YZW900L

Industrial LoRaWAN Gateway

DATASHEET



Smart agriculture

Utility metering

Smart city

Industrial IoT

Asset tracking

4G LTE Backhaul

8-ch LoRaWAN® SX1302

9–48 V DC

IP67 • −40~70 °C

DATASHEET

Features

Cellular

Cellular backhaul	4G LTE; cellular module and supported bands depend on the regional order configuration; no 5G
Cellular status	RSSI, SINR, RSRP, RSRQ, serving band, IMSI and ICCID
APN and authentication	Configurable APN and account settings with NONE, PAP, CHAP or PAP+CHAP authentication
PDP IP type	IPv4, IPv6 or dual-stack IPv4v6 cellular data connections
SIM switching	Single cellular modem with per-SIM profiles and switching policies; dual SIM does not mean two concurrent cellular links

LoRaWAN Gateway

Concentrator	Semtech SX1302; one 8-channel module as standard; a second module is optional
Receive channels	8 multi-SF channels per module, SF5–SF12; standard LoRa and FSK channel settings
Independent instances	Up to two independently configured gateway instances with the dual-module option; separate EUI, server, ports and radio settings
Channel planning	Each module has its own channel plan; two modules configured with overlapping frequencies do not provide 16 distinct frequency channels
Packet forwarding	Semtech UDP packet forwarding to the local or an external LoRaWAN network server; configurable uplink and downlink ports
Radio configuration	Automatic regional templates or manual radio-chain frequencies, TX enable, multi-SF channel allocation and IF offsets
Region selection	Region and sub-band options are constrained by the ordered RF hardware and license family; not unrestricted cross-band switching
Gateway parameters	Configurable Gateway EUI override, antenna gain and gateway coordinates; per-instance operating state and radio reset

Local LoRaWAN Network Server

Network server	Built-in ChirpStack 4.18.0 as standard; local activation, uplink processing, downlink scheduling and ADR without a public-cloud LNS
Protocol and activation	LoRaWAN 1.0.x / 1.1; OTAA or ABP selected through the device profile and device keys
Device classes	Class A and Class C; downlinks follow the terminal's receive windows and regional airtime limits
Management	Browser management of tenants, gateways, applications, device profiles and end devices
Payload codec	Configurable JavaScript payload codecs for the connected device format; device-specific codecs are not automatic universal sensor compatibility
Gateway registration	Automatic registration of local gateway instances; separate identities for the optional second module
Persistent data	Tenant, device and session data stored in NAND Flash; Redis is runtime cache; local LNS data is retained during normal upgrades and factory reset
Service management	Separate LNS enable/disable and administrator-password reset; ChirpStack gRPC API with its own authorization
Deployment capacity	Depends on reporting interval, payload, radio airtime and local application load; no fixed terminal-count or polling-rate guarantee

LoRaWAN MQTT Integration

Application events	ChirpStack MQTT integration publishes uplink and device events as JSON; payload decoding follows the configured device codec
Uplink topic	application/{applicationId}/device/{devEui}/event/up; applicationId is not the JoinEUI
Downlink topic	application/{applicationId}/device/{devEui}/command/down
Downlink payload	JSON fields devEui, confirmed, fPort and Base64 data; for example {"devEui":"0102030405060708","confirmed":false,"fPort":10,"data":"AQI="}
Delivery boundary	Queue acceptance does not prove terminal execution; Class A waits for a receive window after an uplink; application execution must be confirmed separately
Internal message bus	TCP port 1883 is reserved for the internal LoRaWAN MQTT service; the user-configurable broker is a separate service

Node-RED

Flow development	Built-in Node-RED 3.0.2, enabled in standard shipments, with browser-based flow editing and persistent flow storage in NAND Flash
Installed nodes	Modbus TCP/serial nodes, MQTT and serial runtime components; additional packages require compatibility with the installed runtime
Maintenance	Runtime status, editor access, download-source settings, admin password change, runtime-package upgrade and flow reset
Serial-port ownership	The single physical RS485 port is exclusive to one PLC, Modbus RTU, DTU, cloud remote-serial or Node-RED instance at a time

Wireless (Optional)

Wi-Fi option	Optional dual-band Wi-Fi with external antennas on both sides of the enclosure
Wireless operating mode	2.4 GHz IEEE 802.11b/g/n/ax and 5 GHz IEEE 802.11a/n/ac/ax; AP or STA mode
Channel widths	2.4 GHz: 20/40 MHz; 5 GHz: 20/40/80/160 MHz; available channels depend on the configured regulatory region
Wi-Fi security	WPA/WPA2/WPA3 and WPA2/WPA3 mixed modes with AES encryption
SSID and clients	Configurable SSID broadcast and AP isolation; multiple wireless clients in AP mode

Ethernet

Ports	2 × RJ45 Gigabit Ethernet ports, default 1 × WAN/LAN1 + 1 × LAN2; weatherproof cable entries

Network

Routing	Static routes with destination network, gateway, outgoing interface and route metric settings
Network protocols	TCP, UDP, IPv4/IPv6, ICMP, ARP, DHCP, DNS, NTP, HTTP/HTTPS, SSH2 and MQTT
WAN access	Static IP, DHCP and PPPoE uplinks with IPv4/IPv6 configuration
Connection monitoring	ICMP reachability checks with configurable primary/backup targets, source interface, interval, retry count and recovery action
DHCP	IPv4 DHCP server with address pool, lease time, gateway/DNS settings and static IP-to-MAC assignments; configurable stateful/stateless IPv6 address allocation
Cellular link monitoring	Cellular connectivity monitoring with configurable IPv4/IPv6 probe targets
NAT	IPv4 DNAT, SNAT, MASQ and DMZ rules for port forwarding and address translation
QoS	Upload/download traffic rules by interface, subnet and optional port, with base rate, ceiling rate and priority settings
DDNS	Configurable DDNS provider, account/token, domain and update interval, with an IPv6 update option
Uplink failover	Link priority, ICMP health checks and primary/backup uplink failover
Load balancing	Uplink traffic distribution by source IP or session, with ICMP link health checks
Uplink policy constraints	Load balancing cannot operate together with multi-link primary/backup policies or WireGuard IPv4 full-tunnel routing; it does not aggregate bandwidth for a single connection
VLAN	Up to 10 entries, VID 4–4094; Tagged/Untagged VLAN traffic on available LAN ports, with per-VLAN IPv4 subnet and DHCP server settings

Security

Firewall	Stateful packet filtering with management-service access controls by network zone
Attack prevention	Configurable DDoS limiting, IP-spoofing, port-scan and SYN-flood rules, with multicast and IDENT restrictions
Address filtering	Blacklist/whitelist modes with IP-only, MAC-only or combined IP/MAC filtering, and protocol, port and interface-based access rules
LAN Internet access restriction	When enabled, blocks direct Internet forwarding from LAN clients through ordinary uplinks; retains local LAN communication and VPN/m2mCloud forwarding, subject to the other firewall rules
Domain filtering	Disabled, blacklist or whitelist modes with configurable domain rules

VPN

OpenVPN	Two client instances and an independently running server
WireGuard	IPv4 encrypted tunnels with up to 10 peers, optional pre-shared keys, persistent keepalive and remote-subnet routes
ZeroTier	Join up to 10 ZeroTier virtual networks, with configurable acceptance of controller-managed addresses and routes; controller authorization is required
IPsec	IKEv1/IKEv2, pre-shared-key authentication, tunnel/transport modes and local/remote subnet configuration
L2TP	L2TP client/server with PPP authentication, client address pools and subnet routes; L2TP itself does not encrypt traffic
DMVPN	Hub/Spoke dynamic multipoint VPN using mGRE, NHRP and IPsec
VXLAN	VXLAN Layer 2 tunnels with VNI, remote endpoint and UDP port settings; VXLAN itself does not encrypt traffic
GRE	GRE tunnels for existing-network interconnection; GRE itself does not encrypt traffic
PPTP	PPTP client/server with account authentication and PPP settings for legacy-network compatibility

PLC & Instrument Acquisition

Protocol options	64 protocol variants: 39 network and 25 serial options; selected according to the connected PLC or instrument
PLC families	Siemens S7/PPI, Mitsubishi MC/FX, Omron FINS/HostLink/CIP, Inovance, Keyence, Delta, Panasonic, Xinje, Beckhoff ADS, Allen-Bradley and others
Instrument protocols	Modbus TCP/RTU/ASCII and over-TCP variants, CJ/T 188, DL/T 645, DL/T 698 and IEC 60870-5-104 options
Configuration capacity	Up to 10 connections and 2500 points per connection; up to 10000 enabled points in total with the standard 512 MB RAM configuration; these are configuration limits, not scan-rate guarantees
Point configuration	Point name, identifier, address, data type and read/write mode; configurable per-connection polling interval
Point-table management	CSV import/export, point editing and monitoring; available operations depend on the selected protocol
Serial-port ownership	The single physical RS485 port is exclusive to one PLC, Modbus RTU, DTU, cloud remote-serial or Node-RED instance at a time

PLC Data Reporting

Reporting protocol	MQTT; up to 10 reporting rules, each selecting 1 or more configured PLC data sources
Message format	Format 1 JSON: deviceId, deviceName, params, status, reason, because; params point objects contain identifier, name, source, type and string value; report status is numeric 0/1, not a write reply
Connection and topics	Server, port, credentials, 1–86400 s reporting period, publish/subscribe/reply topics and CA certificate; optional SN suffix is configured independently for each topic

PLC Cloud Writes over MQTT

Downlink topic	Publish to the enabled rule's effective subscription topic, not its publish/reply topic; when SN suffix is enabled, append /SN using the device's actual SN
JSON fields	A single JSON object, 1–4096 UTF-8 bytes; identifier/name/addr selectors and value are strings; source or data_source is a data-source name selected in this rule
Example request	{"source":"PLC_A","identifier":"1","value":"25.5"}
Matching and permissions	Use source + identifier for unambiguous selection; without source, the first matching point in rule source order is used; the point must be writable and its value/type valid
Execution result	With a reply topic configured, replies contain status=success/failure, reason and the request in data; write_applied means protocol-write success, not physical-state readback; reply QoS is 0
Reply example	{"status":"success","reason":"write_applied","data": {"source":"PLC_A","identifier":"1","value":"25.5"}}
Failure handling	Missing/read-only points, invalid values or unavailable connections can fail writes; a timeout or absent reply does not prove no write occurred; read back before retrying
Safety and format boundary	Use retain=false and compatible PLC programming/access policies; this string-value format and execution reply do not apply to the independent Modbus collector

Modbus Acquisition & Reporting

Acquisition mode	Modbus TCP/RTU master polling with device and command configuration; RTU uses an available Serial1 port
Read function codes	01 Read Coils; 02 Read Discrete Inputs; 03 Read Holding Registers; 04 Read Input Registers
Data types and byte order	Web-selectable types: signed/unsigned 16-bit integers; signed/unsigned 32-bit integers (ABCD); 32-bit floating point (ABCD/CDAB byte order)
Device and command management	Up to 16 device connection profiles and 32 commands per profile; each RTU profile exclusively owns its selected serial port, with slave addresses configured per command
Command configuration	Command name, slave address, Modbus register start/count, IEC104 mapping address, Writable flag and per-command polling period
Acquisition and reporting timing	Per-command polling period: 1–86400 s; response timeout: 30–120000 ms; MQTT/TCP/UDP periodic reporting interval: 1–86400 s
Data reporting	MQTT/TCP/UDP: immediate or periodic reporting; in periodic mode, each point's first sample is sent immediately and later reports use fresh samples only; IEC104 updates immediately
MQTT settings	Broker address/port, account authentication and CA certificate configuration; per-device publish/subscribe topics, with MQTT downlink writes for writable commands
IEC 60870-5-104 settings	Communication port, common address and information object address (IOA) mapped from each command's mapping address; the IOA is not the slave's Modbus register address
Serial-port ownership	The single physical RS485 port is exclusive to one PLC, Modbus RTU, DTU, cloud remote-serial or Node-RED instance at a time

Modbus Cloud Writes over MQTT

Connection prerequisites	Enable Modbus collection and select MQTT reporting. Connect the cloud client and collector to the same MQTT broker, with the required authentication and topic permissions; TCP/UDP reporting does not accept MQTT downlink writes
Device-side configuration	Configure the target device connection and commands, including slave address, read function, start address, quantity and data type. Enable Writable for each controlled command; its name becomes the JSON key
Downlink topic	Set a non-empty, device-specific Subscribe topic. The cloud publishes to this exact topic, not the device's Publish topic. Avoid shared control topics and +/# wildcards
JSON payload	Use a flat JSON object, e.g. {"command_name":123}. Each key matches a configured command name and each value is a JSON number; no device-ID, address, function-code or nested data envelope is required
Integer and coil example	Topic: plant/site1/plc1/set; payload: {"run":1,"setpoint":1200}. Configure run as a writable coil and setpoint as a writable uint16 holding-register command before sending
Floating-point example	{"temperature_set":25.5}; temperature_set must be a writable floating-point holding-register command with the correct byte order and at least 2 consecutive registers configured
Coil write	A writable command configured for read function 01 uses write function 05. Send numeric 0 or 1 for OFF or ON; JSON false/true are not accepted as numeric values
Holding-register write	A writable command configured for read function 03 uses write function 06 for a 16-bit value, or function 16 (0x10) for a 32-bit value occupying 2 consecutive registers
Read-only areas	Read functions 02 (discrete inputs) and 04 (input registers) are not writable, even if Writable is enabled. Unconfigured or non-writable commands are skipped
Value validation	Use values within the configured type's range. Integer types reject fractional values; floating-point commands accept finite numbers. Strings, Boolean values, arrays, objects and null are not write values
Address and byte order	The collector reuses the configured slave and 0-based Modbus PDU start address, then encodes the value using the configured type/byte order. Mapping addresses are not MQTT downlink selectors; apply any slave-specific scaling in the cloud
Multiple commands and arrays	An object may contain multiple command keys, processed independently rather than as an atomic transaction. Each key writes a scalar at its configured start address; arbitrary register-array block writes are not supported
Payload size	Payload length: 1–511 bytes after UTF-8 encoding. Empty payloads and messages of 512 bytes or more are discarded; send valid JSON with numeric values
Execution confirmation	MQTT delivery is not Modbus execution confirmation. There is no dedicated MQTT write-response payload; check subsequent collected readback and device logs. Disconnections, a full queue or slave errors may prevent a write
Control-message safety	Publish control messages with retain=false to avoid replaying old commands when subscriptions reconnect. Restrict write access using broker topic permissions and prevent unconfirmed or repeated control actions
Example and firmware scope	The topics, command names and values above are examples, not defaults; configure them against the slave register map. Requires collector firmware with MQTT downlink writes; available types and byte orders follow the delivered firmware

Application Services

DTU transparent transmission	Serial-to-TCP/UDP client or server operation, with primary/backup servers, login data, heartbeat and timeout settings
DTU MQTT	Serial data over MQTT using plain TCP or TLS; configurable CA certificate, credentials, client ID, publish/subscribe topics, QoS 0/1/2 and keepalive
Modbus protocol gateway	Bidirectional protocol conversion between Modbus TCP and serial Modbus RTU/ASCII, for connection to a serial master or slave device
DNP3 forwarding	Bidirectional DNP3 frame forwarding between serial and TCP; active TCP connection (master) or incoming TCP connection (outstation)
User MQTT Broker	Separate plain/TLS listener with address, port, anonymous or username/password authentication and server certificates; use an available port other than reserved 1883
SNMP	SNMPv2c/SNMPv3 management and SNMPv2c Trap reporting; configurable community, Trap destination and SNMPv3 authentication/privacy parameters
Scheduled tasks	Scheduled device or cellular-modem restart by day of week and time
SMS	SMS sending with character-set selection and a trusted-number list
SMTP and event alarms	SMTP email with optional STARTTLS/TLS; email/SMS notifications for configured events such as weak signal, modem-status changes, failed logins and firewall attacks
Network diagnostics	Ping and traceroute diagnostics with configurable target and source IP

Management & Maintenance

WEB UI	HTTP/HTTPS management for status, configuration and maintenance; HTTPS is enabled through the management-access settings
CLI	SSH2/Telnet command-line access with configurable management-service permissions
Administrator password	Router Web management only supports changing the existing admin password; local ChirpStack accounts are managed separately
Configuration management	Configuration export/import and factory reset
Logs	Event/system logs, service runtime status and remote-log server/port settings
Time synchronization	NTP server and backup server, synchronization interval and time-zone settings, plus manual time entry

m2mCloud Remote Access

Remote networking	Cloud-authorized L3 routed or L2 bridged access to on-site networks; the tunnel mode is assigned by the cloud platform
Connectivity	Peer-to-peer connectivity or server relay, subject to network conditions and platform authorization; a public IP is not required at the site
Remote subnets	Up to 10 remote IPv4 subnet routes in L3 mode; rules remain saved but inactive in L2 mode; default routes are not accepted
Program upload/download	Use compatible vendor PLC/HMI programming tools for remote program upload/download, debugging and maintenance over the authorized channel
Remote serial access	Authorized access with the platform serial-proxy client; the selected physical port must be available
Connection recovery	Automatic reconnection of the cloud management session and tunnel after connectivity recovers, with valid platform authorization
Operational benefits	Centralized remote access for distributed sites, reducing on-site visits and repeated local network setup; compatibility depends on the end device and vendor tool

Hardware Features

CPU	MT7981B, dual-core ARM Cortex-A53, 1.3 GHz
RAM	512 MB DDR3
Flash	512 MB SPI NAND Flash as standard
GPS option	Optional onboard GPS with a dedicated GPS antenna connector; specify when ordering

System Characteristics

Operating system	OpenWrt-based Linux
Kernel version	Linux 5.4
Script runtimes	Shell, Python 3.9.17 and Node.js 18.16.1

Firmware

Update	Web firmware upload with a choice to retain the configuration or restore factory settings after upgrade

Power

Input	9–48 V DC through V+ / V−; no PoE powered-device function
Power consumption	Reference < 6 W; actual consumption depends on fitted modules, options and operating state

Physical Interfaces (Ports, LEDs, Antennas, Buttons, SIM)

Ports	2 × RJ45 Gigabit Ethernet ports, default 1 × WAN/LAN1 + 1 × LAN2; weatherproof cable entries
Serial	1 × RS485 as standard; A/B on a white internal board connector, not exposed on the enclosure; software port Serial1
Digital output	1 × DO, 12 V DC / 1 A
Status LEDs	6 LEDs, top to bottom: left column SIG (cellular signal), NET (cellular link), PWR (power); right column LORA2/LORA1 (LoRaWAN instance running status), WIFI (Wi-Fi status)
SIM	2 × internal pull-out SIM trays, 1.8 V / 3 V; single modem with SIM switching
Antenna connectors	Top: LORA1, optional LORA2, optional GPS, Cellular1 and Cellular2; optional Wi-Fi antenna connectors on both sides
Reset	1 × RESET button; release before 5 s to reboot; hold for at least 5 s and release to restore factory settings

Physical Specification

Casing	Die-cast metal enclosure
Dimensions (W × H × D)	217.30 × 164.00 × 52.00 mm
Weight	1063 g
Mounting	Pole mounting

Operating Environment

Operating temperature	−40 °C ~ +70 °C
Storage temperature	−40 °C ~ +85 °C
Operating humidity	< 95 % non-frosting
Ingress protection	IP67

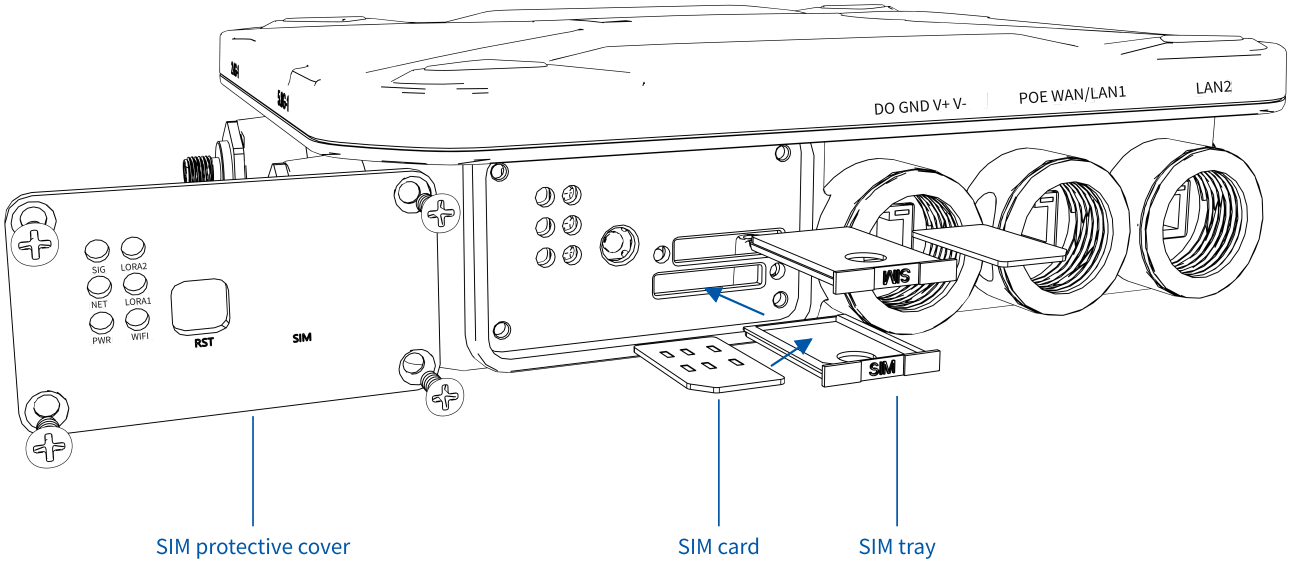
EMC Reference Standards

Standards	Draft EN 301 489-1 V2.2.0, Draft EN 301 489-17 V3.2.0, Draft EN 301 489-52 V1.1.0 FCC 47 CFR Part 15B (2017), ANSI C63.4 (2014)
ESD	EN61000-4-2: 2009
RS	EN 61000-4-3: 2006 + A1: 2008 + A2: 2010
EFT	EN 61000-4-4: 2012
Surge immunity (AC Power Line)	EN 61000-4-5: 2006
Surge immunity (Ethernet ports)	EN 61000-4-5: 2014, clause 7.1 of ITU-T K21
CS	EN 61000-4-6: 2009
DIP	EN 61000-4-11: 2004
Safety / RF	FCC Part 15B • CE RED

DATASHEET

Hardware Installation

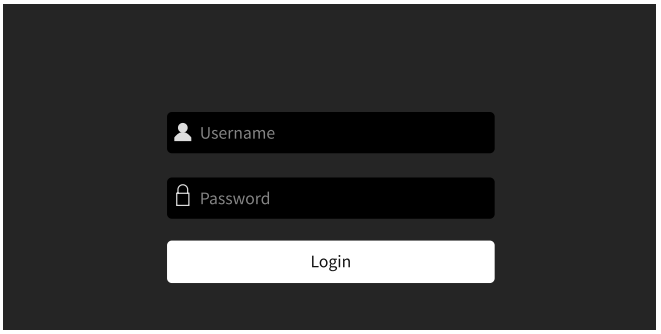
1. Secure the gateway to the pole using the supplied pole-mount kit.
2. Open the SIM protective cover and withdraw the SIM1 or SIM2 tray. Place the SIM card in the tray with the notched corners aligned, slide the tray fully back in, then refit and secure the cover.
3. Connect LoRaWAN antennas to LORA1 and optional LORA2, and cellular antennas to Cellular1/Cellular2. Fit GPS and side Wi-Fi antennas only with the corresponding options.
4. Connect 9–48 V DC to V+ / V− with the correct polarity; this model is not powered through PoE.
5. Connect the Ethernet cables through the weatherproof entries. DO provides 12 V / 1 A; the standard RS485 A/B connector is inside the enclosure, not an external port.

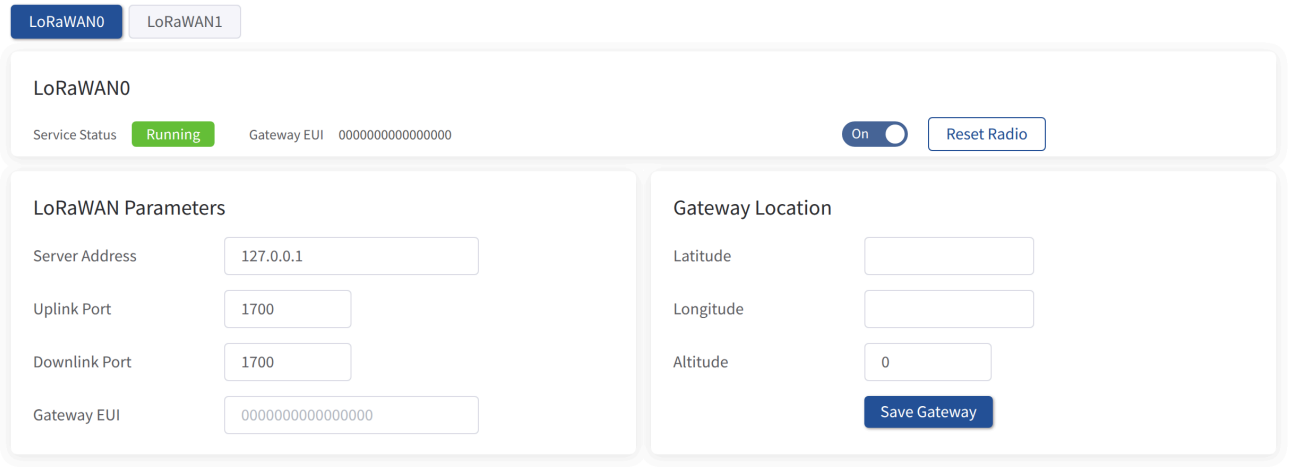


SIM Card Installation

Login to Device

1. Confirm the management address from the device label or delivery documents; the default is http://192.168.8.1.
2. Log in using the supplied credentials and check cellular and LoRaWAN operating status.





LoRaWAN gateway parameters and location settings (identifiers masked)

Technical Information

Radio Specifications

RF technologies	4G LTE and LoRaWAN; dual-band Wi-Fi and GPS reception optional
LoRa RF reference	Maximum +27 dBm (typical +26 dBm); reference sensitivity down to −141 dBm; subject to fitted RF module, band and operating parameters

Antenna Specifications

Cellular antenna	SMA male; antenna frequency range and gain matched to the ordered cellular configuration
LoRaWAN antenna	SMA male; antenna frequency range and gain matched to the ordered LoRaWAN RF configuration
GPS antenna	Optional GPS L1 antenna, 50 Ω, SMA male

Antenna versions follow the ordered radio modules. Longer antenna feeders cause greater signal attenuation; installation must comply with local RF regulations.

DATASHEET

What's in the Box

- 1 × YZW900L device (Standard)
- 1 × Packaging box (Standard)
- 1 × 2-pin power terminal, 3.5 mm (Standard)
- 2 × 4G cellular antenna (Standard)
- 1 × LoRaWAN antenna (Standard)
- 1 set × Pole bracket and clamps (Standard)
- 1 × Outdoor shielded Ethernet cable, 1 m (Standard)
- 1 × Second LoRaWAN antenna (Optional)
- 1 × GPS antenna (Optional)
- 2 × Wi-Fi antenna (Optional)
- 1 × DC power adapter and matching lead (Optional)



 YZW900L Standard • 1	 4G cellular antenna Standard • 2	 LoRaWAN antenna Standard • 1
 GPS antenna Optional • 1	 Outdoor shielded Ethernet cable, 1 m Standard • 1	 Pole bracket and clamps Standard • 1 set
 2-pin power terminal, 3.5 mm Standard • 1	 Second LoRaWAN antenna Optional • 1	 Wi-Fi antenna Optional • 2

Standard accessories are supplied with the base configuration; optional accessories are selected separately.

DATASHEET

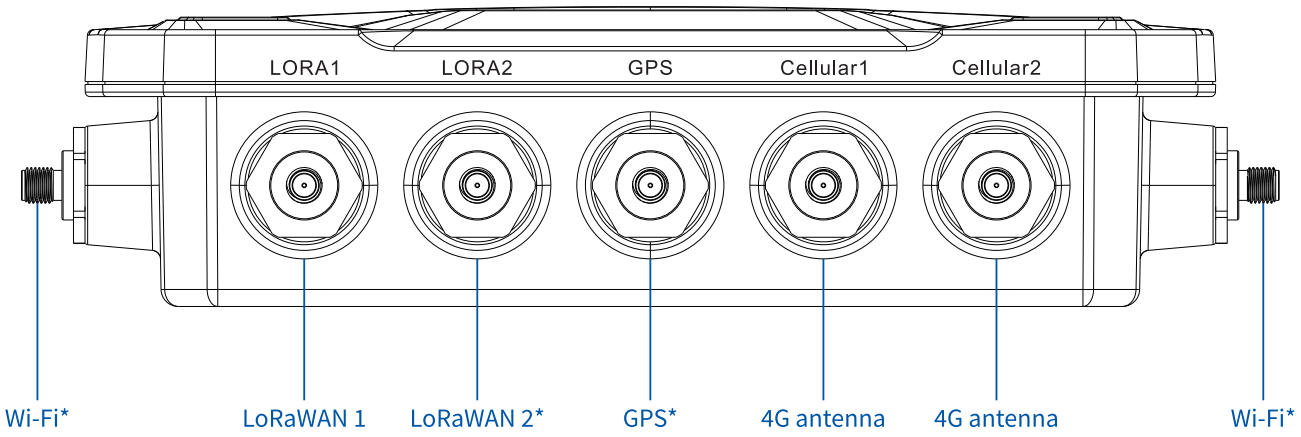
Available Versions

Product	Configuration	Description
YZW900L	Standard	4G LTE; one SX1302 module with 8 channels; built-in ChirpStack and Node-RED
YZW900L	LoRaWAN expansion	Optional second SX1302 module with a separate LORA2 antenna connector
YZW900L	Hardware options	Optional GPS and dual-band Wi-Fi; external Wi-Fi antennas on both sides

Confirm cellular and LoRaWAN bands, single/dual concentrators, GPS and Wi-Fi when ordering. Software region choices must match the fitted RF hardware and license.

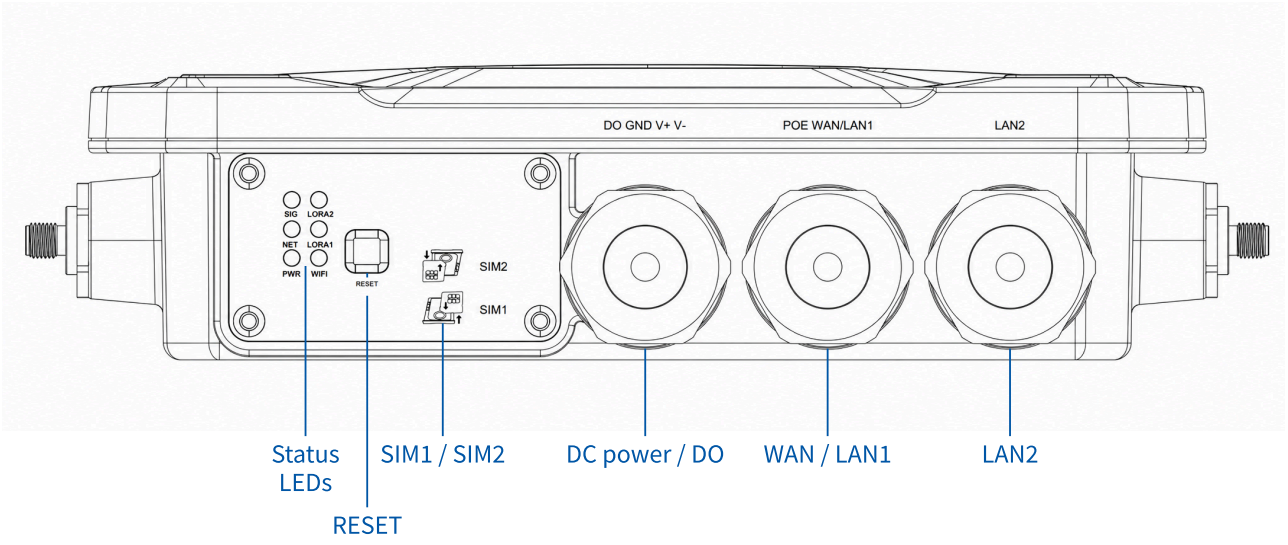
DATASHEET

Hardware Interfaces



* Optional

Antenna connectors



Bottom interfaces

LORA2, GPS and side Wi-Fi are order options. RS485 is an internal board connector. The shared enclosure's PoE marking does not indicate PoE power support for YZW900L.

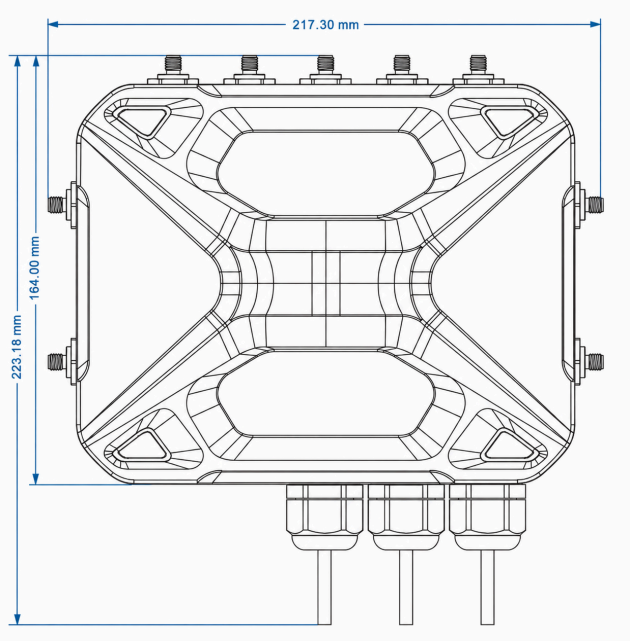
DATASHEET

Dimensions & Weight

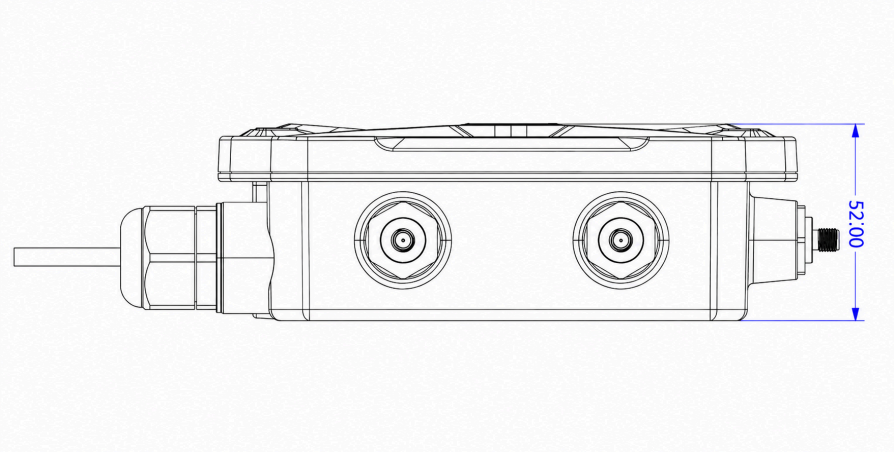
Main Measurements

Dimensions (W × H × D)	217.30 × 164.00 × 52.00 mm
Weight	1063 g

Housing dimensions exclude antenna connectors, screws and other protrusions; see the measurement positions in the drawings.



Top-view dimensions



Side-view dimensions

DATASHEET

Mounting Space Requirements

Allow clearance for pole mounting, antennas and cables as illustrated.

