NanoLINK Series Single Channel LoRa® Gateway

NanoLINKGTW-LRV2

Datasheet

Document Version: SSTPL/HW/GTWDS/nLNKHUBLRV2/1.0

1. Introduction

NanoLNKGTW-LRV2 is a compact, low cost, low power wide area network (LPWAN) wireless gateway that supports the Semtech LoRa® long range wireless protocol. It is a cost-effective alternative to costlier LoRaWAN® Gateway. The NanoLNKGTW-LRV2 use single channel LoRa to minimize the deployment cost for a private P2P LoRa wireless network. It can be used for small indoor/outdoor private LoRa® Network for upto 10 End Nodes which are sending data in very few times in a day.

This new Single-channel LoRa® Gateway comes in ABS material enclosure and houses SSTPL own high performance RF design. This Hub creates private LoRa® Network on the go with minimum cost.

1.1 Features

➢ Managed by Web GUI over Wi-Fi

➢ Integrated with 4G LTE backhaul for outdoor use.

➢ LoRa® Customized Stack Inside for improved RF Performance

➢ Also available Wi-Fi and Ethernet for indoor use cases.

➢ Range up to 2 km (Line of Sight)

➢ Ambient operating Temperature -20 to 75 °C

➢ IP68 Ingress Protection

➢ Built-in MQTT Client to connect over MQTT

1.2 Application

Typical applications for this Hub include society metering, small IoT projects, M2M and internet of things (IoT) edge nodes.

The module's applications are as following -

➢ Automated Meters Reading for Society & Buildings

➢ Home and Building Automation

➢ Sensor Hub applications

➢ Industrial Monitoring and Control

➢ Private network for Automated Irrigation Systems

2. Overview

NanoLNKGTW-LRV2 is a long range, high-performance, Single Channel LoRa® Gateway for wireless communication. It operates in the license free 865-867 MHz ISM frequency band and includes Semtech LoRa® Transceiver, Wi-Fi SoC with dedicated Spread Factor and channel. This creates an affordable yet quite reliable Single-channel LoRa® Mini Gateway like solution.

It has Single uplink & downlink frequency channels. It is recommended to use in small IoT deployments where only 10 (max.) LoRa Nodes are installed in non-critical operations. It is integrated with 4G LTE module which communicate with central server over 4G Internet.

This Single Channel Gateway allow only those devices to communicate with end app server which has been registered locally on the Gateway. This ensures security of end app server as well as end nodes.

Below is the block diagram of the product:
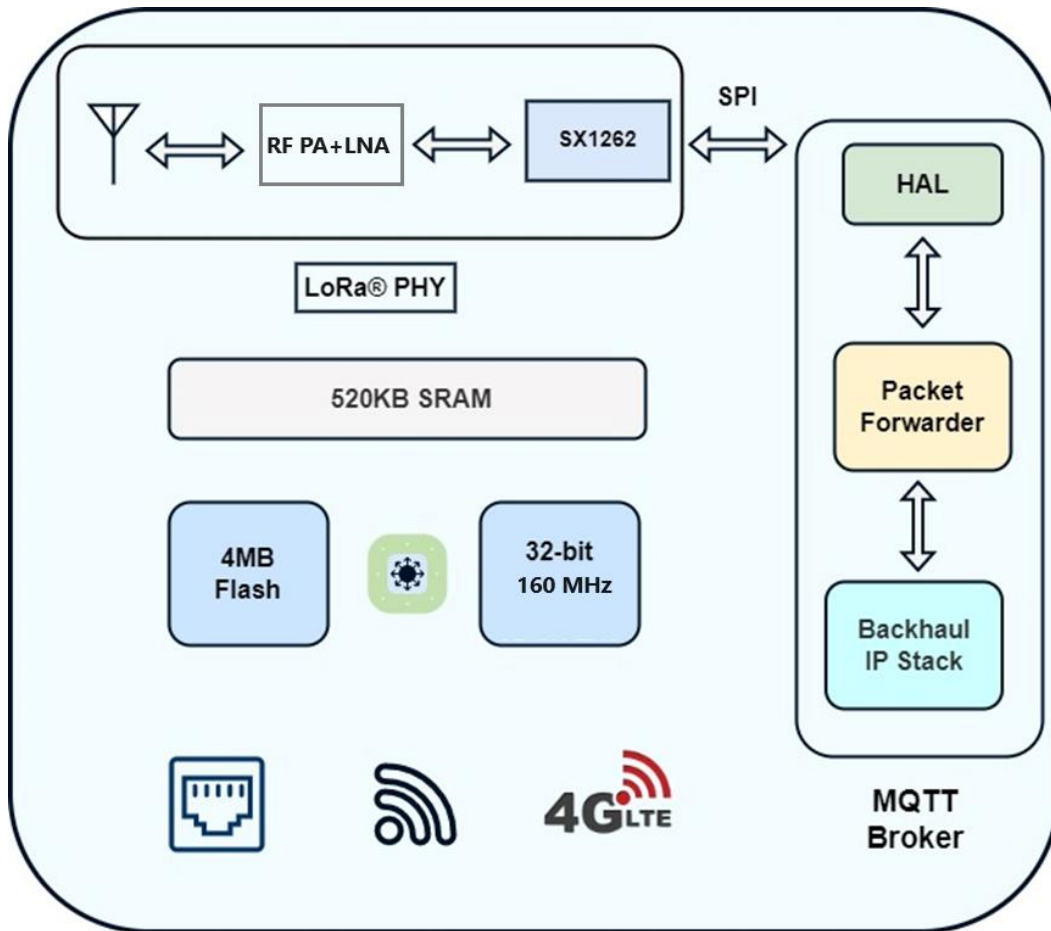
NanoLNKGTW-LRV2 comprises 3 major parts on hardware side:

1. LoRaWAN® Gateway RF Board with Power Supply Section and antennas.

2. Host MCU with Memory & RAM.

3. Connectivity Options of Fast Ethernet & 4G LTE with limited Wi-Fi access.

NanoLNKGTW-LRV2 is a commercial class device and qualifies major requirements of a small IoT Gateway. LoRa® 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. NanoLNKGTW-LRV2 has default supply option of 12V DC 1A.

3. Hardware Specification

Specs Group	Key Item	Detailed Specs
System Specification	Core	Single-core 32-Bit
	Clock Frequency	160 MHz
	RAM	520 KB SRAM
	On Board Memory	4 MB Flash
LoRaWAN®	Baseband	SX1262
	RF Front End	High Gain PA + Low Noise LNA
	Max RF Transmit Power	Up to +27 dBm
	Receiver Sensitivity	Down up to -130 dBm on SF12 & 125KHz Channel BW
	SNR Sensitivity	up to -20 dBm
	Frequency	865-867 MHz (ISM Band India)
	No. of Channels	Single Channels, 125 KHz per Channel
	Spread Factor	SF7-SF12 (Any One, SF12 default)
	Data Rate	250 - 5470 bits/sec
	LoRa Antenna Port	Inbuilt Enclosure Mounted Antenna
Internet Backhaul	Wired	Ethernet 10/100 Mbps
	Wi-Fi	Limited Coverage
	Cellular	4G LTE
	Cellular Antenna Port	Not Available (Internal Antenna Used)
Power Supply	Default	12V DC / 1A
	Optional	N/A
	Power Consumption	2.5W Typical, MAX 3W
Enclosure	Ingress Protection Level	IP68
	Dimensions	115*125*55mm
	Weight	TBD
	Mounting Option	Pole Mount / Wall Mount
Environmental	Operating Temperature	-20°C to +70°C
	Relative	-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		26.2	26.5	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 125 KHz Channel, Transmission single channel 1 minute.

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

Voltage: - 12V DC

EUT antenna port connected to RF connector.

4.1 Max Conducted RF Power

Observation Table: -

Test Frequency = 866.5500MHz

Channel Frequency (MHz)	Conducted Power Measured (dBm) (A)	Cable Loss (dB) (B)	Max Conducted Power (dBm) (A+B)	EIRP Test Status
866.5500	26.5	0.2	26.7	Pass

5. Software & Stacks

5.1 NanoLNKGTW-LRV2 Stack

NanoLNKGTW-LRV2 has customised LoRa® stack in which it communicates with the remote LoRa® End Nodes running on customized LoRa® stack with limited frequency channels. It sends acknowledgements to end nodes from the Gateway itself and updates the LoRa® End Node status on central server. Gateway communicates with End App Server over simple MQTT protocol over TCP connection. With the simple configuration of MQTT, End App Server can reach any LoRa® End Node at any time and real time low cost 2-way communication can take place.

Note: Only SSTPL make LoRa® Node with customised SSTPL firmware can work with this NanoLNKGTW-LRV2, hence customer shall order the customised nodes as well. NanoLNKGTW-LRV2 does not support OTA activation.

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.

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

Revision History:

1. V1.0, First Release