated for LLD-ModbusIO-01 (no prints and tag) Note: MoQ required

### Figures

LLD-CR-01



LLD-Case-01



**I/O module installation**  
( MCU carrier + I/O module + Din-Rail carrier)

