

How to Install LORIoT Binary on UG85

Before we get started to create Lorient binary, please make sure the gateway is able to visit the Internet via WAN or cellular network and you are in possession of the following file and credentials.

- Root Access
- Gateway's Password
- A File named Lorient_ursalink_spi

Ps. You can contact Ursalink Support to acquire those information and follow this guide to complete the installation then.

NOTE:

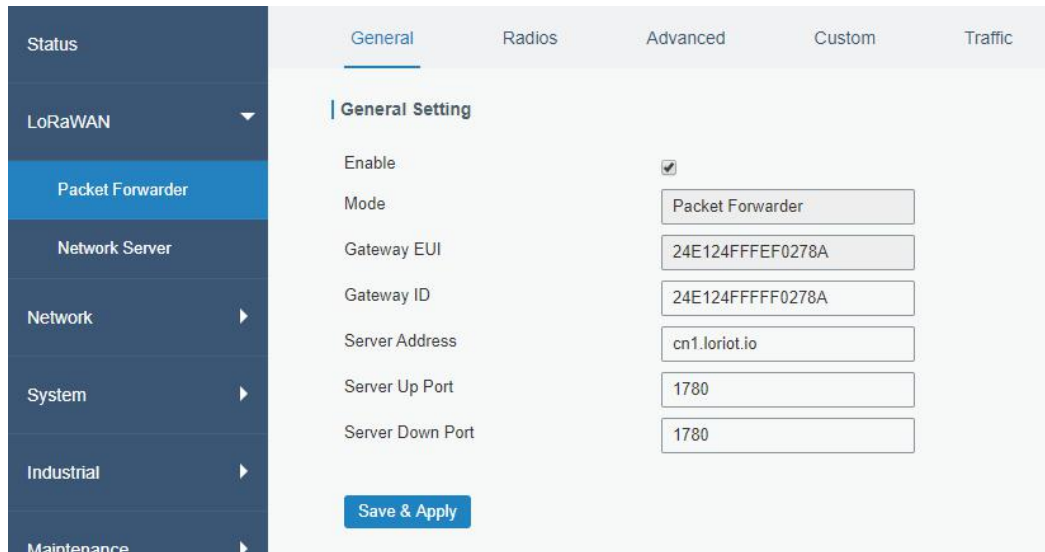
- The UG85 should be able to connect to the Internet during the installation process.
- Please make sure no other process on the gateway accesses the concentrator interface during installation. Otherwise, the binary would fail to start or only receives a subset of all the packets over the air.
- Remember to enable SSH in "System > General Settings" and leave port 22 as default.

1. UG85 Configuration

1.1 Configuring through WAN Connection

Step 1: Change Gateway ID

Log into UG85 Web GUI. Go to "LoRaWAN > Packet Forwarder" and alter "FFFE" in the middle of gateway ID into "FFFF" as follows.



Step 2: Configure LORIoT

Log in to your LORIoT account. Find “Network” and Click “Add a gateway”.

Step 3: Connect UG85 to LORIoT

Choose UG87 (same as UG85) as base platform and enter the gateway ID into MAC address with losing “FFFF”. In this case, it would be like 24:E1:24:F0:27:8A. Then Select gateway location and register. After that, you can see a green light and the gateway is successfully connected.

1.2 Configuring through Cellular Connection

Step 1: Login as Root

Open PuTTY, fill in host name or IP address and port. Login as root.

Step 2: Check Network Interface Configuration

Run command as follows and check network interface configuration. Copy HWaddr address of cellular0.

```

root@ROUTER: /mnt/mmcbk0p1/root
login as: root
root@192.168.1.1's password:

BusyBox v1.25.1 (2019-07-10 11:44:39 CST) built-in shell (ash)

root@ROUTER:/mnt/mmcbk0p1/root# ifconfig
GE0      Link encap:Ethernet  HWaddr 24:E1:24:F0:27:8A
        inet addr:192.168.1.1  Bcast:192.168.1.255  Mask:255.255.255.0
        inet6 addr: fe80::26e1:24ff:fe0:278a/64  Scope:Link
        UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
        RX packets:25246 errors:0 dropped:0 overruns:0 frame:0
        TX packets:25375 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:4387426 (4.1 MiB)  TX bytes:18120597 (17.2 MiB)

cellular0 Link encap:Ethernet  HWaddr EE:26:C7:0E:D8:29
        inet addr:10.208.67.12  Bcast:10.208.67.15  Mask:255.255.255.248
        inet6 addr: fe80::ec26:c7ff:fe0e:d829/64  Scope:Link
        UP BROADCAST RUNNING NOARP MULTICAST  MTU:1500  Metric:1
        RX packets:33706 errors:0 dropped:0 overruns:0 frame:0
        TX packets:35395 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:18227610 (17.3 MiB)  TX bytes:7656686 (7.3 MiB)

lo       Link encap:Local Loopback
        inet addr:127.0.0.1  Mask:255.0.0.0
        inet6 addr: ::1/128  Scope:Host
        UP LOOPBACK RUNNING  MTU:65536  Metric:1
        RX packets:41596 errors:0 dropped:0 overruns:0 frame:0
        TX packets:41596 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1
        RX bytes:9988430 (9.5 MiB)  TX bytes:9988430 (9.5 MiB)
    
```

Step 3: Fill in Gateway ID

Login UG85 Web GUI. Click “LoRaWAN > Packet Forwarder”. Remove colons from the HWaddr address of cellular0 and add “FFFF” in the middle. In this case, the gateway ID would be like EE26C7FFFF0ED829.

Status	General	Radios	Advanced	Custom	Traffic
LoRaWAN	General Setting				
Packet Forwarder	Enable	<input checked="" type="checkbox"/>			
Network Server	Mode	Packet Forwarder			
Network	Gateway EUI	24E124FFFEF0278A			
System	Gateway ID	EE26C7FFFF0ED829			
Industrial	Server Address	cn1.loriot.io			
Maintenance	Server Up Port	1780			
	Server Down Port	1780			
	<input type="button" value="Save & Apply"/>				

Step 4: Configure LORIOT

Log in to your LORIOT account. Find “Network” and Click “Add a gateway”.

Step 5: Connect UG85 to LORIOT

Choose UG87 as base platform and fill in MAC address that is equal to the HWaddr address. In this case, it would be like EE:26:C7:0E:D8:29. Then Select gateway location and register. After that, you can see a green light and the gateway is successfully connected.

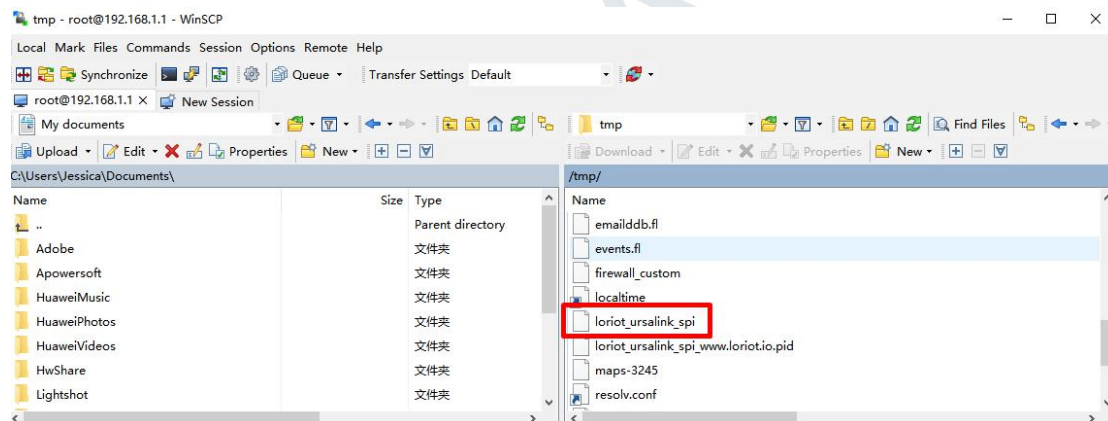
2. General Configuration

Step 1:

After the gateway is successfully connected, you can go to “LoRaWAN > Packet Forwarder” ,disable the packet forwarder mode, and make sure no other process accesses SX1301. Then click “Save & Apply”.

Step 2:

Login as root in WinSCP or use other software to upload “loriot_ursalink_spi” into “/tmp” folder.



Step 3:

Open PuTTY or use other software to login as root with entering host name or IP address and SSH port. Type in command as below and make sure “loriot_ursalink_spi” was copied to “/tmp”.

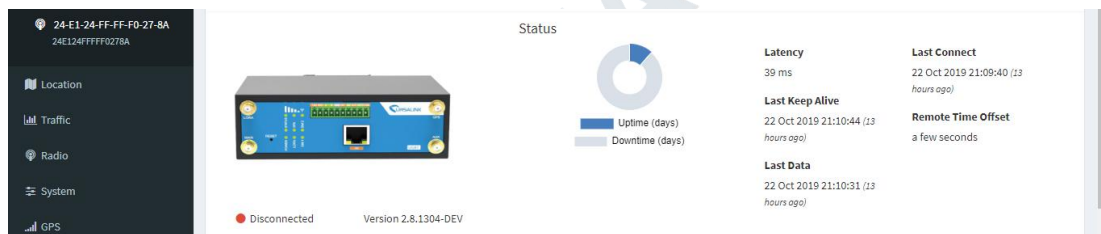
```

root@ROUTER: /tmp
login as: root
root@192.168.23.222's password:

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root@ROUTER:/mnt/mmcblk0p1/root# cd /tmp
root@ROUTER:/tmp# ls
board.json          localtime          shm
cellular0_mtu      lock              smsdb.fl
cloud_alm-x        log              spool
current_link       loriot-gw        state
db                 loriot-install.sh syscore.fl
emailddb.fl        loriot_ursalink_spi sysinfo
etc                 maps-1308         tmp
events.fl          resolv.conf       tunneled
firewall_custom    resolv.conf.auto uhttpd_weblogin
lib                run
root@ROUTER:/tmp#
    
```

As packet forwarder has stopped, you can see the gateway is disconnected to LORIIOT.



Step 4:
Run command “`chmod 777 ./loriot_ursalink_spi`”

```

root@ROUTER: /tmp
login as: root
root@192.168.1.1's password:
Access denied
root@192.168.1.1's password:

BusyBox v1.25.1 (2019-07-10 11:44:39 CST) built-in shell (ash)

root@ROUTER:/mnt/mmcblk0p1/root# cd /tmp
root@ROUTER:/tmp# chmod 777 ./loriot_ursalink_spi
root@ROUTER:/tmp#
    
```

Step 5:
Run binary command “`./loriot_ursalink_spi -f -E GEO -s cn1.loriot.io`”

```

root@ROUTER: /tmp
login as: root
root@192.168.1.1's password:
Access denied
root@192.168.1.1's password:

BusyBox v1.25.1 (2019-07-10 11:44:39 CST) built-in shell (ash)

root@ROUTER:/mnt/mmcblk0pl/root# cd /tmp
root@ROUTER:/tmp# chmod 777 ./loriot_ursalink_spi
root@ROUTER:/tmp# ./loriot_ursalink_spi -f -E GE0 -s cn1.loriot.io
[2019-10-23 15:26:12.076][LOG ] interface set
[2019-10-23 15:26:12.077][LOG ] main.c:790 Gateway loriot_u
rsalink_spi version 2.8.1304-DEV main.c:791 Openssl version
[2019-10-23 15:26:12.078][LOG ] main.c:791 Openssl version
OpenSSL 1.0.2k 26 Jan 2017
[2019-10-23 15:26:12.080][LOG ] eui.c:72 Using GE0 for GW
EUI 24E124FFFFF0278A

```

NOTE:

- If UG85 starts wireless connection over cellular rather than WAN, you can replace “GE0” with HWaddr address. In this case, please run “./loriot_ursalink_spi -f -E cellular0 -s cn1.loriot.io”.
- The server address “cn1.loriot.io” may be not exactly the same in your case. You can go to Ursalink Web GUI, find the packet forwarder, and copy the server address that you used to connect to LORIOT.

3. Testing

Run LORIOT binary in PuTTY. You can ping and find the gateway has successfully connected.

The screenshot shows the LORIOT web interface for a specific gateway (24-E1-24-FF-FF-F0-27-8A). A green notification at the top right states "Gateway 24-E1-24-FF-FF-F0-27-8A successfully pinged". The main status area shows a "Connected" indicator and a version of 2.8.1304-DEV. A donut chart displays "Uptime (days)" and "Downtime (days)". Key metrics include Latency (43 ms), Last Connect (23 Oct 2019 10:17:47), Last Keep Alive (23 Oct 2019 10:17:52), and Last Data (22 Oct 2019 21:10:31). The details section lists MAC Address (24:E1:24:F0:27:8A), EUI (24-E1-24-FF-FF-F0-27-8A), Base (Ursalink), Model (UG87), Concentrator (ursalink_ug87), and SSH Tunnel Service Server (cn1.loriot.io). The SSH Command is also visible.

-End-