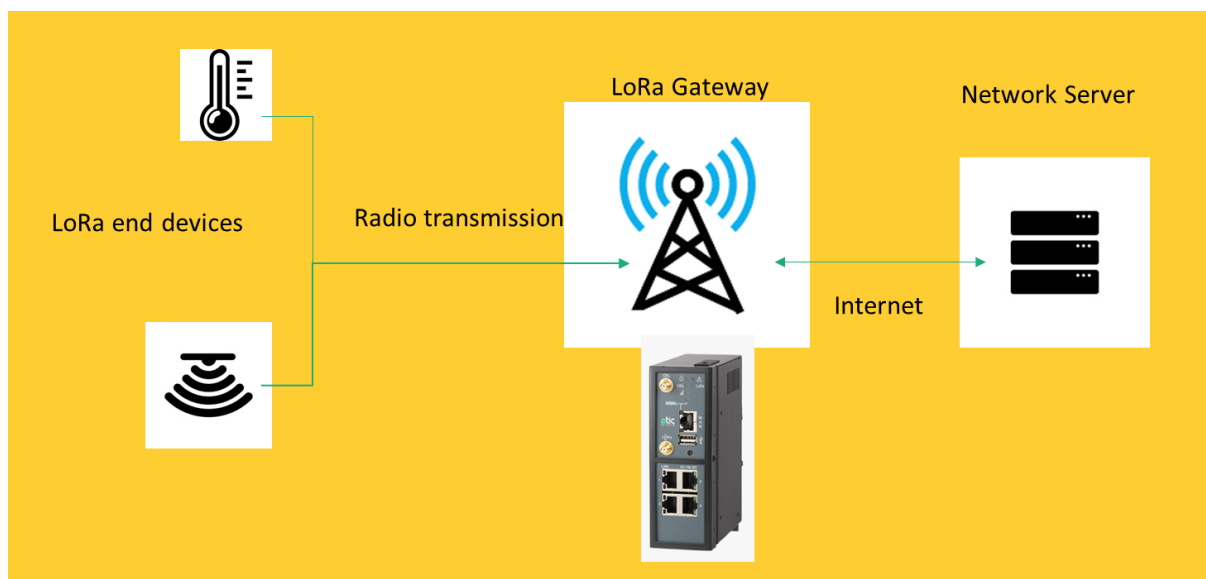


# Application note

## Starting with LoRa Gateway

- LoRaWAN network
- The LoRa Etic TELECOM gateway
- Gateway configuration
- Diagnosis
- Hot line support during your test
- Virtual Showroom

Last update **10/06/2021**



# 1) lorawan network

## **LoRaWAN technology**

LoRaWAN is a radio telecommunication protocol allowing low speed two-way communication of connected objects.

The radio signal is emitted over a large spectral width, to minimize the risk of interference with parasitic signals. This communication protocol allows data to be sent indoors (indoor), underground (deep indoor) and outdoors (outdoor).

## **Lora gateway**

Devices using LoRa technology are connected to the Internet through gateways. When a frame is received, it transmits its content over the Internet to the Network Server which has been configured in the gateway beforehand. It therefore acts as a gateway between Lora modulation and IP communication.

LoRa modulation is dedicated to the transmission of short messages, at low frequencies (in France 868 MHz) and over long distances. In free space (without obstacles), this range can reach several kilometers.

In an industrial environment, electromagnetic interference can reduce the range to a few hundred meters.

## **Network Server**

**Network Server** receives the messages transmitted by the LoRa gateway and removes the duplicates. The information transmitted to the Network Server from the LoRa Devices is authenticated using a 128-bit AES key.

## **Application Server**

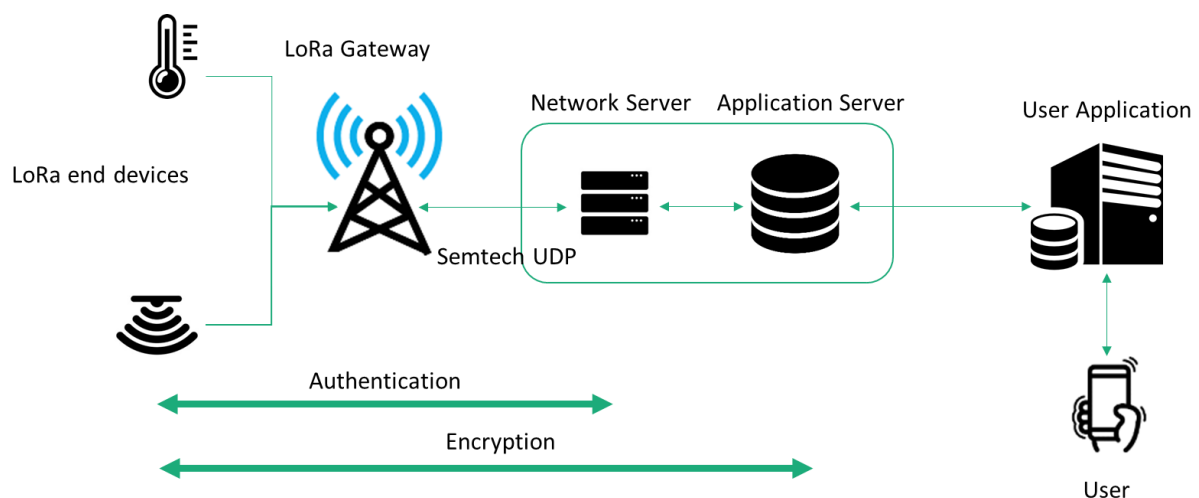
**Application Server** allows you to separate applications from each other. Each application registers LoRa Devices which will have the right to store their data. Messages sent to the application server are encrypted using a 128-bit AES key.

## 2) The LoRa Etic TELECOM gateway

The RAS-EC-480-LE is the first LoRa gateway (Gateway: Cf; diagram below) marketed by Etic Telecom. **This 1st generation Gateway does not integrate Network Server and Application Server functions.**

Etic Telecom's LoRa gateway exchanges with the LoRa Server using the Semtech UDP protocol. This protocol was designed by the manufacturer of the LoRa chipset. It is compatible with the majority of LoRa Network Servers available on the market (TTN, LorIoT,...).

The RAS-EC-480-LE connects to the Internet via 4G or via an Ethernet link. Like all RAS boxes, it is compatible with the [M2Me solution](#) and the [Collect & Alert](#) and [EticDISPLAY](#) options.



## 3) Gateway configuration.

To configure the Gateway:

- Choose the menu **Setup > Gateways > Lora Gateway**
- Check the Activate box.

### Server address:

The address of the server to which the data will be transmitted.

### Upstream port:

Port for sending upstream packets to the Lora server.

### Downstream port:

Port for receiving downstream packets from the Lora server.

### Region:

The LoRa protocol uses radio modulation on a different frequency band depending on the geographic region (868MHz in Europe).

### Keepalive interval:

Interval for sending ping requests to the Lora server.

### Stat interval:

Interval for sending statistical messages to the Lora server.

## CRC:

Frames received without CRC (cyclic redundancy check) or with an errored CRC will not be transmitted to the server.

Enable	<input checked="" type="checkbox"/>
Packet forwarder mechanism	Semtech UDP Packet Forwarder
LoRa Server address	router.eu.thethings.network
Upstream port	1700 (0 to 10000, step 1)
Downstream port	1700 (0 to 10000, step 1)
Region	EU 863-870
Keepalive interval (s)	10 (0 to 500, step 1)
Stat interval (s)	30 (0 to 500, step 1)
Forward CRC enabled	<input checked="" type="checkbox"/>

## 4) DIAGNOSIS

To check the status of the LoRa gateway, select the "Diagnostic" menu then "LoRa".

This page displays the current status of the LoRa gateway, configuration details, and a trace of the frames exchanged.

```
LoRa gateway state ON
LoRa gateway ID FFFF000AB4000000

LoRa Packet Forwarder logs
Jun 15 10:56:40 site lora_pkt_fwd: INFO: host/sx1301 time offset=(1623747374s:440850µs) - drift=237µs
Jun 15 10:56:37 site lora_pkt_fwd: JSON up: {"rxpk":[{"tmst":22633683,"chan":4,"rfch":0,"freq":867.300000,"stat":...
Jun 15 10:56:37 site lora_pkt_fwd: INFO: Received pkt from mote: 26015464 (font=12374)
Jun 15 10:56:30 site lora_pkt_fwd: INFO: host/sx1301 time offset=(1623747374s:440613µs) - drift=628449445µs
Jun 15 10:56:30 site lora_pkt_fwd: INFO: [main] concentrator started, packet can now be received
Jun 15 10:56:24 site lora_pkt_fwd: INFO: packets received with no CRC will NOT be forwarded
Jun 15 10:56:24 site lora_pkt_fwd: INFO: packets received with a CRC error will NOT be forwarded
Jun 15 10:56:24 site lora_pkt_fwd: INFO: packets received with a valid CRC will be forwarded
Jun 15 10:56:24 site lora_pkt_fwd: INFO: upstream PUSH_DATA time-out is configured to 100 ms
Jun 15 10:56:24 site lora_pkt_fwd: INFO: statistics display interval is configured to 30 seconds
Jun 15 10:56:24 site lora_pkt_fwd: INFO: downstream keep-alive interval is configured to 10 seconds
Jun 15 10:56:24 site lora_pkt_fwd: INFO: downstream port is configured to "1700"
Jun 15 10:56:24 site lora_pkt_fwd: INFO: upstream port is configured to "1700"
Jun 15 10:56:24 site lora_pkt_fwd: INFO: server hostname or IP address is configured to "127.0.0.1"
Jun 15 10:56:24 site lora_pkt_fwd: INFO: gateway MAC address is configured to FFFF000AB4000000
Jun 15 10:56:24 site lora_pkt_fwd: INFO: /tmp/lora//global_conf.json does contain a JSON object named gateway_conf
Jun 15 10:56:24 site lora_pkt_fwd: INFO: FSK channel> radio 1, IF 300000 Hz, 125000 Hz bw, 50000 bps datarate
Jun 15 10:56:24 site lora_pkt_fwd: INFO: Lora std channel> radio 1, IF -200000 Hz, 250000 Hz bw, SF 7
Jun 15 10:56:24 site lora_pkt_fwd: INFO: Lora multi-SF channel 7> radio 0, IF 400000 Hz, 125 kHz bw, SF 7 to 12
Jun 15 10:56:24 site lora_pkt_fwd: INFO: Lora multi-SF channel 6> radio 0, IF 200000 Hz, 125 kHz bw, SF 7 to 12
Jun 15 10:56:24 site lora_pkt_fwd: INFO: Lora multi-SF channel 5> radio 0, IF 0 Hz, 125 kHz bw, SF 7 to 12
Jun 15 10:56:24 site lora_pkt_fwd: INFO: Lora multi-SF channel 4> radio 0, IF -200000 Hz, 125 kHz bw, SF 7 to 12
Jun 15 10:56:24 site lora_pkt_fwd: INFO: Lora multi-SF channel 3> radio 0, IF -400000 Hz, 125 kHz bw, SF 7 to 12
Jun 15 10:56:24 site lora_pkt_fwd: INFO: Lora multi-SF channel 2> radio 1, IF 0 Hz, 125 kHz bw, SF 7 to 12
Jun 15 10:56:24 site lora_pkt_fwd: INFO: Lora multi-SF channel 1> radio 1, IF -200000 Hz, 125 kHz bw, SF 7 to 12
Jun 15 10:56:24 site lora_pkt_fwd: INFO: Lora multi-SF channel 0> radio 1, IF -400000 Hz, 125 kHz bw, SF 7 to 12
Jun 15 10:56:24 site lora_pkt_fwd: INFO: radio 1 enabled (type SX1257), center frequency 868500000, RSSI offset -14
Jun 15 10:56:24 site lora_pkt_fwd: INFO: radio 0 enabled (type SX1257), center frequency 867500000, RSSI offset -14
Jun 15 10:56:24 site lora_pkt_fwd: INFO: antenna_gain 0 dBi
Jun 15 10:56:24 site lora_pkt_fwd: INFO: lorawan_public 1, clksrc 1, lbt_enable 1, spectral_scan_enable 0
Jun 15 10:56:24 site lora_pkt_fwd: INFO: /tmp/lora//global_conf.json does contain a JSON object named sx1301_conf
Jun 15 10:56:24 site lora_pkt_fwd: INFO: found global configuration file /tmp/lora//global_conf.json, parsing it
Jun 15 10:56:24 site lora_pkt_fwd: INFO: Little endian host
```

## 5) HOT LINE SUPPORT DURING YOUR TEST

Feel free to contact +33 4 76 04 20 05 or [hotline@etictelecom.com](mailto:hotline@etictelecom.com).

## 6) VIRTUAL SHOWROOM (available from the home page)

By surfing on our WEB site [www.etictelecom.com](http://www.etictelecom.com) (Support/Virtual Showroom) you can learn how to configure a Machine Access Box (namely a RAS product).

