Y212-G 4G Serial Gateway Specification



> Reference: Y212-G / Y212-GWR Technical ManualCountry Coverage: Country Coverage Quick Guide

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1. Overview

Y212-G is an industrial serial-to-4G gateway designed to bring RS232 and RS485 devices online quickly. With a built-in Qualcomm Cat.4 LTE module, 2G / 3G fallback, SIM slot, and SMA antenna interface, it enables plug-and-play data collection, transparent transmission, remote configuration, OTA upgrade, and alarm reporting without changing legacy field wiring.

Item	Description
Product Type	Industrial 4G serial gateway
Cellular Uplink	Qualcomm Cat.4 multi-mode 4G with 2G / 3G fallback
Serial Interface	RS232 + RS485
Local I/O	`2 x` GPIO plus `1 x 0 to 8 V` analog input
Power Input	`6 to 28 VDC`, typical `12 V / 2 A`

Highlights

- Multi-band 4G coverage for domestic full-network use and many overseas deployments
- RS232 and RS485 in one device for easier field integration
- Built-in GPIO and analog input for simple local signal collection
- OTA, logs, and remote diagnostics reduce on-site maintenance
- Compact design supports both panel and DIN-rail installation

2. Ordering Information

2.1 Model Naming

```text
Y212 – G
  |     \– G: 4G / 5G cellular communication family, including LTE
```

```
Cat.4 and Cat.1 variants
  \------- Y212: Y2 series serial data collection terminal
```

2.2 SKU and Configuration

SKU	Description	Network Bands	Power Range
Y212-G	Qualcomm Cat.4 serial gateway, RS232 + RS485, `2 x IO`, `1 x AD`, remote maintenance support	7 modes / 15 bands: GSM EGSM900/DCS1800; WCDMA B1/B8; CDMA2000 BC0; TD-SCDMA B34/B39; LTE-FDD B1/B3/B5/B8; LTE-TDD B34/B38/B39/B40/B41	`6 to 28 VDC`

2.3 Package Contents

- Y212-G main unit x1
- 4G omnidirectional antenna, SMA x1
- SIM eject pin x1
- DIN-rail clip, optional x1
- Quick-start card and warranty card

2.4 Optional Accessories

- USB-to-RS485 debug cable
- `12/24 VDC` industrial power adapter
- Lightning protection kit and shielded twisted pair cable

2.5 Country Support Quick Guide (Current Cat.4 Version)

This model supports the following cellular bands:

- GSM: EGSM900 / DCS1800
- WCDMA: B1 / B8
- CDMA2000/EVDO: BC0

- TD-SCDMA: B34 / B39
- LTE-FDD: B1 / B3 / B5 / B8
- LTE-TDD: B34 / B38 / B39 / B40 / B41

Use the table below to check hardware support for your deployment country:

Country or Region	Decision	Typical Band Match Summary
China Mainland	**Supported**	Strong overlap with LTE FDD `B1/B3/B5/B8` and LTE TDD `B34/B38/B39/B40/B41`
India	**Supported**	Common LTE bands `B1/B3/B5/B8/B40/B41` have strong overlap
Thailand, Vietnam, Indonesia, Malaysia, Philippines, Singapore	**Supported in most areas**	Main LTE deployments often include `B1/B3/B5/B8`; check carrier by site
Japan, South Korea	**Partially Supported**	Partial overlap (mainly `B1/B3/B5`), but some operator primary bands are outside this model
EU and UK (Germany, France, UK, Italy, Spain, Netherlands, Poland)	**Partially Supported**	Overlap on `B1/B3/B8`; missing common low bands such as `B20/B28` in many networks
Australia, New Zealand	**Partially Supported**	Overlap exists, but missing `B28` can reduce rural or indoor coverage
United States, Canada	**Not Recommended**	Key local LTE bands used by major operators are not sufficiently covered

> **Important:** This is a band-overlap reference, not a carrier guarantee. Actual availability depends on local operator network planning, IoT SIM profile, APN, and certification requirements. **Fallback note:** 2G/3G fallback works only where local 2G/3G service is still active.

3. Key Features

1. **Multi-Mode 4G Cat.4**: Qualcomm Cat.4 cellular uplink with 2G / 3G fallback supports domestic full-network use and many overseas deployments.
2. **RS232 + RS485 in One Box**: Connect common serial devices without adding external converters.
3. **Cloud-Ready Protocols**: Supports TCP, UDP, HTTP, HTTPS, MQTT, MQTTS, and WebSocket.
4. **Remote OTA and Diagnostics**: Configure, upgrade, and troubleshoot devices without site visits.
5. **Built-In I/O and Analog Input**: `2 x` GPIO plus `1 x 0 to 8 V` input support local status collection.
6. **Industrial Input Protection**: `6 to 28 VDC` input with surge and reverse-polarity protection.
7. **Flexible Online Modes**: Always-online, wake-up, on-demand, and scheduled modes fit different response and power needs.
8. **Compact Industrial Installation**: Panel or `35 mm` DIN-rail mounting speeds up cabinet deployment.

4. Technical Specifications

4.1 Wireless and Network

Parameter	Specification
Cellular Module	Qualcomm Cat.4 module with 2G / 3G fallback and multiple hardware watchdogs
Radio Modes	7 modes / 15 bands: GSM EGSM900/DCS1800; WCDMA B1/B8; CDMA2000 BC0; TD-SCDMA B34/B39; LTE-FDD B1/B3/B5/B8; LTE-TDD B34/B38/B39/B40/B41
Protocol Stack	TCP, UDP, HTTP, HTTPS, MQTT, MQTTS, WebSocket

Parameter	Specification
SIM	Drawer-style `1.8 V / 3 V` SIM or USIM, full-size card
Antenna Interface	`50 ohm` SMA female, supports 4G and GNSS coexistence antennas
GNSS Positioning	Optional BeiDou plus GPS module with serial and server-side output

4.2 Communication Interfaces

Parameter	Specification
Main Serial Port	RS232 + RS485, shared terminal, `1200 to 921600 bps`, default `9600-8-N-1`
Secondary UART	TTL `3.3 V / 5 V`, available on the current Qualcomm-based Y212-G hardware
GPIO	`2 x`, configurable as input or output, `3.3 V` or `1.8 V` logic
Analog Input	`1 x 0 to 8 V`, default input impedance `>100 kohm`
USB	Available through a debug cable for PC configuration, optional accessory

4.3 Electrical and Power Consumption

Parameter	Specification
Supply Voltage	`6 to 28 VDC`
Recommended Power	Power adapter rated `>=2 A`
Typical Consumption	Online idle `20 to 40 mA @ 12 V`; data transmission `60 to 100 mA @ 12 V`; GNSS adds about `30 to 40 mA`

Parameter	Specification
Protection	Reverse-polarity protection, over-voltage protection, surge protection, hardware and software watchdog

4.4 Input and Output Capability

Parameter	Specification
IO1 / IO2	Configurable through GPI / GPO commands, input or output mode selectable
AD Range	`0 to 8 V`; for best linearity, `0 to 6 V` is recommended
Sampling Mode	Periodic sampling or command-triggered sampling, with data forwarded to the server

4.5 Environmental

Parameter	Specification
Operating Temperature	`-40 to 85 C`
Storage Temperature	`-45 to 90 C`
Relative Humidity	`5 to 95% RH`, non-condensing
Altitude	`<= 2000 m`
Reliability	`MTBF > 200,000 h`, typical

5. Interfaces and Pin Definitions

5.1 Terminal Definition

Pin	Signal	Description
1	IO1	Configurable digital input or output, high level `3.3 V` or `1.8 V`

Pin	Signal	Description
2	232-RX	Connect to external device TX, RS232 input
3	232-TX	Connect to external device RX, RS232 output
4	485B-	RS485 differential B-
5	485A+	RS485 differential A+
6	AD	`0 to 8 V` analog input
7	R2-TTL	Secondary UART RX2 on Qualcomm version
8	T2-TTL	Secondary UART TX2 on Qualcomm version
9	IO2	Configurable digital input or output
10	GND	System ground
11	GND	System ground, paralleled with pin 10
12	Vin+	DC positive input, `6 to 28 V`

5.2 Interface Summary

Interface	Description
Power Terminal	`3.5 mm` pluggable 12-pin terminal, recommended `14 to 24 AWG` wire, external `2 A` fast fuse suggested
SIM Slot	Drawer-style full-size SIM, push-to-eject with lock support
Antenna Port	SMA female, use 4G omnidirectional or directional antenna with good grounding
LEDs	Net, Server, and Data/GPS indicators show network and data status
Reset Button	Press `3 to 5 s` for soft reset; press `>10 s` to restore factory parameters

5.3 LED Status

LED	Status	Description
Net	Off	Network not registered
Net	`64 ms` on / `3 s` off	Registration failed, retrying
Net	`64 ms` on / `1 s` off	Network registered, waiting for server
Net	`64 ms` on / `300 ms` off	Network link established
Server	Off	Not connected to center server
Server	On	Connected to center server
Data/GPS	Off	No data activity or GNSS disabled
Data/GPS	Blinking	Data TX/RX active or GNSS searching satellites
Data/GPS	On	GNSS fix acquired on positioning version

6. Mechanical and Environmental

Item	Specification
Housing Material	Metal enclosure or ABS DIN-rail enclosure, `UL94 V-0` flame retardant
Standard Dimensions	`80 x 63.8 x 21.3 mm`, DIN-rail version
Mounting	`35 mm` DIN rail, panel screws, or double-sided adhesive
Weight	About `180 g`, including housing and terminal
Protection Rating	`IP20`, indoor installation

Item	Specification
Cooling Clearance	Top and bottom `>=15 mm`, left and right `>=10 mm`, front `>=40 mm`

7. Installation and Wiring

1. **Install the antenna**: Confirm the supplied 4G or GNSS antenna model, tighten it clockwise to the SMA connector, keep it vertical, and avoid metal obstruction.
2. **Insert the SIM card**: Use the included tool to press the yellow eject button, place an activated IoT SIM in the tray, and push it back in.
3. **Wire the power input**: Connect GND to pin 11 and DC positive to pin 12. Verify polarity and voltage range before power-up. An external `2 A` fuse is recommended.
4. **Connect the serial port**: Use RS232 on pins 2 and 3 or RS485 on pins 4 and 5. Use shielded twisted pair and proper grounding. If a secondary TTL UART is required, connect pins 7 and 8.
5. **Connect IO and analog signals**: Wire dry or wet contacts to IO1 and IO2 as needed and keep the analog signal within `0 to 8 V`.
6. **Mount the device**: Snap it onto a `35 mm` DIN rail or secure it with screws to prevent loosening in vibration-prone environments.
7. **Power on and commission**: Check the Net, Server, and Data/GPS LEDs, then complete parameter configuration and connectivity testing through the serial port or remote platform.

8. Important Notes

1. **Power Requirements**: Use a stable DC power source with sufficient current margin to avoid voltage drop caused by shared high-power loads.
2. **Antenna Separation**: 4G and GNSS antennas are not interchangeable. Keep at least `30 cm` apart and ensure proper grounding.
3. **Data Security**: HTTPS and MQTTS are optional. They must be enabled on the platform side with correct certificate configuration.

4. **Firmware Upgrade**: Perform OTA only on a stable network and never power off during upgrade.
5. **Lightning Protection**: In outdoor or high-surge environments, use surge protection and proper grounding to protect the communication interfaces.