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# ioLINK Series indoor LoRaWAN<sup>®</sup> Gateway

## MicroGTW-IDV

## Datasheet

**Document Version:**  
**SSTPL/HW/LGTW/ $\mu$ GTW-IDV/1.0**  
**Preliminary**

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# 1. Brief Description

MicroGTW-IDV is a compact, low cost, low power wide area network (LPWAN) wireless Gateway which supports Semtech LoRaWAN® long range wireless protocol.

This new indoor IoT Gateway measures just 150x150 mm, is housed in an ABS Enclosure and comprises a Semtech SX1302 Based-band Processor along with a pair of SX1257, a highly integrated RF Front End with Multi-PHY Mode & I/Q Modem on Chip transceiver. The MicroGTW-IDV complies with the latest LoRaWAN® Class A & C protocol specifications and it made it quite simple to access LoRaWAN® IoT platforms.

## 1.1 Features

- Commercial Grade Indoor LoRaWAN® Network Gateway
- Works on Semtech LoRa® Packet Forwarder
- Default Ethernet Back-haul, Automatic Fallback to WiFi/2G Cellular
- Range up-to to 5 km Line of Sight
- Ambient operating Temperature -20 to 75 °C
- Suitable for small in-building Private LoRaWAN® Network

## 1.2 Applications

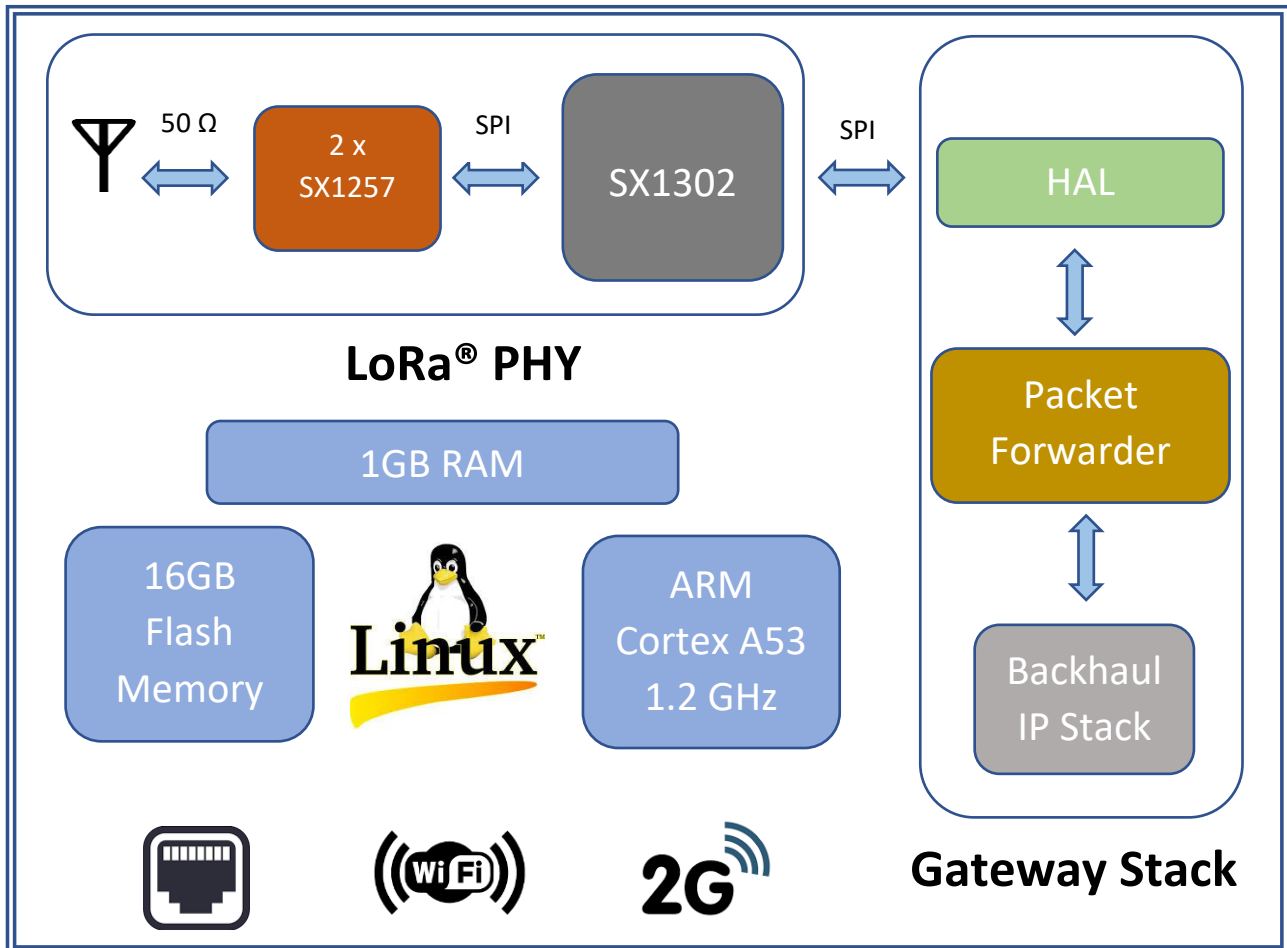
Typical applications for this module include smart metering, wearables, tracking, M2M and internet of things (IoT) edge nodes.

The module's applications are as following -

- Automated Meters Reading
- Home and Building Automation
- Wireless Alarm and Security Systems
- Industrial Monitoring and Control
- Long Range Irrigation Systems

## 2. Gateway Overview:

MicroGTW-IDV is an ultra-long range, high-performance, LoRaWAN® Gateway for wireless communication. It operates in the license free 865-867 MHz ISM frequency band. Its key components are depicted in the following figure.



MicroGTW-IDV is an ultra-compact LoRaWAN® Gateway and creates LoRaWAN® network in few minutes. It is designed to work in indoors and can be used as a Data Aggregator for a building or campus. It comes with a simple User Interface for configuring IP/URL for your choice of LoRa® Network Server.

MicroGTW-IDV comprises 3 major parts on hardware side:

1. LoRaWAN® Gateway RF Board with Power Supply Section
2. Linux Host Processor with Memory & RAM
3. Connectivity Options of Fast Ethernet, WiFi & 2G GPRS

MicroGTW-IDV is a commercial class device and qualifies major requirements of a Commercial Indoor IoT Gateway. LoRaWAN® Gateway RF Board used in this product is based on SSTPL own RF Design which have enhanced RF performance in Transmit as well as Receive Parameters. It uses Semtech Baseband Processor SX1302 and 2 RF Front End SX1257 along with SSTPL own high-performance RF design comprising PA, LNA and ETSI compliant Harmonics Filter.

The Host processor is a 64-bit mini PC and gives virtually no strain in running LoRaWAN® Gateway Stack in Linux environment. MicroGTW-IDV is meant for Indoor use only with Low Latency Ethernet/WiFi backhaul, however it can be connected to LoRa® Network Server on 2G internet backhaul , but performance may be downgraded due to High Latency 2G internet and repeat count of Frame Count may arise.

### 3. Hardware Specifications

| Specs Group          | Key Item                 | Detailed Specs                                  |
|----------------------|--------------------------|---|
| System Configuration | Core                     | Cortex-A53 64-bit                               |
|                      | Clock Frequency          | 1.2 GHz   |
|                      | RAM                      | 1GB SDRAM                                       |
|                      | Flash                    | 16 GB Flash                                     |
| LoRaWAN®             | Baseband                 | SX1302  |
|                      | RF Front End             | SX1257  |
|                      | Max RF Transmit Power    | +27 dBm   |
|                      | Receive Sensitivity      | Down up to -145 dBm on SF12 & 125KHz Channel BW |
|                      | SNR Sensitivity          | up to -20 dBm                                   |
|                      | Frequency                | 865-867 MHz (ISM Band India)                    |
|                      | No. of Channels          | 8 Channels, 125 KHz per Channel                 |
|                      | Spread Factor            | SF7-SF12  |
|                      | Data Rate                | 250 - 5470 bits/sec                             |
| LoRa Antenna Port    | 1 × 50 Ω SMA Female      |   |
| Internet Backhaul    | Wired                    | Ethernet 10/100                                 |
|                      | WiFi                     | 2.4 GHz with on board WiFi Antenna              |
|                      | Cellular                 | 2G GPRS   |
|                      | Cellular Antenna Port    | 1 × 50 Ω SMA Female                             |
| Power Supply         | Default                  | 5V DC thru AC-DC adaptor                        |
|                      | Optional                 | N/A   |
|                      | Power Consumption        | 5W Typical, MAX 6.5W                            |
| Enclosure            | Ingress Protection Level | TBD   |
|                      | Dimensions               | 150x150 mm                                      |
|                      | Weight                   | TBD   |
|                      | Mounting Option          | Tabletop / Wall Mount                           |
| Environmental        | Operating Temperature    | -20°C to +70°C                                  |
|                      | Storage Temperature      | -20°C to +85°C                                  |
|                      | Relative Humidity        | 0% to 90% (non-condensing) at 25°C              |

### 3.1 Transmitter RF Characteristics

| T = 25°C, 866 MHz if nothing else stated |              |     |       |     |      |
|--|--------------|-----|-------|-----|------|
| Parameter                                | Condition    | Min | Typ.  | Max | Unit |
| Frequency Range                          |              | 865 | -     | 867 | MHz  |
| RF Output Power - 865 MHz Band           |              | 25  | 26    | 27  | dBm  |
| Modulation Techniques                    |              |     | LoRa® |     |      |
| TX Frequency Variation vs. Temperature   | -40 to +85°C | -   | ±10   | -   | kHz  |
| TX Power Variation vs. Temperature       |              | -   | ±0.5  | -   | dB   |

## 4. Software & Stacks

### 4.1 LoRaWAN® Gateway Stack

MicroGTW-IDV has highly optimized LoRaWAN® Gateway Software Stack developed by SSTPL comprising LoRa® Physical Layer and LoRa® Packet Forwarder. LoRa® Physical Layer is responsible for handling LoRa® packets received & transmitted to remote LoRa® end node while LoRa® Packet Forwarder converts the packet into IP packets and send/receive them to/from LoRa® Network Server. Both the software used the Linux Host Processor to run and process packets in light Embedded Linux environment.

The Stack also have the intelligence to switch network between Ethernet / WiFi / 2G basis the availability of Internet and priority. This Failover also integrates back with Web Socket between the LoRa® Packet Forwarder and LoRa® Network Server which is major advantage over many DIY or non-commercial LoRaWAN® Gateway available in the market.

### 4.2 User Interface (UI)

MicroGTW-IDV UI is quite simple and easy to use. A user can access the UI by connecting Ethernet on their computer. It is available on 192.168.1.20. Before accessing the UI please modify your computer ethernet settings as below

IP : 192.168.1.XXX (Except 192.168.1.20)

Gateway : 192.168.7.1

Subnet : 255.255.255.0

DNS : 8.8.8.8

A user can configure his choice of LoRa® Network Server by accessing the UI. Network configuration can also be done in quite simple steps. Please refer user manual for more details on UI.

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## 5. Important Notice

### 5.1 Disclaimer

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