Y401-0011-L LoRa Wireless Analog I/O Synchronization Module Specification



- User Manual

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1. Overview

The Y401-0011-L is a single-channel point-to-point wireless analog I/O terminal based on LoRa modulation. A standard system uses two factory-paired modules, Device A and Device B. Each module provides one 4-20 mA analog input and one 4-20 mA analog output.

Each analog input at one device is transmitted over the wireless link and reproduced as the corresponding 4-20 mA analog output at the other device. The same signal paths can operate in the reverse direction. The wireless link is half-duplex.

Signal Mapping

Direction	Signal path
Device A to Device B	Device A `AI1` → wireless link → Device B `AO1`
Device B to Device A	Device B `AI1` → wireless link → Device A `AO1`

Input Acquisition and Output Updates

The module samples the AI current continuously on a millisecond timescale. It transmits when the detected current change exceeds 0.1 mA. When the input current remains unchanged, it does not periodically transmit analog data, so AO updates do not have a fixed frequency in Hz.

After receiving the data, the paired module reproduces the corresponding 4–20 mA output. End-to-end response includes wireless transmission and processing; response and output settling times depend on transmission distance and environmental conditions. Millisecond-scale acquisition does not specify the end-to-end response or output settling time.

2. Ordering Information

Model Configuration

`Y401-0011-L` is a one-to-one LoRa analog pair with no digital I/O. Each device provides one AI channel and one AO channel.

For the full code and examples, see Model Naming.

Channel Configuration

Digital input	Digital output	Analog input	Analog output
0	0	1	1

System Configuration

A standard Y401-0011-L wireless link uses two factory-paired modules: Device A and Device B. No on-site configuration is required for normal operation after the modules are connected to power and wired to the field circuits.

3. Key Features

- Bidirectional point-to-point transfer between factory-paired modules
- Active current input and output interfaces
- Reverse-polarity protection and hardware watchdog

4. Technical Specifications

Wireless

Parameter	Specification
Modulation	LoRa
Frequency band	398 to 525 MHz
Communication range	Up to 5 km standard in open, unobstructed conditions; 10 km option available for selected configurations; actual range depends on antenna installation, obstructions, interference, and site conditions
Antenna connector	SMA
Antenna option	470 MHz magnetic-mount antenna
Communication mode	Half-duplex

Electrical

Parameter	Specification
Supply voltage	9 to 36V DC
Max. power consumption	Approx. 2W
Analog input	1 × 4-20 mA active current input
Input source requirement	Active current source with a source voltage of at least 10V

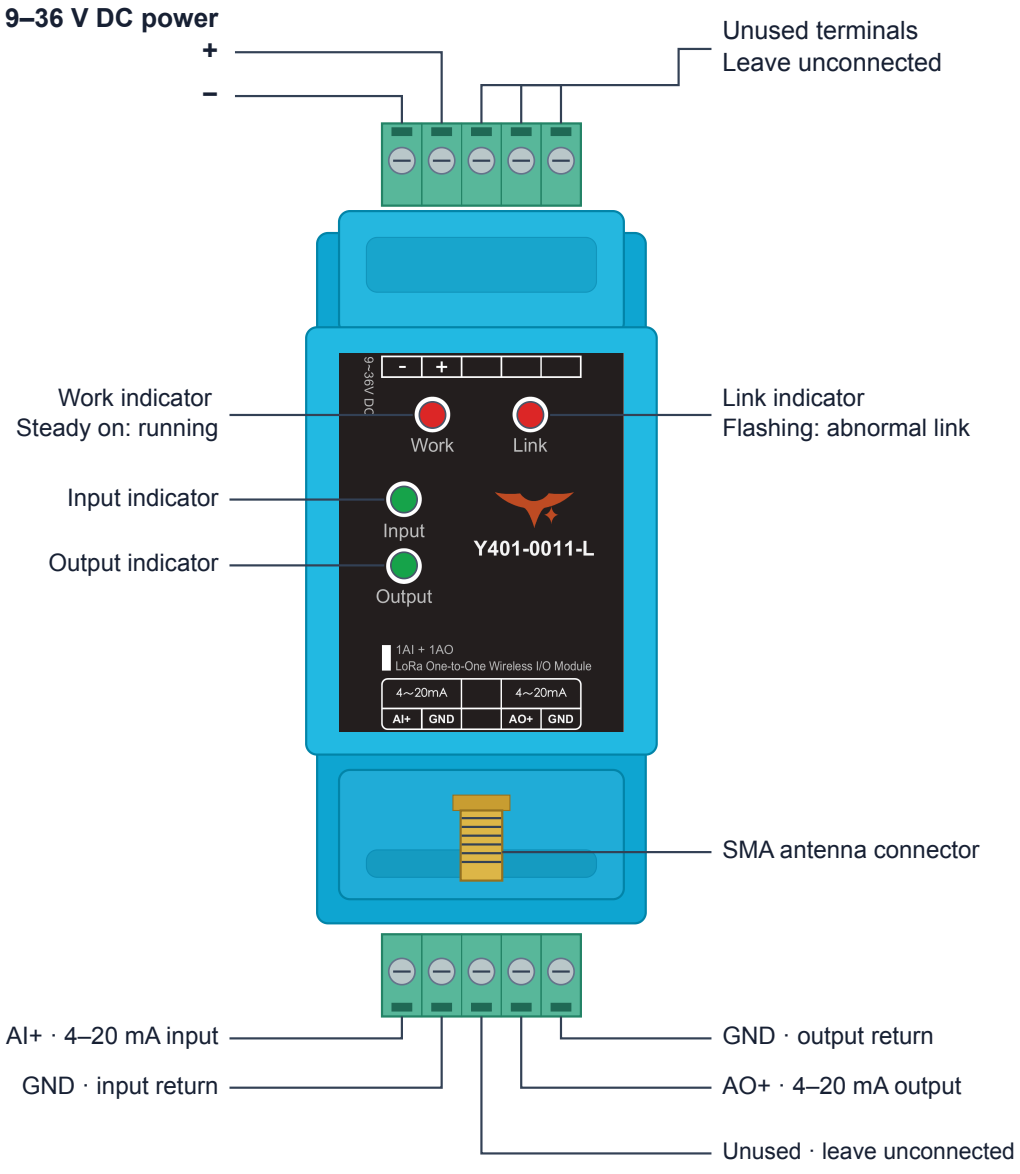
Parameter	Specification
Input current limit	Imax ≤ 24 mA
Input acquisition accuracy	≤ ±0.3 mA
Analog output	1 × 4-20 mA active constant-current output
Output error	≤ ±0.3 mA
Maximum stated load	≤ 500 ohms; verify the supply-voltage and load combination before use

Interfaces

Parameter	Specification
Field terminals	5.08 mm pitch pluggable terminals
Installation	35 mm DIN rail

5. Interfaces and Indicators

Terminal Layout



Viewed from the front, terminal positions run from left to right. The row positions below identify physical locations, not printed terminal numbers.

Row Position	Upper Row	Lower Row
1	Power −: DC supply negative	AI+: analog input positive
2	Power +: DC supply positive	GND: input return
3	Unused; leave unconnected	Unused; leave unconnected

Row Position	Upper Row	Lower Row
4	Unused; leave unconnected	AO+: analog output positive
5	Unused; leave unconnected	GND: output return

Connect the 9 to 36V DC supply to the upper-row + and – terminals. AI+/GND accepts the 4-20 mA input signal; AO+/GND provides the active 4-20 mA output. The SMA antenna connector sits above the lower terminal row. Use the actual terminal markings when wiring.

The wiring diagrams mark the negative sides of the analog input and output as ground. Do not assume galvanic isolation between the power, input, and output circuits without a confirmed electrical diagram.

LED Indicators

LED	Function	Status
Work	System operating status	On after the system starts
Link	Wireless link status	On when the paired device is connected; flashing indicates abnormal communication; off when disconnected
Input	Analog input status	On when an input current signal is detected
Output	Analog output status	On when the module is producing an output current

6. Mechanical and Environmental

Mechanical Specifications

Parameter	Specification
Dimensions	58.7 × 111.2 × 36.5 mm
Weight	Approx. 350 g
Mounting	35 mm DIN rail

Environmental Specifications

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

7. Installation and Wiring

See the user manual for two-, three-, and four-wire transmitter connections, two-wire AO connections, and commissioning.

Use active 4–20 mA input signals and compatible passive current receivers. Power two-wire transmitters from an external loop supply; module power connects separately from AI/AO signals.

8. Important Notes

- The half-duplex wireless link has variable delay and is unsuitable for guaranteed timing or as the sole emergency-stop/personnel-safety path.
- Input acquisition accuracy and output error are separate product limits. Include instrument errors when assessing the complete measurement path.

- Output loading depends on supply headroom as well as resistance. At 20 mA, a 500 ohm load alone needs 10 V; the 9 V minimum supply does not establish operation at maximum load.
- Validate output behavior during link loss and recovery before connecting a control load. Provide independent protection for the controlled process.

- **Manufacturer**: Hunan YenGear Tech Co., Ltd.
- **Address**: Room 21014, Building 1, Fudi Xingguang Tiandi, Yingxin Road, Yuhua District, Changsha, Hunan, China
- **Email**: hi@yengear.com
- **Website**: www.yengear.com