Y401-0044-L LoRa Wireless Analog I/O Synchronization Module Specification



- User Manual

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1. Overview

The Y401-0044-L is a four-channel point-to-point wireless analog I/O synchronization module using LoRa communication. Each module provides four analog inputs and four analog outputs. Order the module with either a 4-20 mA current signal configuration or a 0-10 V voltage signal configuration.

A link uses two modules. Analog inputs at one module are transmitted wirelessly to the corresponding outputs at the other module. On the 4-20 mA version, the four channels operate independently over a half-duplex link. The pair is matched at the factory and needs no on-site configuration for normal operation. The signal configuration, accuracy, and loading limits must match the ordered version.

Signal Mapping

Channel	Device A to Device B	Device B to Device A
1	AI1 → AO1	AI1 → AO1
2	AI2 → AO2	AI2 → AO2
3	AI3 → AO3	AI3 → AO3
4	AI4 → AO4	AI4 → AO4

Use matching signal types at the source, module input, remote output, and receiving instrument. Select one signal configuration for the module pair and use matching field instruments.

2. Ordering Information

Model Configuration

`Y401-0044-L` is a one-to-one LoRa analog pair. The first two digits, `00`, indicate no digital I/O on either side; the final two digits, `44`, indicate 4 AI and 4 AO on each device.

For the full code and examples, see Model Naming.

Signal Options

Signal type	Nominal range
Current	4-20 mA
Voltage	0-10 V

Specify the required signal type when ordering. The faceplate has separate marks for the two ranges. Use the supplied signal configuration and do not connect a different signal type.

3. Key Features

- Four matching analog signal paths in each direction
- Current or voltage configuration selected when ordering
- Active constant-current outputs on the 4–20 mA version
- Individual channel indicators and labeled output/return terminal pairs

4. Technical Specifications

Parameter	Specification
Model	Y401-0044-L
Wireless technology	LoRa
Network topology	Point-to-point
Communication mode, 4-20 mA version	Half-duplex
Frequency band, 4-20 mA version	398 to 525 MHz

Parameter	Specification
Antenna, 4-20 mA version	SMA connector; 470 MHz magnetic-mount antenna
Communication range	Up to 5 km standard; 10 km option available for selected configurations
Analog inputs	4
Analog outputs	4
Analog signal options	4-20 mA or 0-10 V
Digital I/O	None
Input terminals	AI1+, AI2+, AI3+, AI4+, GND, GND
Output terminals	AO1+/GND, AO2+/GND, AO3+/GND, AO4+/GND
Field terminals	5.08 mm pitch pluggable terminals
Indicators	Work, Link, AI1-AI4, AO1-AO4

Signal-Version Electrical Specifications

Parameter	4-20 mA version	0-10 V version
Supply voltage	9-36 V DC	9-36 V DC
Max. power consumption	Approx. 2 W	1.5 W
Analog input	4 x active 4-20 mA current inputs	4 × 0-10 V voltage inputs
Input accuracy	≤ ±0.3 mA acquisition accuracy	≤ ±0.1 V acquisition accuracy
Input source or limit	Active signal; current-source voltage ≥10 V; Imax ≤24 mA	Maximum input voltage Vmax ≤10 V
Analog output	4 x active 4-20 mA constant-current outputs	4 × 0-10 V voltage outputs

Parameter	4-20 mA version	0-10 V version
Output accuracy or error	≤ ±0.3 mA output error; load ≤500 ohms	≤ ±0.1 V output accuracy
Operating temperature	-20 to +75 °C	-20 to +75 °C

Both versions use 9-36 V DC power. Do not apply current-version signal or load limits to a voltage-configured module.

5. Interfaces and Indicators

Terminal Layout

The following order follows the faceplate viewed from the front, left to right. The positions below identify locations in each row, not printed terminal numbers.

Row position	Upper row	Lower row
1	−: DC supply negative	AO1+: channel 1 output
2	+: DC supply positive	GND: output return
3	AI1+: channel 1 input	AO2+: channel 2 output
4	AI2+: channel 2 input	GND: output return
5	AI3+: channel 3 input	AO3+: channel 3 output
6	AI4+: channel 4 input	GND: output return
7	GND: input return	AO4+: channel 4 output
8	GND: input return	GND: output return

Connect each output circuit to its labeled AO terminal and adjacent GND. The GND markings do not establish galvanic isolation between channels or between signal and power circuits.

Indicators

The following status descriptions apply to the 4-20 mA version.

Label	Function	Status
Work	Module operation	On after startup
Link	Wireless link	On when the paired module is connected; off when disconnected; flashing indicates abnormal communication
AI1-AI4	Corresponding analog input channel	On when input current is detected; off when no current is detected
AO1-AO4	Corresponding analog output channel	On while output current is produced; off when no current is produced

6. Mechanical and Environmental

Mechanical Specifications — 4-20 mA Version

Parameter	Specification
Overall dimensions, W × H × D	54 × 112 × 59 mm, as shown in the enclosure drawing
Weight	Approx. 350 g
Mounting	35 mm DIN rail

Use the supplied enclosure drawing for the 0-10 V version and for mounting clearances.

Environmental Specifications — 4-20 mA Version

Parameter	Specification
Operating temperature	-20 to +75 °C
Operating humidity	10% to 90% RH, non-condensing

7. Installation and Wiring

Use the user manual for 4–20 mA input wiring, two-wire AO connections, 0–10 V wiring, and commissioning.

The four inputs share the input GND terminals. Each output uses its labeled AO+ and adjacent GND. Module and field-instrument power connections are separate from the signal pairs.

8. Important Notes

- Range figures assume an open-area installation. The 10 km option requires the specified configuration and antenna; obstructions, interference, and antenna placement affect the installed link.
- Use the ordered current or voltage configuration throughout the signal path. Do not apply a voltage signal to a current-configured input.
- Current-version load limits do not define voltage-output drive limits. Check the voltage output's minimum load resistance against the receiver input impedance before connection.
- The 4–20 mA version uses half-duplex communication with variable delay. Assess timing and output behavior during link loss and recovery before connecting a control load.
- Do not use the wireless link as the sole emergency-stop or personnel-safety path.

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