

# Gateway LoRa LORIX One

In this document will be all the steps required to set up and configure this gateway in order to successfully communicate with The Things Network you should always read the user manual ([https://www.lorixone.io/wiki/Main\\_Page](https://www.lorixone.io/wiki/Main_Page)).

## 1. Unboxing

In the box you should have one gateway, one antenna, one PoE adapter, one power source and one set of zip ties



Figure 1 LORIX One box



Figure 2 The Gateway



Figure 3 Gateway and Antenna



Figure 4 PoE adapter

## 2. Mounting

For this step you need an extra Ethernet cable.



Figure 5 Mounting Antenna



Figure 6 Connections



Figure 7 Final Result for Tests



Figure 8 Final Result for deployment

### 3. Configuration

#### CONNECTIVITY/INTERFACE

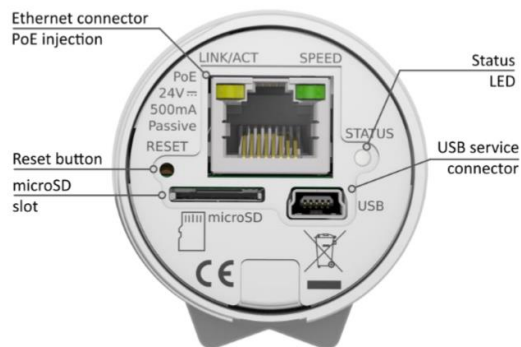


Figure 9 Connectivity/Interface

For the configuration part you can choose from connect directly from USB, and for this use you need to set the baud rate to 115200, Data bits to 8, Stop bits 1, Parity and Flow Control None, you should also check in the wiki for lorix programming tool.

I used the SSH option if you are using windows, download PuTTY, (the default ip is 192.168.1.50), our gateway is in the 192. 168.1.250 on port 22.

The credentials need will be given in a separate file.

Ok now you should see something like this:

```

192.168.1.50 - PuTTY
login as: admin
admin@192.168.1.50's password:
Last login: Sun Sep  2 13:27:18 2018 from 192.168.1.69

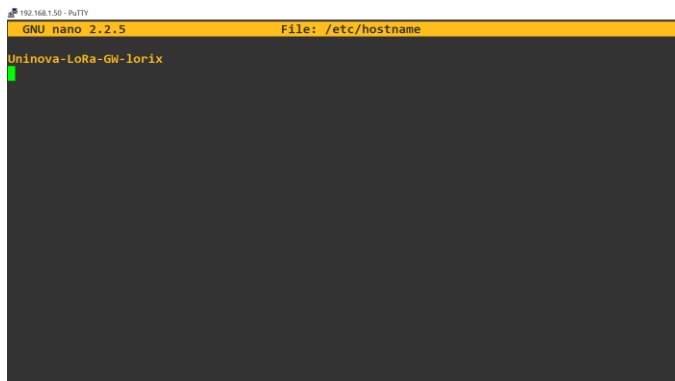
LORIX One

-----
LoRa gateway  www.lorixone.io
Wiki           www.lorixone.io/wiki
Quick start   www.lorixone.io/wiki/quickstart
Troubleshooting www.lorixone.io/wiki/troubleshooting
Changelog     www.lorixone.io/wiki/changelog
Versions      www.lorixone.io/wiki/versions
-----

sama5d4-lorix-one-512:~$
```

Figure 10 LORIX Home

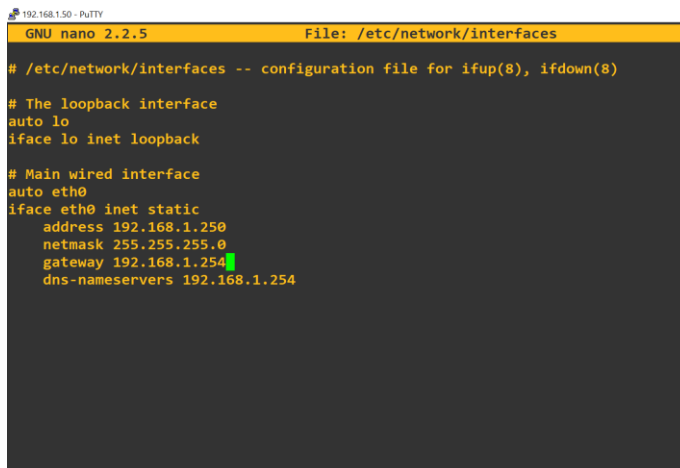
Now lets change the hostname just type: `sudo nano /etc/hostname`



```
GNU nano 2.2.5 File: /etc/hostname
Uninova-LoRa-GW-lorix
```

Figure 11 Change Hostname

Select the right network configurations : `sudo nano /etc/network/interfaces`



```
GNU nano 2.2.5 File: /etc/network/interfaces

# /etc/network/interfaces -- configuration file for ifup(8), ifdown(8)

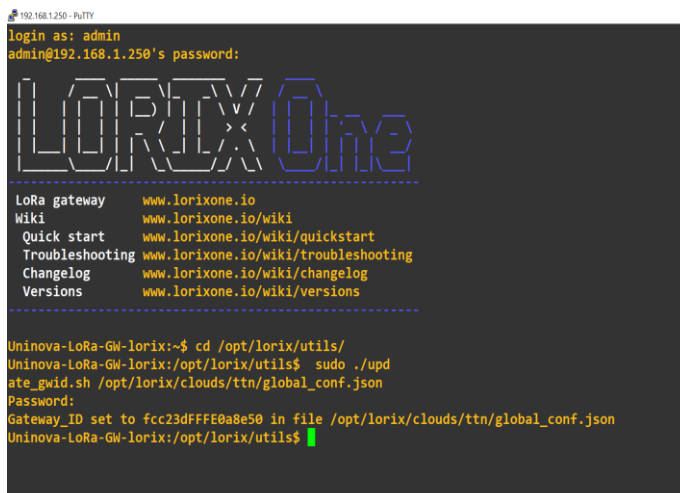
# The loopback interface
auto lo
iface lo inet loopback

# Main wired interface
auto eth0
iface eth0 inet static
    address 192.168.1.250
    netmask 255.255.255.0
    gateway 192.168.1.254
    dns-nameservers 192.168.1.254
```

Figure 12 Change network/interfaces

This gateway is configured to connect to TTN so you need to update the gateway ID:

`cd /opt/lorix/utils/`  
`sudo ./update_gwid.sh /opt/lorix/clouds/ttn/global_conf.json`



```
192.168.1.250 - PuTTY
login as: admin
admin@192.168.1.250's password:

LorixOne

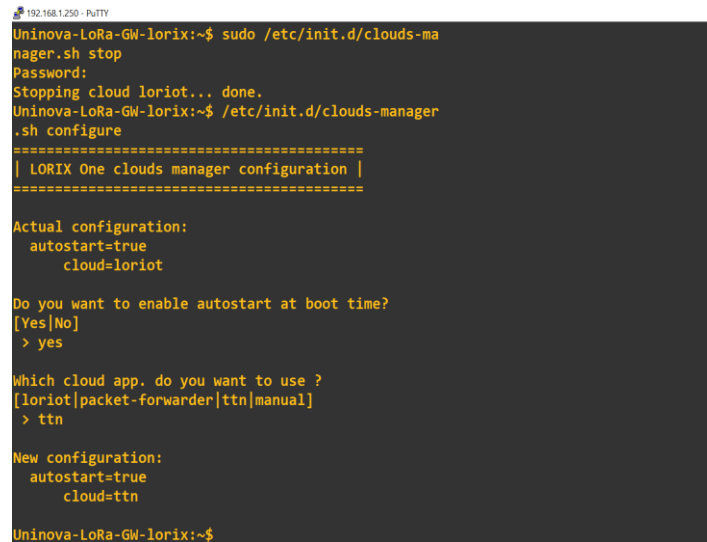
-----
LoRa gateway  www.lorixone.io
Wiki          www.lorixone.io/wiki
Quick start   www.lorixone.io/wiki/quickstart
Troubleshooting www.lorixone.io/wiki/troubleshooting
Changelog     www.lorixone.io/wiki/changelog
Versions      www.lorixone.io/wiki/versions
-----

Uninova-LoRa-GW-lorix:~$ cd /opt/lorix/utils/
Uninova-LoRa-GW-lorix:/opt/lorix/utils$ sudo ./update_gwid.sh /opt/lorix/clouds/ttn/global_conf.json
Password:
Gateway_ID set to fcc23dFFE0a8e50 in file /opt/lorix/clouds/ttn/global_conf.json
Uninova-LoRa-GW-lorix:/opt/lorix/utils$
```

Figure 13 Update Gateway ID

By default the Gateway is working with loriot, you need to change it for TTN:

```
/etc/init.d/clouds-manager.sh stop  
  
/etc/init.d/clouds-manager.sh configure
```



```
Uninova-LoRa-GW-lorix:~$ sudo /etc/init.d/clouds-manager.sh stop  
Password:  
Stopping cloud loriot... done.  
Uninova-LoRa-GW-lorix:~$ /etc/init.d/clouds-manager.sh configure  
===== | LORIX One clouds manager configuration | =====  
  
Actual configuration:  
  autostart=true  
  cloud=loriot  
  
Do you want to enable autostart at boot time?  
[Yes|No]  
> yes  
  
Which cloud app. do you want to use ?  
[loriot|packet-forwarder|ttn>manual]  
> ttn  
  
New configuration:  
  autostart=true  
  cloud=ttn  
  
Uninova-LoRa-GW-lorix:~$
```

Figure 14 Update Gateway for TTN

Update the local\_conf.json

```
cd /opt/lorix/clouds/ttn/  
nano cp local_conf.json
```



```
GNU nano 2.2.5      File: local_conf.json  
  
/* Put there parameters that are different for each gateway (eg. pointing one gateway to a test server w$  
/* Settings defined in global_conf will be overwritten by those in local_conf */  
"gateway_conf": {  
  "gateway_ID": "fcc23dffffe0a8e50",  
  
  "servers": [  
    {  
      "server_address": "router.eu.thethings.network",  
      "serv_port_up": 1700,  
      "serv_port_down": 1700,  
      "serv_enabled": true  
    }  
  ],  
  "fake_gps": false,  
  "ref_latitude": 10,  
  "ref_longitude": 20,  
  "ref_altitude": 120,  
  "contact_email": "jsc@uninova.pt",  
  "description": "Uninova Wifx LORIX One gateway"  
}  
}
```

Figure 15 Update local\_conf.json

This step is quiet important because every time you do the command “opkg upgrade” it will be reset to the default value

```
Uninova-LoRa-GW-lorix:/opt/lorix/clouds/ttn$ sudo cp local_conf.json local_conf.json.bk1911  
Uninova-LoRa-GW-lorix:/opt/lorix/clouds/ttn$
```

Figure 16 Backup local\_conf.json

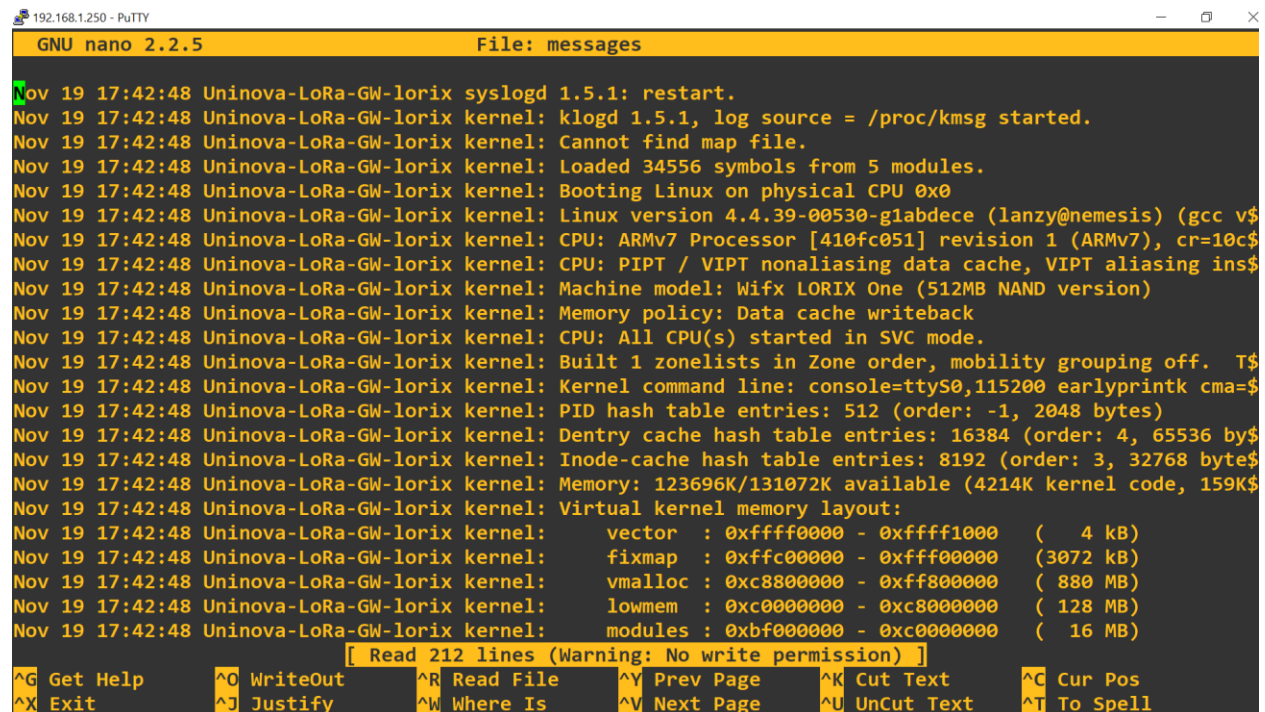
Read the log files

```
cd /var/log
nano messages
```

192.168.1.250 - PuTTY

```
Uninova-LoRa-GW-lorix:/var/log$ nano messages
Uninova-LoRa-GW-lorix:/var/log$
```

Figure 17 Read log file



```
GNU nano 2.2.5 File: messages
Nov 19 17:42:48 Uninova-LoRa-GW-lorix syslogd 1.5.1: restart.
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: klogd 1.5.1, log source = /proc/kmsg started.
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: Cannot find map file.
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: Loaded 34556 symbols from 5 modules.
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: Booting Linux on physical CPU 0x0
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: Linux version 4.4.39-00530-g1abdece (lanzy@nemesi) (gcc v$
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: CPU: ARMv7 Processor [410fc051] revision 1 (ARMv7), cr=10c$
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: CPU: PIPT / VIPT nonaliasing data cache, VIPT aliasing ins$
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: Machine model: Wifx LORIX One (512MB NAND version)
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: Memory policy: Data cache writeback
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: CPU: All CPU(s) started in SVC mode.
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: Built 1 zonelists in Zone order, mobility grouping off. T$
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: Kernel command line: console=ttyS0,115200 earlyprintk cma=$
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: PID hash table entries: 512 (order: -1, 2048 bytes)
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: Dentry cache hash table entries: 16384 (order: 4, 65536 by$
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: Inode-cache hash table entries: 8192 (order: 3, 32768 byte$
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: Memory: 123696K/131072K available (4214K kernel code, 159K$
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel: Virtual kernel memory layout:
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel:   vector : 0xffff0000 - 0xffff1000   ( 4 kB)
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel:   fixmap : 0xffc00000 - 0xffff0000   (3072 kB)
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel:   vmalloc : 0xc8800000 - 0xff800000   ( 880 MB)
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel:   lowmem  : 0xc0000000 - 0xc8000000   ( 128 MB)
Nov 19 17:42:48 Uninova-LoRa-GW-lorix kernel:   modules : 0xbf000000 - 0xc0000000   ( 16 MB)
[ Read 212 lines (Warning: No write permission) ]
^G Get Help      ^O WriteOut     ^R Read File    ^V Prev Page    ^K Cut Text     ^C Cur Pos
^X Exit          ^J Justify      ^W Where Is     ^N Next Page    ^U UnCut Text   ^T To Spell
```

Figure 18 Output log file

## 4. The Things Network

The last part now in the TTN console (<https://console.thethingsnetwork.org/>) choose gateways, click in register gateway, and don't forget to select "I'm using the legacy packet forwarder", put Europe in your frequency Plan and choose the location you can do this by clicking the map , put the right antenna Placement and enter Register Gateway.

In the next screen you can fill in more information such as brand, model, antenna if you are only doing some test you can put the visibility as private, by doing this your gateway will not appear in the ttn map.

If you follow all steps right now in this screen should be a green icon saying "Status Connected" !!!

**Gateway EUI**  
The EUI of the gateway as read from the LoRa module

FC C2 3D FF FE 0A BE 50 0 bytes

☒ **I'm using the legacy packet forwarder**  
Select this if you are using the legacy [Semtech packet forwarder](#).

**Description**  
A human-readable description of the gateway

Uninova LoRa GW Lorix One

**Frequency Plan**  
The [frequency plan](#) this gateway will use

Europe 868MHz

**Router**  
The router this gateway will connect to. To reduce latency, pick a router that is in a region which is close to the location of the gateway.

ttn-router-eu

Figure 19 TTN Register Gateway

**GATEWAY OVERVIEW**

Gateway ID: eu-fcc23dffe0a8e50

Description: Uninova LoRa GW Lorix One

Owner: rjorodriguez [Transfer ownership](#)

Status: connected

Frequency Plan: Europe 868MHz

Router: ttn-router-eu

Gateway Key: base64

Last Seen: 2 seconds ago

Received Messages: 57

Transmitted Messages: 1

**INFORMATION**

Brand: Lorix

Model: One

Antenna: 4.15 dBi


Figure 20 TTN Gateway Connected

**GATEWAY TRAFFIC**

uplink downlink join 0 bytes 0 bytes clear

time	frequency	mod	CR	data rate	airtime (ms)	cnt	dev addr	payload size
17:34:45	868.1	loro	4/5	SF 7 BW 125	77.1	23	26 01 19 73	34 bytes
17:34:24	868.1	loro	4/5	SF 7 BW 125	77.1	22	26 01 19 73	34 bytes
17:34:03	868.1	loro	4/5	SF 7 BW 125	77.1	21	26 01 19 73	34 bytes

Figure 21 TTN Gateway Receiving Traffic



THE THINGS


NETWORK

COMMUNITY EDITION

Applications

Gateways

Support



rjorodrigues

Applications

lora101app

Devices

node1abp

Data

	time	counter	port		
▲	17:44:50	5	2	payload: 06 92 26 76 BE 88 48 04 92 26 66 BE 88 4A 00 06 91 ECEC 30 4B	macaddress.mac_1: *06:92:26:
▲	17:44:29	4	2	payload: 04 92 26 66 BE 88 47 06 92 26 76 BE 88 47 7C 8BCA 87 64 38 4C	macaddress.mac_1: *04:92:26:
▲	17:44:08	3	2	payload: 04 92 26 66 BE 88 49 06 92 26 76 BE 88 49 00 06 91 ECEC 32 4A	macaddress.mac_1: *04:92:26:
●	17:44:08	1	confirmed ack	app id: lora101app	
▼	17:43:47	1	confirmed	payload: AA	
▲	17:43:47	2	2	payload: 04 92 26 66 BE 88 47 06 92 26 76 BE 88 47 00 06 91 ECEC 30 4B	macaddress.mac_1: *04:92:26:
▼	17:43:43	1	scheduled confirmed	payload: AA	
▼	17:43:38	1	scheduled	payload: AA	
▲	17:43:26	1	2	payload: 06 92 26 76 BE 88 45 04 92 26 66 BE 88 46 7C 8BCA 87 64 38 49	macaddress.mac_1: *06:92:26:

Figure 22 TTN Node Connected to Gateway

## 5. References

- [https://www.lorixone.io/wiki/Main\\_Page](https://www.lorixone.io/wiki/Main_Page)
- <https://www.lorixone.io/sites/default/files/2018-11/LORIX%20One%20user%20manual%20EN.pdf>
- <https://www.lorixone.io/en/products>
- <https://www.thethingsnetwork.org/labs/story/install-awesome-lorix-one-gateway>