Y301-0004/0006/0008 Serial I/O Modules (Analog Output) Specification

Y301-0004	Y301-0006	Y301-0008
		

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- User Manual and Wiring

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1. Overview

The Y301-0004/0006/0008 are analog output modules. They provide Modbus RTU/ASCII control of `0–10 V` and/or `4–20 mA` channels for PLCs, SCADA systems, building automation, and lab platforms.

Model	Analog Output	Interface Options	Typical Role
Y301-0004	4 AO	RS485 / RS232	Small HVAC and OEM retrofits
Y301-0006	6 AO	RS485 / RS232	Mid-size process skids
Y301-0008	8 AO	RS485 / RS232	High-density analog drive

Product Highlights

- 14-bit DAC with register setpoint increments of 1 mV or 1 µA
- Configurable `0–10 V` and `4–20 mA` outputs, with jumper-selectable combo versions
- Opto-isolated RS485 plus optional RS232
- Configurable output retention; verify the startup behavior for the ordered firmware

2. Ordering Information

2.1 Model Configuration

The I/O code follows `DI / DO / AI / AO`. These are channel counts on one module; the fourth position is omitted on models without AO.

Model	DI	DO	AI	AO
Y301-0004	0	0	0	4
Y301-0006	0	0	0	6
Y301-0008	0	0	0	8

Interface type and output signal mode are configuration options. They are not appended to the product model number.

For the full code and examples, see Model Naming.

2.2 Configuration Matrix

Model	Interface Options	Output Mode Options	Description
Y301-0004	RS485 / RS232	0-10 V / 4-20 mA / combo	4-channel analog output module
Y301-0006	RS485 / RS232	0-10 V / 4-20 mA / combo	6-channel analog output module
Y301-0008	RS485 / RS232	0-10 V / 4-20 mA / combo	8-channel analog output module

> Combo SKUs use internal jumpers to switch each channel between voltage and current output.

2.3 Standard Package

Module, quick reference guide, and warranty card. Optional accessories include a DIN-rail 24 V power supply, USB-to-RS485 converter, and shielded harness kit.

3. Key Features

1. **Analog conversion** - 14-bit DAC; register increments are separate from physical output resolution

2. **Signal outputs** - `0–10 V` or `4–20 mA` outputs for compatible receivers
3. **Serial protocols** - Modbus RTU/ASCII; a separate gateway is required for Modbus TCP
4. **Power and isolation** - 12-30 VDC supply and opto-isolated RS485
5. **Power-loss memory** - Optional retention restores the last analog output after reboot
6. **JYDAM toolchain** - Configuration tool for channel setpoints and communication checks

4. Technical Specifications

4.1 Electrical and Environmental

Parameter	Specification
Supply voltage	12-30 VDC
Typical power consumption	11 mA @ 24 V (~0.26 W)
Isolation	Opto-isolated RS485
Operating temperature	-40 to +85 °C
Humidity	0-95% RH, non-condensing
Dimensions	100 × 70 × 35 mm

4.2 Analog Output Specifications

Parameter	Specification
Channel count	4, 6, or 8 depending on model
Output type	0-10 V or 4-20 mA by ordered version; combo versions use jumpers
Resolution	14-bit (16384 steps)
Accuracy	Platform reference: ±0.03% FS at 25 °C; verify for the ordered hardware

Parameter	Specification
Linearity	Not specified for the ordered hardware
Settling time	Not specified for the ordered hardware
Output impedance	Not specified for the ordered hardware
Load capability	Not specified for the ordered hardware

4.3 Communication Specifications

Parameter	Specification
Interface	Opto-isolated RS485, optional RS232
Protocol	Modbus RTU, Modbus ASCII; Modbus TCP requires an external gateway
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps; default 9600
Address setting	1-255; setup address 254 is reserved for a single-device connection
Default address / serial format	1 / 9600 bps, 8 data bits, no parity, 1 stop bit
Isolation voltage	Not specified for the ordered hardware

5. Interfaces and Pinout

5.1 Terminal Layout

Terminal	Description
Power	`VCC`, `GND` (12-30 VDC)
RS485	`TX/A+`, `RX/B−` on the RS485 version (opto-isolated)

Terminal	Description
RS232	`TX/A+`, `RX/B−`, `GND` on the RS232 version
AO output	`AO1–AOn` signal positive; `AGND` common signal negative
Configuration	Voltage/current jumpers on combo versions only

5.2 LED Indicators

LED	Status	Description
Power	On	Supply present; use the hardware-specific indicator definitions
Communication / fault indicators	Hardware-dependent	Use the ordered model's indicator definitions

6. Wiring Guidelines

6.1 Power Connection

- Use 18-22 AWG wiring for the 12-30 VDC supply
- Add a 1 A fuse for overcurrent protection
- Verify correct polarity before power-on

6.2 Output Connection

Voltage mode (0-10 V):

- Wire the receiver signal positive to the selected AO terminal and its negative to `AGND`
- Obtain the voltage output load limits for the ordered hardware before selecting the receiver

Current mode (4-20 mA):

- Wire the current receiver to the selected AO terminal and `AGND`

- Obtain the output compliance voltage and permitted loop resistance before selecting the load

6.3 Communication Connection

RS485:

- Use shielded twisted pair
- Add 120 ohm termination resistors at both ends of the bus
- Connect `A` to `A`, `B` to `B`, and `GND` to `GND` across all devices

RS232:

- Use the pinout for the ordered RS232 version
- Choose cable length for baud rate, cable capacitance, and electrical environment

7. Communication and Configuration

7.1 Modbus Register Map

AO setpoints use unsigned 16-bit holding registers: read with `0x03`, write one channel with `0x06`, or write several with `0x10`. Protocol addresses are zero-based.

Channels	Protocol addresses	PLC notation	Supported models
AO1-AO4	`0x0000–0x0003`	40001-40004	Y301-0004/0006/0008
AO5-AO6	`0x0004–0x0005`	40005-40006	Y301-0006/0008
AO7-AO8	`0x0006–0x0007`	40007-40008	Y301-0008

```text
voltage setpoint (V) = raw / 1000       // raw 0–10000 for 0–10 V
current setpoint (mA) = raw / 1000      // raw 4000–20000 for 4–20 mA
```

A 12 mA setpoint is `12000` (`0x2EE0`); it is not a normalized 0-10000 value. Readback gives the setpoint; verify the physical output with a meter. Write only fitted channels and values within the ordered range.

7.2 Configuration Parameters

Parameter	Protocol address	PLC notation	Description
Serial configuration	`0x03E8`	41001	Baud-rate code in bits 0-7; parity in bits 8-9; stop bits in bits 10-11
Reserved / version-dependent	`0x03E9`	41002	The platform documentation conflicts; do not write without the firmware-specific map
Address offset	`0x03EA`	41003	Configured device address

The documented baud codes are `0/3=9600`, `1=2400`, `2=4800`, `4=19200`, `5=38400`, `6=115200`, `7=57600`, and `10=1200`. Codes 8 and 9 appear in the register table but their speeds are absent from the main specification; check firmware support before using them.

Parity codes are `0=none`, `1=even`, `2=odd`; stop-bit codes are `0=1`, `1=2`, `2=1.5`. Preserve the other fields when changing one setting. Restart after changing the address or serial settings, then reconnect using the new settings.

Physical voltage/current selection uses jumpers on combo hardware. The platform does not document an output-mode register at `40303`.

8. Diagnostics and FAQ

8.1 Troubleshooting

Symptom	Possible Cause	Solution
No output response	Power fault	Check supply wiring and input voltage
Communication failure	Baud-rate mismatch	Check the configured address, baud rate, parity, and stop bits

Symptom	Possible Cause	Solution
Poor output accuracy	Incorrect load impedance	Verify load impedance requirements

8.2 FAQ

Q: How do I change the output mode? A: Combo versions use internal jumpers. Follow the ordered hardware's jumper drawing; fixed-range versions retain their ordered signal mode.

Q: Which communication protocols are supported? A: Modbus RTU, Modbus ASCII, and Modbus TCP through a gateway are supported.

Q: How does power-loss memory work? A: Retention is configurable. Verify its enable setting and startup output for the supplied firmware before relying on it after a power cycle.

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