SENARCH

Datasheet

SenArch Off-Grid LoRaWAN Gateway

Revision: 1.2.2

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The SenArch LoRaWAN Gateway is an extremely low-power, self-sustainable, compact and modular gateway.
This allows for easy and quick deployment in any off-grid location where IoT connectivity is needed. The benefits are data from LoRaWAN sensors in hard-to-reach areas at significantly lower deployment complexity and reduced costs by up to 75%.

The solar panel charges the battery via a built-in solar charge controller, providing enough power to make the product operational all year round in most environmental conditions.

The device can relay data back via either Wi-Fi or Cellular technologies. It supports external LoRa and cellular antennas for optimal coverage.

The gateway can be remotely monitored and managed via the SenArch out-of-band device management unit, with its own built-in battery with power for over 60 days of operation. The power management unit transmits state-of-health and power data via LoRaWAN, by creating a mesh network with other gateways, thereby providing operational intelligence of the LoRaWAN network.

Application:

- Smart City
- Energy & Utility
- Industry
- Farming & Agriculture
- Environmental protection
- Building Management
- Construction
- Any other off-grid IoT use cases

Key Software Features

- Energy-efficient power management
- Over-The-Air firmware upgrade (OTA)
- Remote monitoring and management
- Cellular and Wi-Fi backhaul configuration
- Integration with 3rd party network servers
- Local Wi-Fi hotspot connection
- Power measurement visualization software

Key Hardware Features

- External LoRa and LTE antennas
- 50-100 Ah AGM battery*
- 50-150 W solar panel*
- Solar panel mounting equipment
- Flexible mounting on pole, tower, roof or wall
- LoRa: Time division duplex with 8 Rx & 1 Tx
- LTE-CATM1 and NB-IOT cellular backhaul
- -30° to +65° Celsius operating temperature
- GPS with internal antenna

*Depending on the environmental conditions

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Technical and Functional System Specifications

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Mechanical Parameters

Operational temperature	-30° to +65° C
Ingress protection - Gateway cabinet	IP67
Ingress protection - Battery enclosure	IP66
Weight	Solar panel mounting kit: 2.5 kg Gateway enclosure: 3 kg Antenna kits: 2 kg* Battery enclosure: 8 kg
Size	Gateway enclosure: 320 x 220 x 150 mm Battery enclosure: 400 x 300 x 200 mm
Cable lengths	Battery to gateway: 3 m Solar panel to gateway: 1 m LoRa Antenna: 3 m LTE Antenna: 3 m

* Includes antennas, lightning arresters, mounting & cables

Total system parameters

Total weight	15.5 kg*
Total average power consumption	1.41 W using cellular backhaul** 0.8 W using Wi-Fi backhaul
Total average current draw	111 mA @ 12.7 V

* Without batteries, solar panel and packaging
** Without GPS

Power Generation & Storage

150 W solar panel*	Weight: 8 kg Size: 890 x 870 x 25 mm**
100 W solar panel*	Weight: 7 kg Size: 970 x 565 x 25 mm**
50 W solar panel*	Weight: 5 kg Size: 640 x 456 x 30 mm**
100 Ah AGM battery*	Weight: 28 kg Size: 330 x 171 x 224 mm**
50 Ah AGM battery*	Weight: 16 kg Size: 229 x 132 x 210 mm**

* Depending on the environmental conditions
** Dimensions are vendor dependent and can vary slightly

Backhaul connectivity

Cellular	LTE CAT M1 or NB-IoT*
Wi-Fi	IEEE 802.11 b/g/n

* Including GPS

LoRa Radio Parameters

LoRa concentrator	SX1302/3
Channels	8
ISM bands	Supports all global bands
Modulation	LoRa/(G)FSK
Tx power	14 dBm to 26 dBm
Rx sensitivity	-141 dBm @ 125 KHz/SF12 -121 dBm @ 125 KHz/SF7
Overall power consumption SX1302	Emitting: 454 mA @ 5 V Receiving: 42 mA @ 5 V Sleep: 11 mA @ 5 V
Overall power consumption SX1303	Emitting: 427 mA @ 5 V Receiving: 40 mA @ 5 V Sleep: 8 mA @ 5 V

Connectors

Solar panel	MC4 connectors
Battery power	Waterproof aviation plug, SP21
LoRa antenna	N-Type female connector with externally attached lightning arrester
LTE antenna	

Gateway enclosure also N-type female connector, coaxial cable also N-type connector male to male

Solar Charge Controller

Max solar load	10 A
Max volt on PV(@ -25°C)	40 V
Max input power	150 W
System voltage	12 V
Max volt on battery terminal	20 V
Battery type	AGM
Self-consumption	7 mA