

LLD-DDC8-01 Direct Digital expandable Control module (DDC)

Ver. 1.41

- ✓ Provide advanced DDC function
- ✓ 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
- ✓ RS-485 remote equipment data transmission communication
- ✓ RS-485 isolation protection (optional)
- ✓ Reserved expansion interface : RS-485, D I/O



Production introduction

LLD-DDC8-01 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-DDC8-01 has DDC (Direct Digital Control) field real time control function. It is a distributed control and programmable controller with features in few points, independent control, fast response and easy programming. The RS-485 communication interface for LLD-DDC8-01 provides the user with a standard Modbus-RTU communication control protocol, which can easily conduct remote control through various monitoring application programs.

✘ Flexible I/O Interface

LLD-DDC8-01 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-DDC8-01 with complete control or communication capability.

✘ DDC Program Password Protection

LLD-DDC8-01 allows the user to set an 8-digit password to protect the program, which is used during program upload, download and debug to protect the running DDC program in the field from being hacked.

✘ Easy DDC Management and Program Development Environment

LLD-DDC8-01 has a simple management tool, window and menu design, easy for setting up LLD-DDC8-01. It also provides real time operating status monitoring function, allowing remote monitoring for operating status at each point.

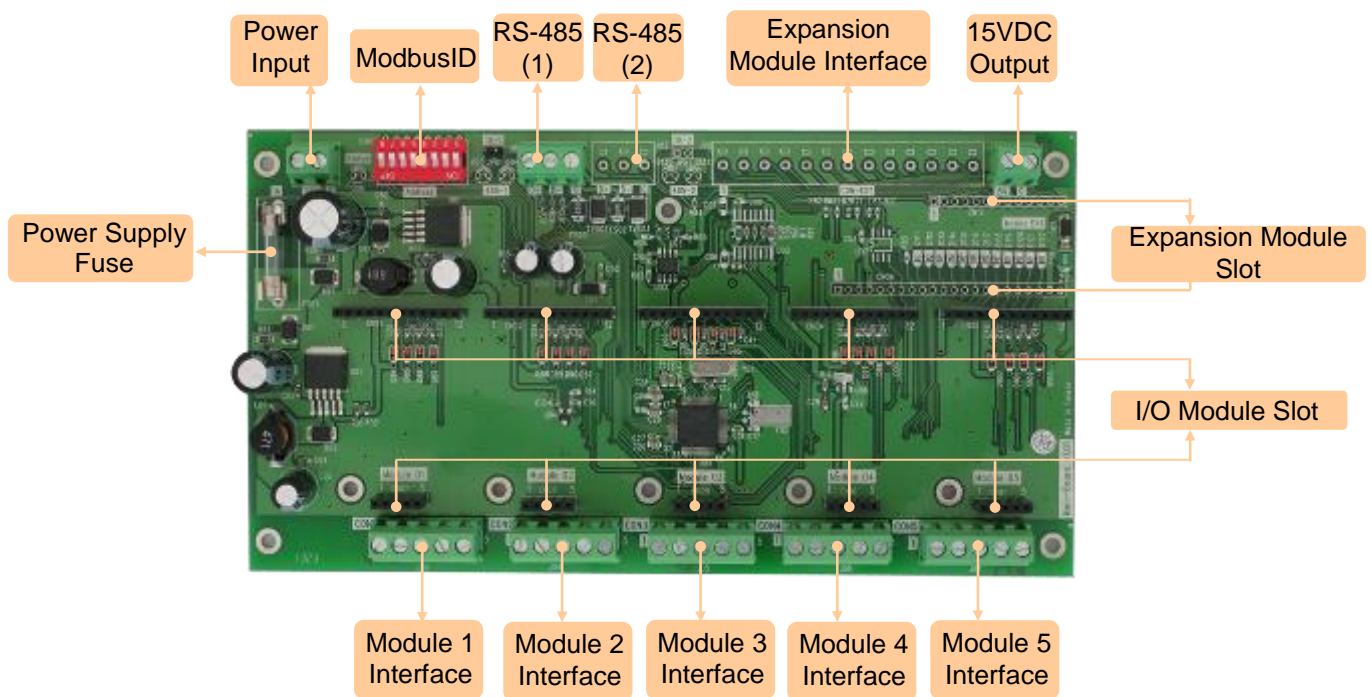
The management tool also provides DDC command compilation environment, online technical manual and debug mode, allowing the user to complete the required parameter setup and DDC control application program development procedures with the same management tool.

✘ Complete DDC Control Function

LLD-DDC8-01 DDC has input access, output control, mathematical operation, comparison, time, HVAC, PID...over 50 commonly used functions, allowing the user to directly develop DDC program from the management tool and upload and test the program.

LLD-DDC8-01 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

- ▶ 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/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)



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

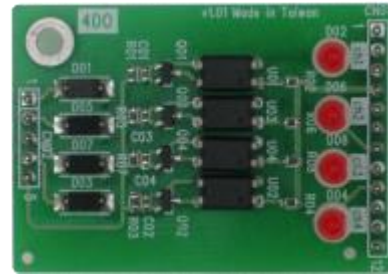
- ▶ Quantity : 4 points
- ▶ Mode : wet contact / sink mode
- ▶ Input voltage range : 5~24VDC
- ▶ Input protection : 2000Vrms optically isolated protection
- ▶ LED indicator : DI status



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



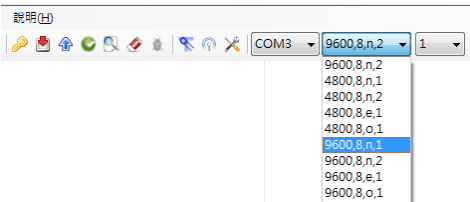
Common Specifications for ModIO-12DI/12DO

- ▶ 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-DDC8-01 Software Specifications

Management Tool Functions

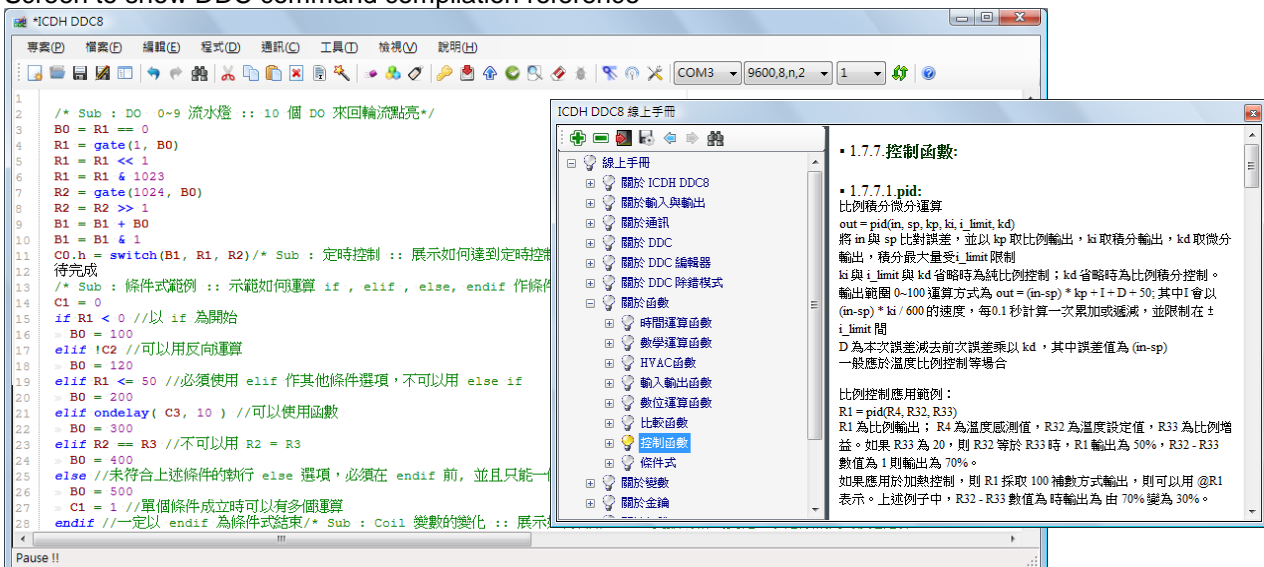
- ▶ Display equipment / DDC program operating status
- ▶ Edit, upload and read DDC program
- ▶ Online instant debug, pause and single step execution, facilitate the understanding of program operation and output results
- ▶ Automatically complete program code and prompt functions, simplify program input.
- ▶ Subprogram function provides program code management and application example explanation.
- ▶ Instant input/ output and register data access and setup
- ▶ In AI applications, self-define 10K NTC resistance value reference table.
- ▶ RS-485 communication interface basic parameter setup (menu type)



- ▶ Firmware update function allows online update for firmware at specified address.

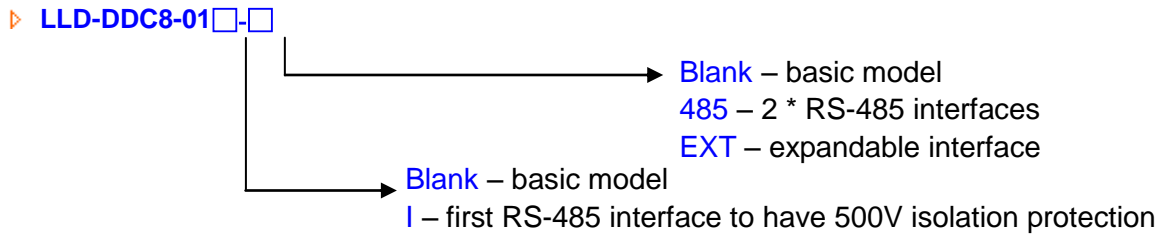
DDC Program Control

- ▶ DDC service and 1.5KB (1,536 Bytes) EEPROM DDC program space
- ▶ Online update for DDC control program at any time
- ▶ Over 50 high level functions and commands, computing with PID control conditions and various time computing, mathematical computing and logic computing functions, to easily achieve independent operation requirement and dissipate control risk.
- ▶ 32 Coils and 32 Registers to support memory function at power failure, save operating and setup values from power failure damage.
- ▶ All DI points work for pulse input, with max input frequency 100 Hz, broad product application range
- ▶ DDC program has password protection function to prevent access to the program and the intelligent property right
- ▶ Firmware online update function to simplify firmware modification procedure
- ▶ Screen to show DDC command compilation reference



LLD-DDC8-01 Product Model Number

Function Carrier



DDC 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-DDC8-01
- ▶ **LLD-Case-01**
Iron casing designated for LLD-DDC8-01 (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)

