



PicoLINK Series LoRaWAN® Gateway

PicoLINKGTW-IDV1

Datasheet

Document Version:

SSTPL/HW/LGTW/pLNKGTW-IDV1/V1.0



Contents

1. Brief Description	3
1.1 Features	3
1.2 Applications	3
2. Gateway Overview	4
3. Hardware Specifications	5
3.1 Transmitter RF Characteristics	6
4. RF Test Reports	6
4.1 Max Conducted RF Power	6
4.2 Unwanted emissions in the spurious domain for Tx mode	7
4.3 Occupied Bandwidth	8
5. Software & Stacks	9
5.1 LoRaWAN® Gateway Stack	9
5.2 User Interface (UI)	9
6. Important Notice	10
6.1 Disclaimer	10
6.2 Contact Information	10
6.3 Revision History:	10

1. Brief Description

The PicoLINKGTW-IDV1 presents an economical and energy-efficient LoRaWAN Gateway solution that seamlessly supports the Semtech LoRaWAN long-range Wireless Protocol. Designed for optimal performance in indoor IoT environments, this gateway is encased within a durable Polycarbonate enclosure which can be used outdoor as well. It is equipped with a Semtech SX1303 Base-band processor in conjunction with a pair of Sx1250 units—a highly integrated RF Front End featuring Multi-PHY Mode and an I/Q Modem on Chip Transceiver.

Furthermore, the PicoLINK-IDV1 demonstrates adherence to the most current LoRaWAN® Class A & C protocol specifications, thus simplifying access to LoRaWAN® IoT platforms.

1.1 Features

- Commercial Grade LoRaWAN® Network Gateway
- Works on Semtech LoRa® Packet Forwarder
- Default 4G Back-haul, also works on Wi-Fi mode.
- Range up-to to 3 km Line of Sight
- Ambient operating Temperature -20 to 75 °C
- Suitable for medium scale Private LoRaWAN® Network

1.2 Applications

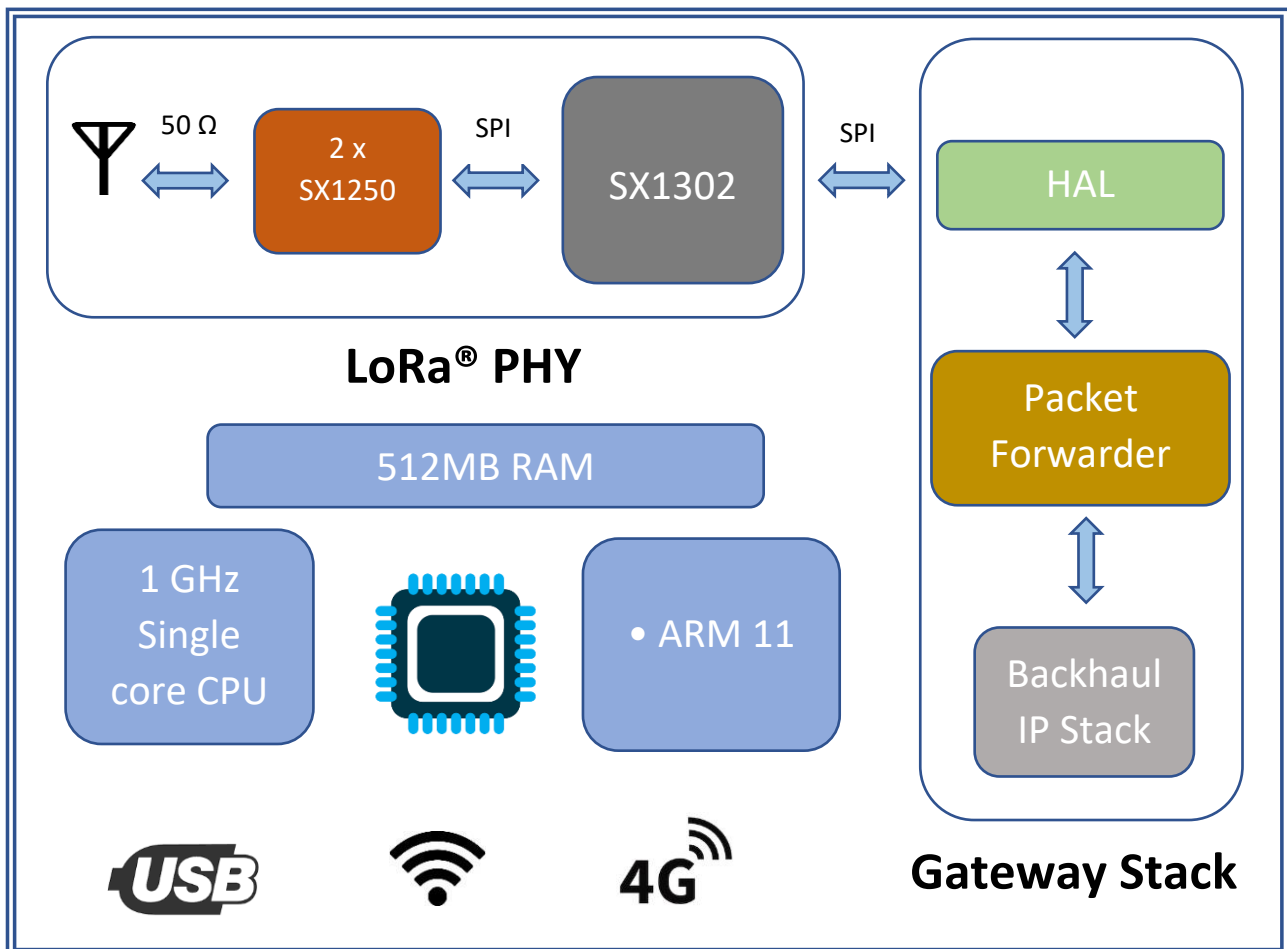
Typical applications for this Gateway include smart metering, wearables, tracking, M2M and internet of things (IoT) edge nodes.

The Gateway'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

PicoLINKGTW-IDV1 is a 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.



PicoLINKGTW-IDV1 is an ultra-compact LoRaWAN® Gateway and creates LoRaWAN® network in few minutes. It is designed to work in indoors as well as outdoor and can be used as a Data Aggregator for open landscapes and large campus. It comes with a simple User Interface for configuring IP/URL for your choice of LoRa® Network Server which is accessible thru USB Port. It also supports battery backup which can run gateway in standby mode up-to 24 hours once battery is fully charged.

PicoLINKGTW-IDV1 comprises 4 major parts on hardware side:

1. LoRaWAN® Gateway RF Board with Power Supply Section
2. Host Microcontroller Unit with Memory & RAM
3. Connectivity Options of 4G LTE (Dual SIM) with limited Wi-Fi access

4. Battery for Power Fail backup along with its charging circuit.

PicoLINKGTW-IDV1 is a commercial class device and qualifies major requirements of a Commercial 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 SX1303 and 2 RF Front End SX1250 along with SSTPL own high-performance RF design which is ETSI compliant for Harmonics Filters etc.

The Host is a 32-bit Microprocessor and optimized in running LoRaWAN® Gateway Stack in Embedded environment. PicoLINKGTW-IDV1 is meant for indoor use with Low Latency 4G backhaul.

3. Hardware Specifications

Specs Group	Key Item	Detailed Specs
System Configuration	Core	ARM11 Single-core 32-bit v6
	Clock Frequency	1 GHz
	RAM	512 MB
	On Board Memory	SD-Card 32 GB
LoRaWAN®	Baseband	SX1303
	RF Front End	SX1250
	Max RF Transmit Power	Up to +27 dBm
	Receive Sensitivity	Down up to -137 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	Enclosure Mount Antenna
Internet Backhaul	Wired	N/A
	WiFi	Limited Coverage
	Cellular	4G LTE (Dual SIM)
	Cellular Antenna Port	Not Available (Internal Antenna Used)
Power Supply	Default	12V DC
	Inbuilt Battery	Optional (8 Hour Backup for full Utilization, 24 Hrs standby)
	Power Consumption	4.5W Typical, MAX 7.5W (4.5W Typical, Max 15W for Batt)
Enclosure	Ingress Protection Level	IP68
	Dimensions	106*94*50mm
	Weight	400 gm without Battery, approx. 1 kg with battery
	Mounting Option	Pole Mount / 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	Typical	Max	Unit
Frequency Range		865	-	867	MHz
RF Output Power - 865 MHz Band		26	26.8	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. RF Test Reports

EUT Test Configuration: - Transmit on Max power on each 125 KHz Channel, Transmission on 1st, Mid and Last channel in each 15 minutes.

EUT Height: - 0.8m from Ground (EUT placed on nonconductive table).

Voltage: - PoE 56V DC

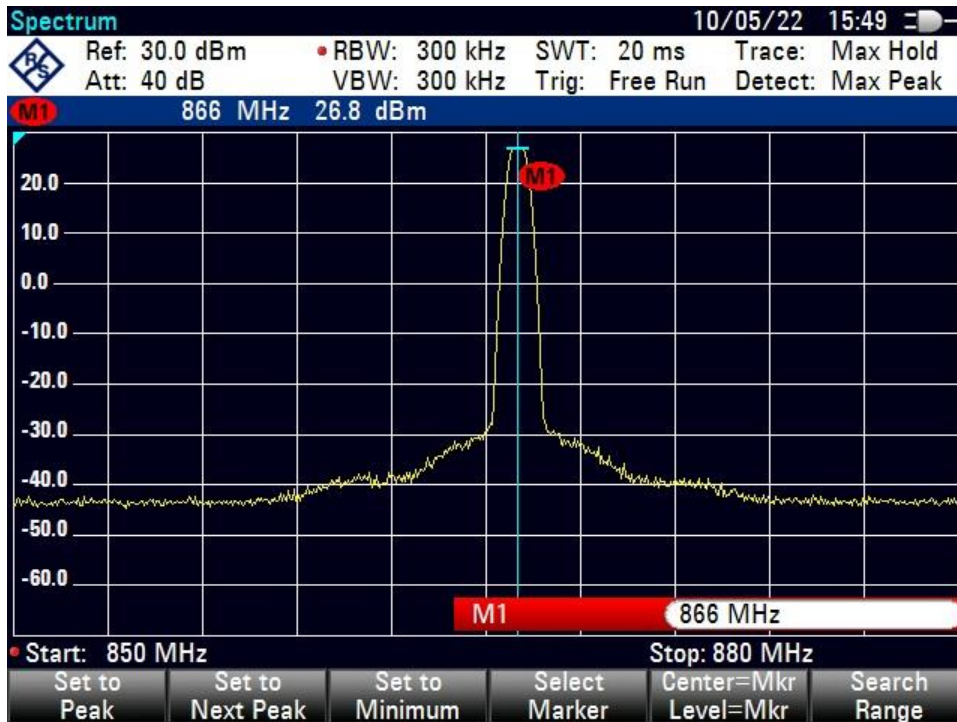
EUT antenna port connected to RF connector.

4.1 Max Conducted RF Power

Observation Table: - Test Frequency (866.000 MHz)

Channel Frequency (MHz)	Conducted Power Measured (dBm) (A)	Cable Loss (dB) (B)	Max Conducted Power (dBm) (A+B)	EIRP Test Status
866.000	26.8	0.2	27	Pass

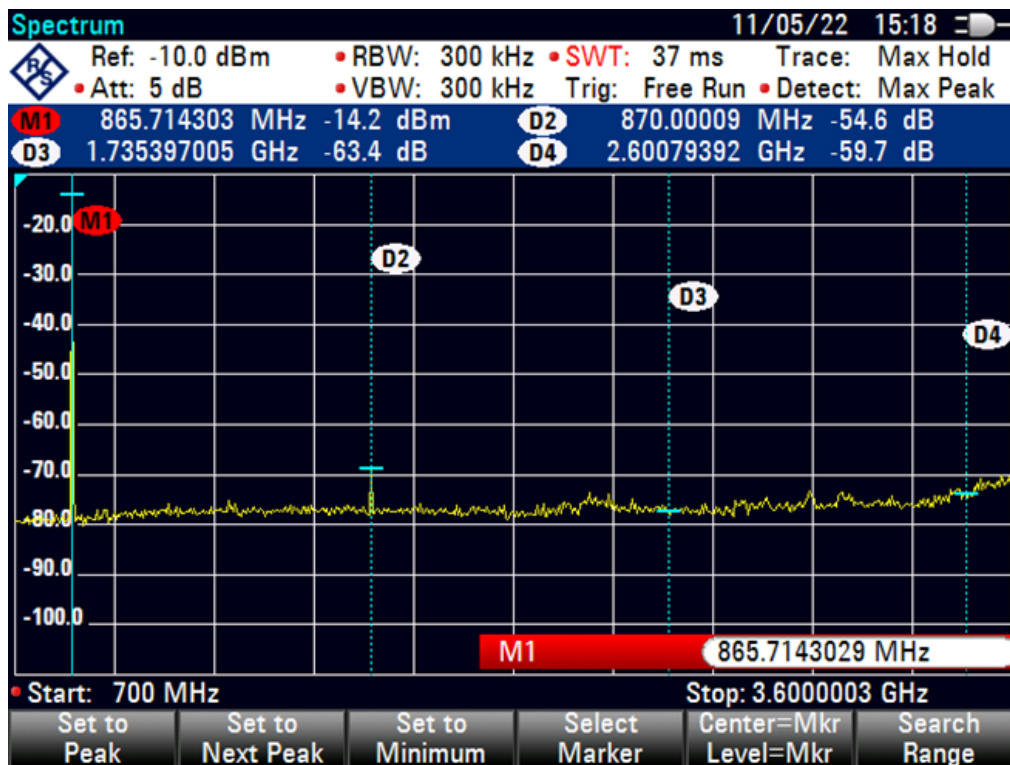
Observation Graph: - Test Frequency (866.000 MHz)



4.2 Unwanted emissions in the spurious domain for Tx mode

Observation Graph:-

Unwanted emission in the spurious domain

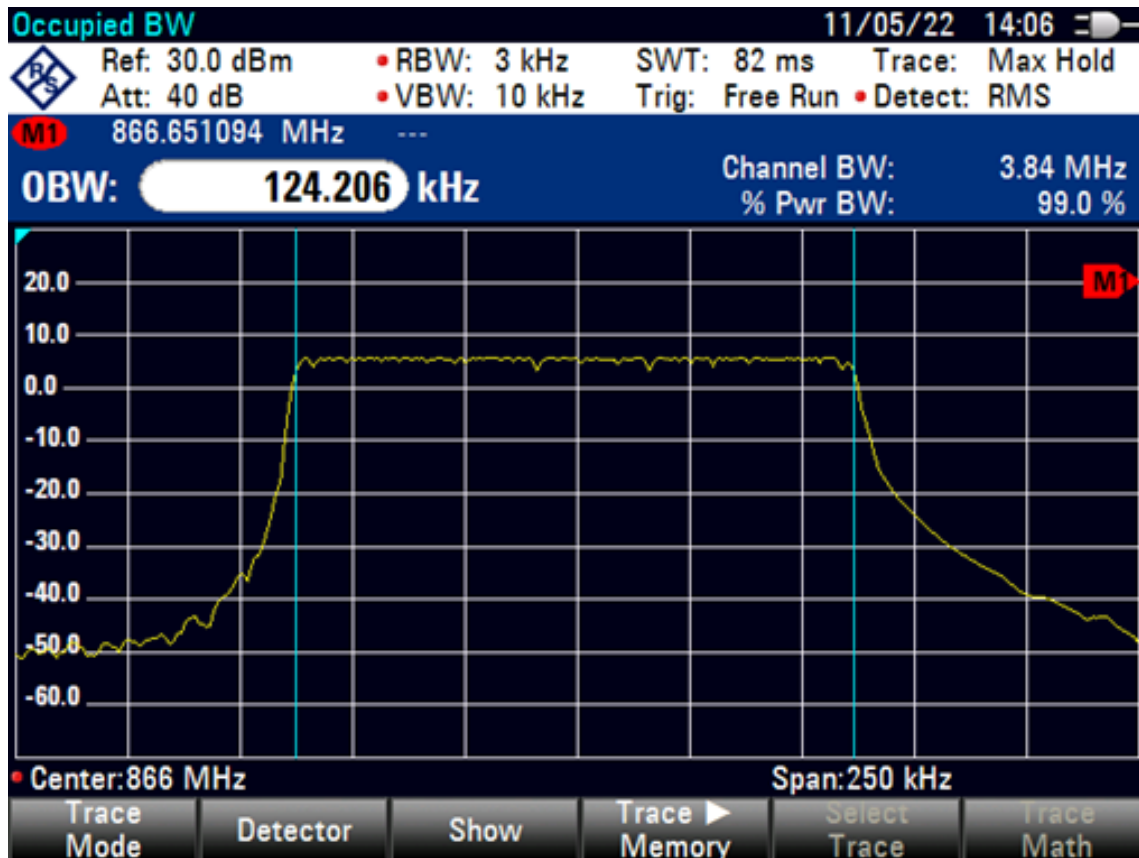




Observation Table:

Sr. No.	Frequency (MHz)	Level Measured (A) (dBm)	Correction Factors (B) (dB)	Fix Attenuation (C) (dB)	Standard Limit (dBm)	Spurious level Including correction factors: A+B+C (dBm)	Result
1	2fc	-68.8	-4.51	40	-30	-33.31	Pass
2	3fc	-76.6	-9.3	40	-30	-45.9	Pass
3	4fc	-74	-0.9	40	-30	-34.9	Pass

4.3 Occupied Bandwidth



Test Frequency (MHz)	Occupied bandwidth Measured (KHz)	Standard Limit (KHz)	Result
866.0651094	124.206	< 200	Pass

5. Software & Stacks

5.1 LoRaWAN® Gateway Stack

PicoLINKGTW-IDV1 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 host Microprocessor to run and process packets in light Embedded C environment.

The Stack also have the intelligence to switch network between 4G LTE /Wi-Fi 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 a major advantage over many DIY or non-commercial LoRaWAN® Gateway available in the market.

5.2 User Interface (UI)

PicoLINKGTW-IDV1 UI is quite simple and easy to use. A user can access the UI by connecting Ethernet on their computer. It is available thru hostname which is provided with the gateway packaging list.

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.



6. Important Notice

6.1 Disclaimer

SSTPL points out that all information in this document is given on an “as is” basis. No guarantee, neither explicit nor implicit is given for the correctness at the time of publication. SSTPL reserves all rights to make corrections, modifications, enhancements, and other changes to its products and services at any time and to discontinue any product or service without prior notice. It is recommended for customers to refer to the latest relevant information before placing orders and to verify that such information is current and complete. All products are sold and delivered subject to “General Terms and Conditions” of SSTPL, supplied at the time of order acknowledgment.

SSTPL assumes no liability for the use of its products and does not grant any licenses for its patent rights or for any other of its intellectual property rights or third-party rights. It is the customer’s duty to bear responsibility for compliance of systems or units in which products from SSTPL are integrated with applicable legal regulations. Customers should provide adequate design and operating safeguards to minimize the risks associated with customer products and applications. The products are not approved for use in life supporting systems or other systems whose malfunction could result in personal injury to the user. Customers using the products within such applications do so at their own risk.

Any reproduction of information in datasheets of SSTPL is permissible only if reproduction is without alteration and is accompanied by all given associated warranties, conditions, limitations, and notices. Any resale of SSTPL products or services with statements different from or beyond the parameters stated by SSTPL for that product/solution or service is not allowed and voids all express and any implied warranties. The limitations on liability in favour of SSTPL shall also affect its employees, executive personnel, and bodies in the same way. SSTPL is not responsible or liable for any such wrong statements.

Copyright © 2023, SSTPL

6.2 Contact Information

Sehaj Synergy Technologies Pvt. Ltd. (SSTPL)

Indu Bhawan, J-9/J-7/3, Bhagwan Marg, Swage Farm,
New Sanganer Road, Sodala, Jaipur-302019, Rajasthan, India

M: +91 8890200333 / 8890100333 E: marketing@sstpl.net.in Web: www.sstpl.in

6.3 Revision History:

V1.0

1. Frist Version
2. V1.01, correction in Power Consumption