

GTW361 yocto System Software

User's Guide

V1.0

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Revision History

DATA	Modification Type	Version	描述
2023/4/3	Creating Documents	1.0	

1. Overview

GTW361 is a 4G industrial-grade IoT outdoor gateway from Geniatech. It adopts industrial standard chip structure design and open system architecture, which is convenient for access and customization of third-party platforms. Support multi-protocol convergence, easy to realize industrial equipment data collection and equipment remote maintenance. Support 4G, WiFi, Ethernet and other network access. Support ZigBee, BLE, ZWave, LoRa and other mainstream IoT connections. Unique software algorithm to achieve safe and reliable network communication.

2. System burn-in

System burn-in requires removing the top cover of the case and following the steps below to perform the burn-in.

2.1 Prerequisites

- Both ends are male USB burn-in cable
- Host PC (64-bit support only)
- GTW361 Equipment
- 12V power supply



2.2 Download burn-in firmware & tools

Download the yocto system image file from the following website:

Please contact the staff

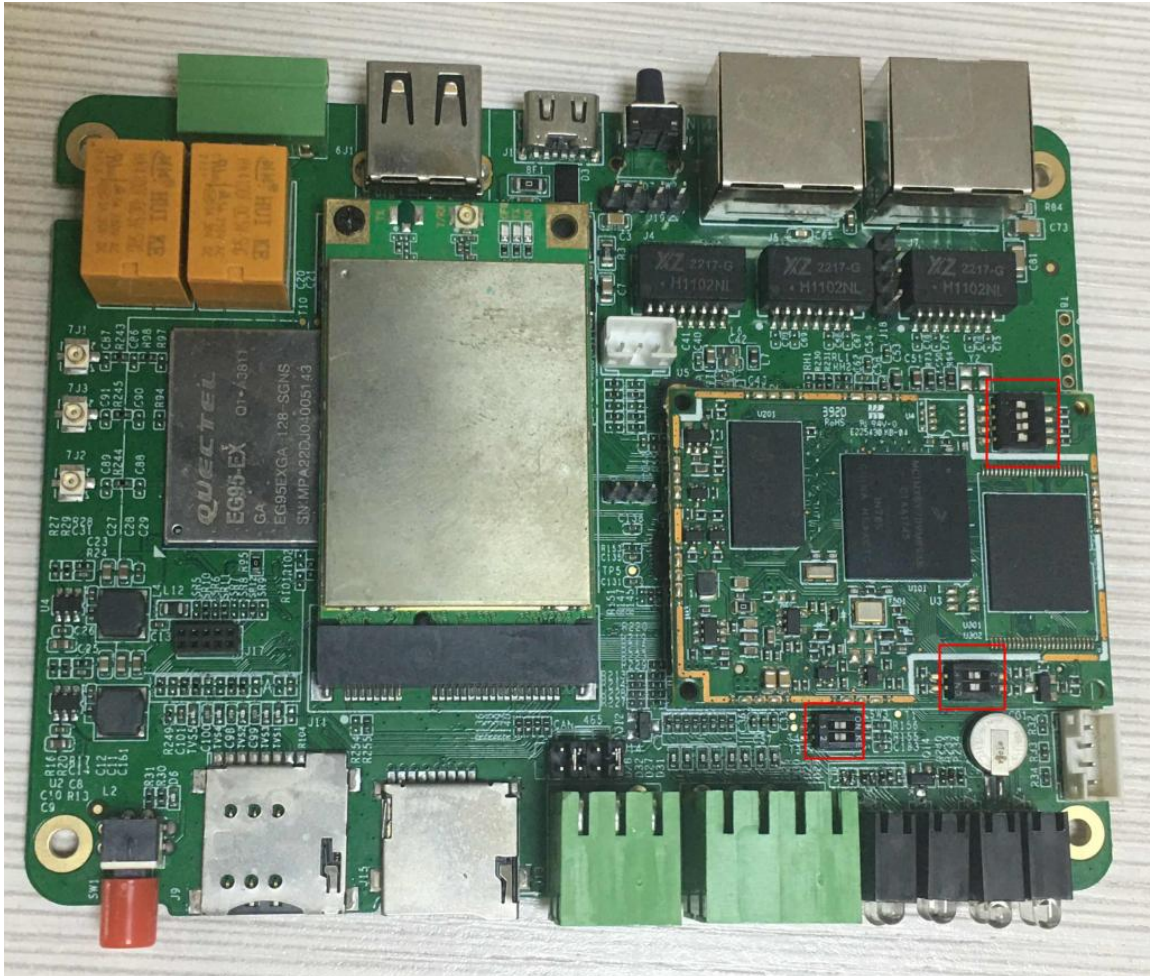
Download the Driver from below website:

<https://www.driverscape.com/download/hid-compliant-vendor-defined-device>

2.3 Switching the motherboard to burn-in mode

Set the dial switch: -Mainboard 1-OFF 2-ON; 1-OFF 2-ON 3-ON 4-OFF

Carrier board 1-OFF 2-OFF



2.4 PC identification GTW361

Connect the computer to the GTW361 with the two-pronged common USB burn-in cable, then connect the Type-c power supply. Check the device driver loaded in Device Manager.



2.5 Burning steps

Unzip imx6ull-yocto_RNU190830-gtw361_hwV1.1_20220812024956.tar.gz, go to the directory and type cmd, under the cmd status bar type `uuu uuu.auto`, enter

```
C:\> 管理员: C:\Windows\System32\cmd.exe
Microsoft Windows [版本 10.0.14393]
(c) 2016 Microsoft Corporation。保留所有权利。

D:\test\imx6ull-yocto_RNU190830-gtw361_hwV1.1_20220812024956>uuu uuu.auto_
```


2.6 Burning in

```

管理员: C:\Windows\System32\cmd.exe - uu uuu.auto
Microsoft Windows [版本 10.0.14393]
(c) 2016 Microsoft Corporation. 保留所有权利。

D:\test\imx6ull-yocto_RNU190830-gtw361_hwV1.1_20220812024956>uu uuu.auto
uu (Universal Update Utility) for nxp imx chips -- libuu_1.2.91-0-g3799f4d

Success 0    Failure 0

1:43  4/ 7  [====>    21%          ] FB: flash -raw2sparse all fs1-image-validation-imx-imx6ull14x14evk.sdcard
  
```

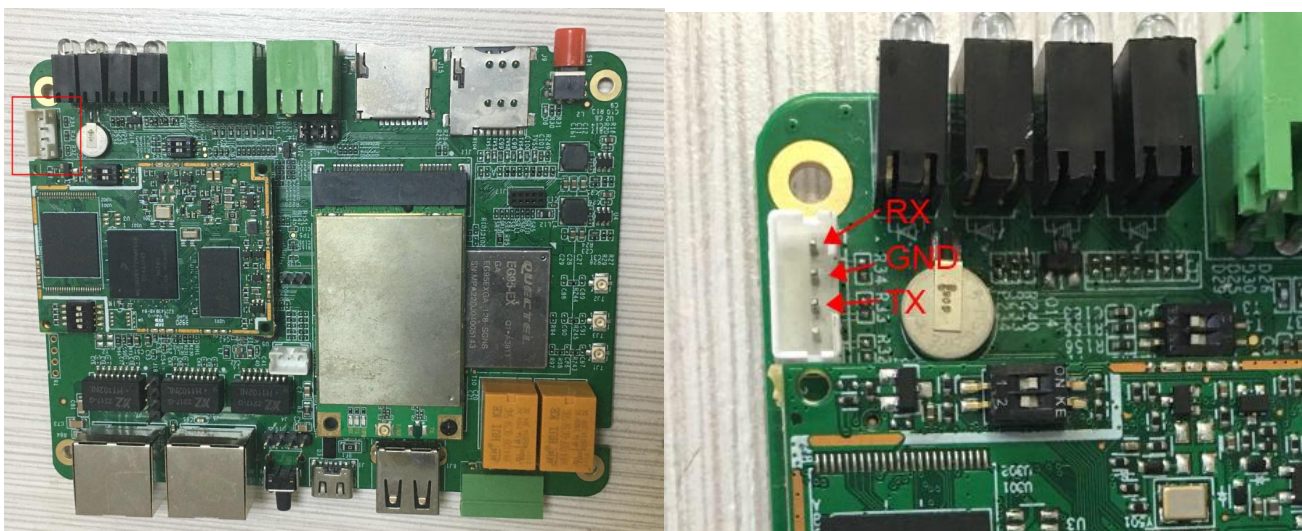
3. System Testing

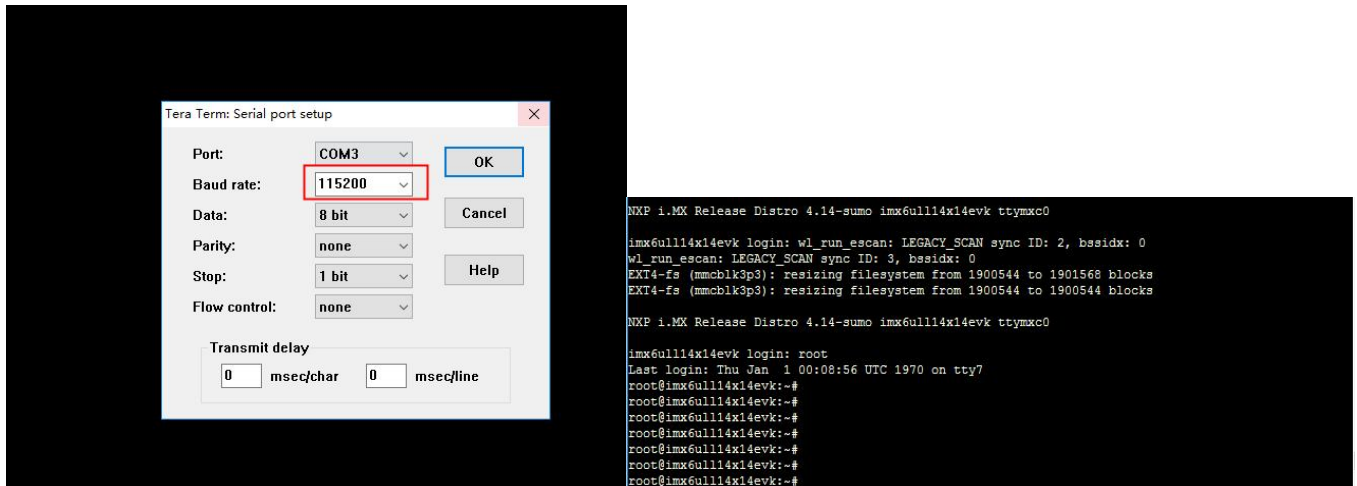
3.1 Access System

3.1.1 Serial Port Tools

Using the included serial board cable, connect the usb port to the computer and the 4Pin waterproof airline connector to the case, open the serial port tool (Putty/ttermpro, etc.), set the baud rate to 115200.

If you are prompted for the system password, enter **root** to enter the system





3.1.2 Remote Control

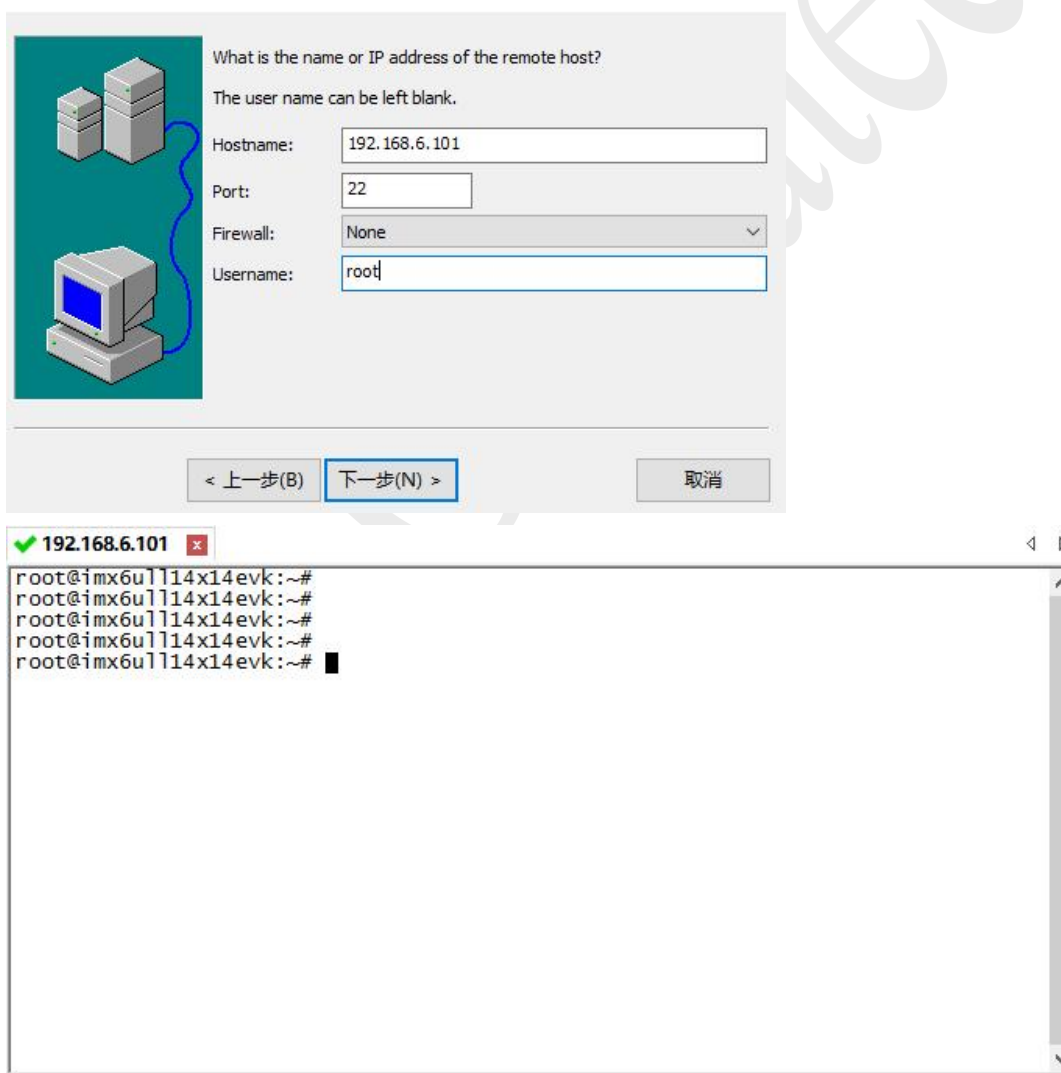
The computer needs to be on the same LAN as the GTW361, query the IP address obtained by the device through the serial command `ifconfig`, and set the IP address obtained by the query Address and use SSH to connect via a serial tool (putty/TeraTerm, etc.).

Protocol: SSH2

Username: `root`

Password: no

New Session Wizard



3.2 WiFi

Connection is made via terminal commands. The connection command, as follows:

```
nmcli dev wifi rescan //Scan the network
nmcli dev wifi list //Scan to the WiFi list
nmcli dev wifi con salen password 11111111 //Connect to encrypted WiFi
nmcli dev wifi con TP-LINK_20EE //Connect to unencrypted WiFi
nmcli dev status //views the current
nmcli con show //views the saved
nmcli dev dis wlan0 //Disconnect the current connection
nmcli con del Xiaomi_B5EF5G //Delete saved connections
```

```
root@imx6ull14x14evk:~# nmcli dev wifi rescan
Error: Scanning not allowed immediately following previous scan.
root@imx6ull14x14evk:~# EXT4-fs (mmcblk3p3): resizing filesystem from 1900544 to 1901568 blocks
EXT4-fs (mmcblk3p3): resizing filesystem from 1900544 to 1900544 blocks

root@imx6ull14x14evk:~# nmcli dev wifi list
NM-USE SSID MODE CHAN RATE SIGNAL BARS SE>
test2g Infra 1 270 Mbit/s 100 **** WP>
HUAWEI-H10V21 Infra 1 270 Mbit/s 100 **** -->
salen Infra 11 270 Mbit/s 100 **** WP>
geniatech-1-24G Infra 8 130 Mbit/s 97 **** -->
geniatech360 Infra 11 270 Mbit/s 97 **** WP>
ZH_TEST Infra 12 270 Mbit/s 94 **** WP>
YJ_2.4G Infra 6 270 Mbit/s 92 **** WP>
XL Infra 1 270 Mbit/s 84 **** WP>
-- Infra 1 270 Mbit/s 82 **** WP>
lh Infra 6 270 Mbit/s 80 *** WP>
TP-LINK_B8CB-2.4G Infra 1 270 Mbit/s 72 *** WP>
HP-Print-76-LaserJet Pro MFP Infra 6 65 Mbit/s 65 *** -->
geniatech-x3 Infra 2 130 Mbit/s 64 *** WP>
geniatech-google1 Infra 4 270 Mbit/s 59 *** WP>
-- Infra 36 540 Mbit/s 57 *** WP>
test5g Infra 36 540 Mbit/s 55 ** -->
XL100M_03eb Infra 11 130 Mbit/s 49 ** WP>
AHJX-2 Infra 6 270 Mbit/s 39 ** WP>
HUAWEI-H10V21_5G Infra 36 270 Mbit/s 37 ** -->
F5chukouchufa Infra 5 54 Mbit/s 35 ** WP>
YJ 5G Infra 149 405 Mbit/s 29 * WP>
TP-LINK_5G_B8CB_5G Infra 161 270 Mbit/s 29 * WP>

root@imx6ull14x14evk:~# wl_run_escan: LEGACY_SCAN sync ID: 4, bssid: 0

root@imx6ull14x14evk:~# nmcli dev wifi con salen password 11111111
wl_run_escan: LEGACY_SCAN sync ID: 5, bssid: 0
Connecting with b8:f8:83:86:e6:a9 ssid "salen", len (5) channel=11

dhd_dbg_start_pkt_monitor, 1724
wl_iw_event: Link UP with b8:f8:00:00:e6:a9
wl_bss_connect_done succeeded with b8:f8:83:86:e6:a9
IPv6: ADDRCONF(NETDEV_CHANGE): wlan0: link becomes ready
wl_bss_connect_done succeeded with b8:f8:83:86:e6:a9
device 'wlan0' successfully activated with 'bc7dc327-ef32-4572-9301-d83ce0cadfad'.
root@imx6ull14x14evk:~# ifconfig
eth0 Link encap:Ethernet HWaddr 82:28:40:43:57:51
inet6 addr: fe80::7e85:bebd:c105:f27c/64 Scope:Link
UP BROADCAST RUNNING MULTICAST DYNAMIC MTU:1500 Metric:1
RX packets:0 errors:0 dropped:0 overruns:0 frame:0
TX packets:91 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:0 (0.0 B) TX bytes:19771 (19.3 KiB)

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:252 errors:0 dropped:0 overruns:0 frame:0
TX packets:252 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:18480 (18.0 KiB) TX bytes:18480 (18.0 KiB)

wlan0 Link encap:Ethernet HWaddr 78:4b:87:ea:a5:c7
inet addr:192.168.6.103 Bcast:192.168.6.255 Mask:255.255.255.0
inet6 addr: fe80::dfd9:5c16:7777:c4ea/64 Scope:Link
UP BROADCAST RUNNING MULTICAST DYNAMIC MTU:1500 Metric:1
RX packets:14 errors:0 dropped:0 overruns:0 frame:0
```

3.3 Ethernet

Plug the cable into the network port (bit number J6/J8) and check to get the IP address & ping Baidu without any abnormality by the command: [ifconfig](#).

```
root@imx6ull14x14evk:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 42:03:d8:23:92:2d
          inet addr:192.168.6.103  Bcast:192.168.6.255  Mask:255.255.255.0
          inet6 addr: fe80::cdd5:e84a:cef7:fbdc/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST DYNAMIC MTU:1500 Metric:1
          RX packets:125 errors:0 dropped:0 overruns:0 frame:0
          TX packets:150 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:27620 (26.9 KiB)  TX bytes:21874 (21.3 KiB)

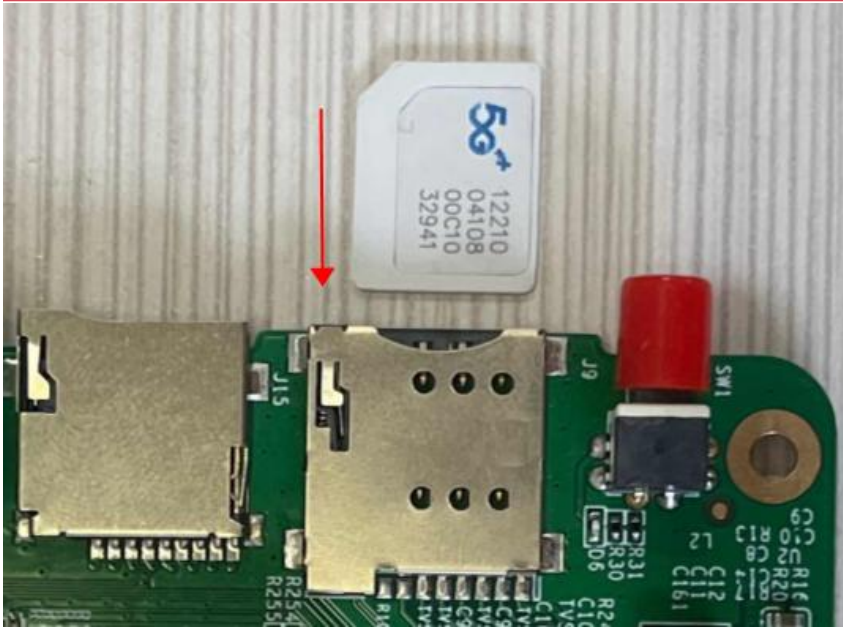
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING MTU:65536 Metric:1
          RX packets:112 errors:0 dropped:0 overruns:0 frame:0
          TX packets:112 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:9002 (8.7 KiB)  TX bytes:9002 (8.7 KiB)

wlan0     Link encap:Ethernet  HWaddr 78:4b:87:ea:a5:c7
          UP BROADCAST MULTICAST DYNAMIC MTU:1500 Metric:1
          RX packets:31 errors:0 dropped:0 overruns:0 frame:0
          TX packets:78 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5172 (5.0 KiB)  TX bytes:13381 (13.0 KiB)

root@imx6ull14x14evk:~# ping baidu.com
PING baidu.com (39.156.66.10) 56(84) bytes of data:
64 bytes from 39.156.66.10 (39.156.66.10): icmp_seq=1 ttl=50 time=23.0 ms
64 bytes from 39.156.66.10 (39.156.66.10): icmp_seq=2 ttl=50 time=23.1 ms
wl_run_escan: LEGACY_SCAN sync ID: 3, bssid: 0
64 bytes from 39.156.66.10 (39.156.66.10): icmp_seq=3 ttl=50 time=23.1 ms
64 bytes from 39.156.66.10 (39.156.66.10): icmp_seq=4 ttl=50 time=22.3 ms
^C
--- baidu.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 7040ms
rtt min/avg/max/mdev = 22.313/22.928/23.180/0.359 ms
root@imx6ull14x14evk:~#
```

3.4 LTE Module

SIM card should be connected with the SIM card notch facing outward, and does not support hot-swapping, please insert the SIM card before the device is powered on. After power on, wait for about 2Min, command: [ifconfig](#), check the generated PPP0 node and Ping Baidu



```

root@imx6ull14x14evk:~#
root@imx6ull14x14evk:~# ifconfig
eth0      Link encap:Ethernet HWaddr 56:a0:9e:37:86:e1
          inet6 addr: fe80::221b:b6e6:5cec:1274/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST DYNAMIC MTU:1500 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:98 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:21555 (21.0 KiB)

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:322 errors:0 dropped:0 overruns:0 frame:0
          TX packets:322 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:23500 (22.9 KiB)  TX bytes:23500 (22.9 KiB)

ppp0      Link encap:Point-to-Point Protocol
          inet addr:10.146.125.148 P-t-P:10.64.64.64 Mask:255.255.255.255
          UP POINTOPOINT RUNNING NOARP MULTICAST MTU:1500 Metric:1
          RX packets:5 errors:0 dropped:0 overruns:0 frame:0
          TX packets:6 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:3
          RX bytes:62 (62.0 B)  TX bytes:101 (101.0 B)

wlan0     Link encap:Ethernet HWaddr 78:4b:87:ea:a5:c7
          UP BROADCAST MULTICAST DYNAMIC MTU:1500 Metric:1
          RX packets:2 errors:0 dropped:0 overruns:0 frame:0
          TX packets:5 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:198 (198.0 B)  TX bytes:536 (536.0 B)

root@imx6ull14x14evk:~# ping baidu.com
PING baidu.com (39.156.66.10) 56(84) bytes of data:
IPV6: ADDRCONF(NETDEV_UP): wlan0: link is not ready
wl_run_escan: LEGACY_SCAN sync ID: 9, bssid: 0
wl_run_escan: LEGACY_SCAN sync ID: 10, bssid: 0
64 bytes from 39.156.66.10 (39.156.66.10): icmp_seq=1 ttl=52 time=53.8 ms
64 bytes from 39.156.66.10 (39.156.66.10): icmp_seq=2 ttl=52 time=155 ms
64 bytes from 39.156.66.10 (39.156.66.10): icmp_seq=3 ttl=52 time=59.4 ms
64 bytes from 39.156.66.10 (39.156.66.10): icmp_seq=4 ttl=52 time=48.5 ms
64 bytes from 39.156.66.10 (39.156.66.10): icmp_seq=5 ttl=52 time=45.2 ms
^C
--- baidu.com ping statistics ---
6 packets transmitted, 5 received, 16% packet loss, time 9106ms
rtt min/avg/max/mdev = 45.297/72.508/155.414/41.731 ms
root@imx6ull14x14evk:~#

```

3.5 RTC

Terminal input command:

`date -s "2022-11-10 18:18:00"` //Write RTC time

`hwclock -w` //RTC time written to hardware clock

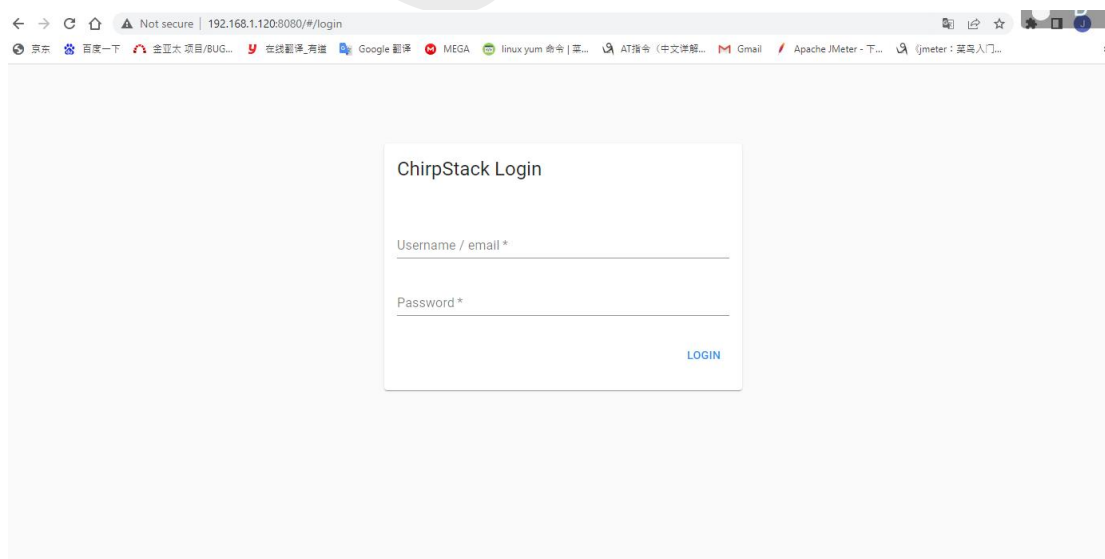
`hwclock -r` or `date` //Read RTC time

```
root@imx6ull14x14evk:~# date -s"2022-11-10 18:18:00"
Thu Nov 10 18:18:00 UTC 2022
root@imx6ull14x14evk:~# hwclock -w
rtc_am1805_write_time
rtc_am1805 : write the rtc time, time is 1668104284
2022-11-10 18:18:04
write time 2022-11-10 18:18:04
rtc_am1805_i2c_write:i2c write register
rtc_am1805_i2c_write i2c write 01
rtc_am1805_i2c_write i2c write 04
rtc_am1805_i2c_write i2c write 18
rtc_am1805_i2c_write i2c write 18
rtc_am1805_i2c_write i2c write 10
rtc_am1805_i2c_write i2c write 11
rtc_am1805_i2c_write i2c write 52
rtc_am1805_i2c_write i2c write 04
rtc_am1805 : the time has been written
root@imx6ull14x14evk:~# hwclock -r
Thu Nov 10 18:18:07 2022 0.000000 seconds
root@imx6ull14x14evk:~# date
Thu Nov 10 18:18:09 UTC 2022
root@imx6ull14x14evk:~#
```

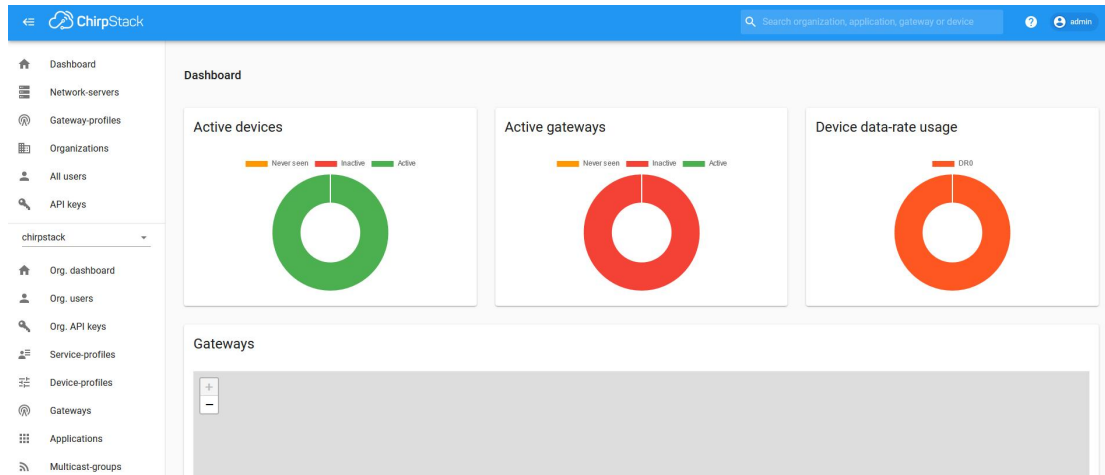
3.6 LoRa 868MHz

Configure the Lora server and register the gateway and devices, Access to the device LoRa server page

3.6.1 Get the computer and the device on the same LAN, open a browser, then type: `https:// box IP : 8080` (username: admin password: admin) Example: `http://192.168.1.120:8080`



3.6.2 Login and go to the Dashboard page.



3.6.3 Click on the "network-servers" screen, click on ADD and add a generic network service.

Network-server name :Network server name; (user-defined)

Network-server server: Network server IP and port; (default: **localhost:8000**)

After completing, click "**ADD NETWORK-SERVER**".

3.6.4 Add configuration Service-profiles,Fill in the following configuration.

Service-profile name: the name of the service profile; (user-definable)

Network-server: select the network server added in the previous step; (user-definable)

Add gateway meta-data: Allow NS to send gateway meta-data to the application server

Click **CREATE SERVICE-PROFILE** after filling in the fields.

The top screenshot shows the 'Create Service Profile' form in the ChirpStack web interface. The form includes the following fields and options:

- Service-profile name ***: lora-server
- Network-server ***: lora-gateway
- ☒ **Add gateway meta-data**: GW metadata (RSSI, SNR, GW geoloc., etc.) are added to the packet sent to the application-server.
- ☐ **Enable network geolocation**: When enabled, the network-server will try to resolve the location of the devices under this service-profile. Please note that you need to have gateways supporting the fine-timestamp feature and that the network-server needs to be configured in order to provide geolocation support.
- Device-status request frequency**: 0
- Frequency to initiate an End-Device status request (request/day)**: Set to 0 to disable.
- Minimum allowed data-rate ***: 0
- Maximum allowed data-rate ***: 0
- ☐ **Private gateways**: Gateways under this service-profile are private. This means that these gateways can only be used by devices under the same service-profile.

The bottom screenshot shows the 'Service-profiles' list in the ChirpStack web interface. It displays a table with one entry:

Name	Network Server
lora-server	

The table has a pagination bar showing 'Rows per page: 10' and '1-1 of 1'.

3.6.5 Adding a configuration device-profile

Click on "Create" on the "Device-profiles" page.

Fill in the following configuration.

Device-profile name: The name of the device profile. (User-defined)

Network-server: Select the network server created before.

LoRaWAN MAC version: select LoRaWAN protocol version, 1.0.2 is recommended (you cannot select 1.1.0, this toolkit is not supported).

LoRaWAN Regional Parameters revision: Select A.

ChirpStack

Search organization, application, gateway or device

admin

Dashboard

Network-servers

Gateway-profiles

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chirpstack

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Service-profiles

Device-profiles

Gateways

Applications

Multicast-groups

Device-profiles / Create

GENERAL JOIN (OTAA / ABP) CLASS-B CLASS-C CODEC TAGS

Device-profile name *

lora-device

A name to identify the device-profile.

Network-server *

lora-gateway

The network-server on which this device-profile will be provisioned. After creating the device-profile, this value can't be changed.

LoRaWAN MAC version *

1.0.2

The LoRaWAN MAC version supported by the device.

LoRaWAN Regional Parameters revision *

A

Revision of the Regional Parameters specification supported by the device.

ADR algorithm *

Select ADR algorithm

The ADR algorithm that will be used for controlling the device data-rate.

Max EIRP *

0

Maximum EIRP supported by the device.

Uplink interval (seconds) *

4

The expected interval in seconds in which the device sends uplink messages. This is used to determine if a device is active or inactive.

3.6.6 In the second column, configure the network access method of the node, and check the box "Device supports OTAA".

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Service-profiles

Device-profiles

Gateways

Applications

Multicast-groups

Device-profiles / lora-device

DELETE

GENERAL JOIN (OTAA / ABP) CLASS-B CLASS-C CODEC TAGS

☒ Device supports OTAA

UPDATE DEVICE-PROFILE

Click CREATE DEVICE-PROFILE to complete the creation.

3.6.7 Adding a Configuration Gateway

Go to the **Gateways** page and click **CREATE**.

Fill in the following configuration.

Gateway name: Gateway name; (user-definable)

Gateway description: Gateway description; (user-definable)

Room 02-04, 10/F, Block A, Building 8, Shenzhen International Innovation Valley, Dashi Road,
Nanshan District, Shenzhen, Guangdong, China

Email: support@geniatech.com Tel: (+ 86) 755 86028588

Gateway ID: Gateway ID (you can see it in the output information of the gateway; terminal input: `cat /usr/share/lora_sx1302/global_conf.json`)

```
"gateway_conf": {
  "gateway_id": "9a45dcfffe31464",
  /* change with default server address/ports */
  "server_address": "localhost",
  "serv_port_up": 1700,
  "serv_port_down": 1700,
  /* adjust the following parameters for your network */
  "keepalive_interval": 10,
  "stat_interval": 30,
  "push_timeout_ms": 100,
  /* forward only valid packets */
  "forward_crc_valid": true,
  "forward_crc_error": false,
  "forward_crc_disabled": false,
  /* GPS configuration */
  "gps_tty_path": "/dev/ttyS0",
  /* GPS reference coordinates */
  "ref_latitude": 0.0,
  "ref_longitude": 0.0,
  "ref_altitude": 0,
  /* Beaconsing parameters */
  "beacon_period": 0,
  "beacon_freq_hz": 869525000,
  "beacon_datarate": 9,
  "beacon_bw_hz": 125000,
  "beacon_power": 14,
  "beacon_infodesc": 0
},
"debug_conf": {
  "ref_payload": [
    { "id": "0xCAFE1234" },
    { "id": "0xCAFE2345" }
  ],
  "log_file": "loragw_hal.log"
}
```

The screenshot shows the ChirpStack web interface for creating a new gateway. The left sidebar contains navigation links for Dashboard, Network-servers, Gateway-profiles, Organizations, All users, API keys, and various organizational settings. The main content area is titled 'Gateways / Create' and features a form with three tabs: GENERAL, TAGS, and METADATA. The GENERAL tab is selected, displaying the following fields:

- Gateway name:** lora-gateway (with a note: 'The name may only contain words, numbers and dashes.')
- Gateway description:** test
- Gateway ID:** 9a 45 dc ff fe e3 14 64 (with a 'MSB' icon)
- Network-server:** lora-gateway (with a dropdown arrow)
- Service-profile:** lora-server (with a dropdown arrow)
- Gateway-profile:** Select gateway-profile (with a dropdown arrow)
- ☐ **Gateway discovery enabled** (with a note: 'When enabled (and ChirpStack Network Server is configured with the gateway discover feature enabled), the gateway will send out periodical pings to test its coverage by other gateways in the same network.')
- Gateway altitude (meters):** 0

Click **"CREATE GATEWAY"** to complete the creation.

3.6.8 Adding a configuration terminal

Enter the **"Applications"** screen and click **"Create"**.

Application name: Application name; (user-definable)

Application description: Application description (user-definable)

Service-profile: Select the service profile created earlier.

ChirpStack

Search organization, application, gateway or device

admin

Dashboard

Network-servers

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Gateways

Applications

Multicast-groups

Applications / Create

Application name *

terminal

The name may only contain words, numbers and dashes.

Application description *

test

Service-profile *

lora-server

The service-profile to which this application will be attached. Note that you can't change this value after the application has been created.

CREATE APPLICATION

Click **CREATE APPLICATION** to complete the creation.

3.6.9 Click on the created application and click Create to create the terminal device; before that, please get two properties of the terminal device: "**Device EU**" and "**Application key**".

ChirpStack

Search organization, application, gateway or device

admin

Dashboard

Network-servers

Gateway-profiles

Organizations

All users

API keys

chirpstack

Org. dashboard

Org. users

Org. API keys

Service-profiles

Device-profiles

Gateways

Applications

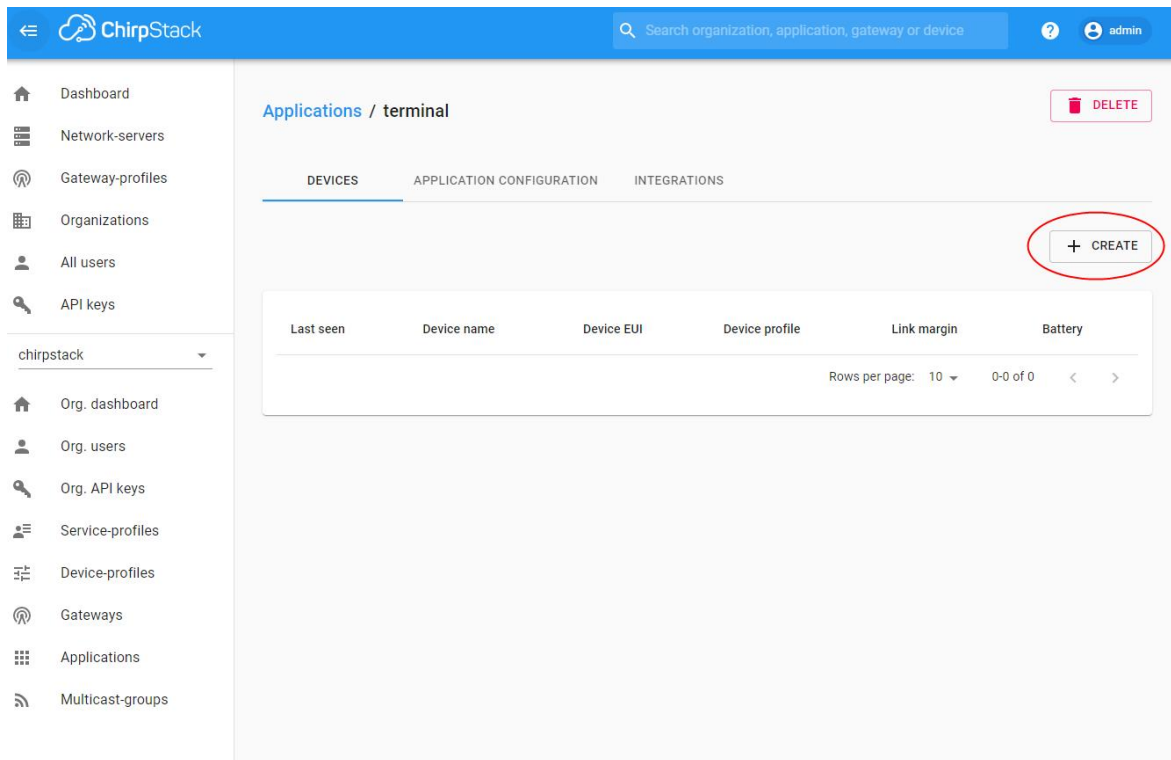
Multicast-groups

Applications

+ CREATE

ID	Name	Service-profile	Description
2	terminal	lora-server	test

Rows per page: 10 1-1 of 1

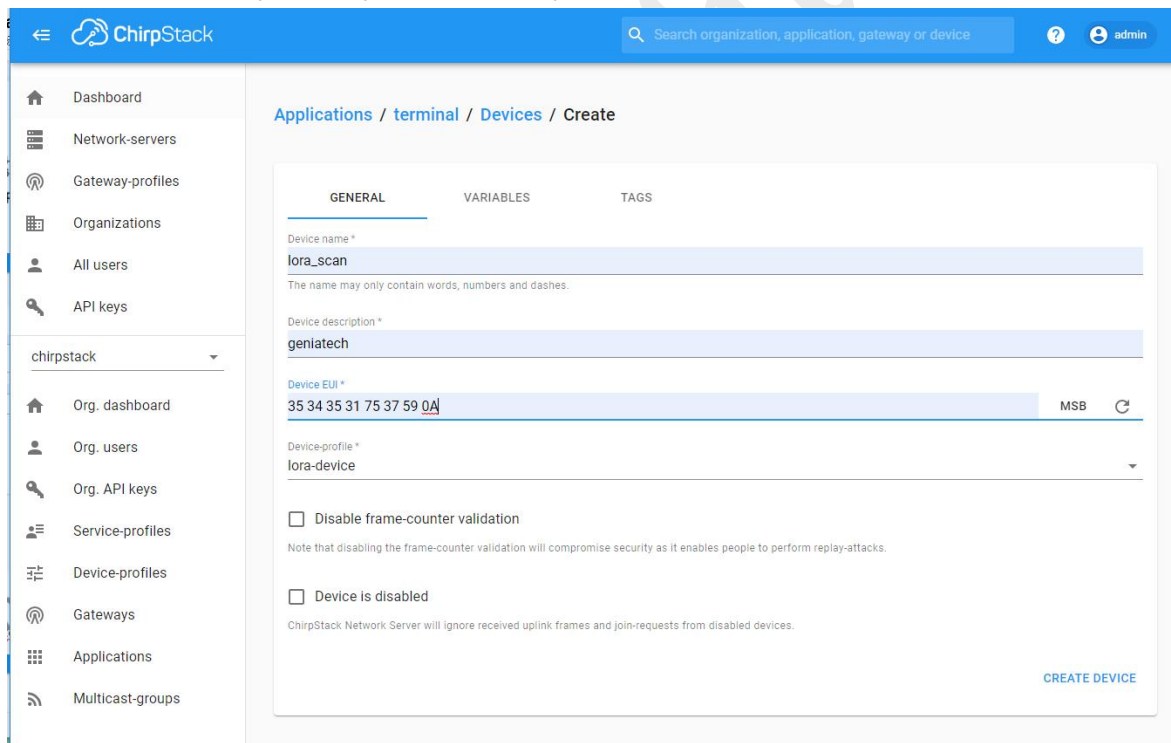


Device name: Device name; (user-definable)

Device description: Device description; (user-defined)

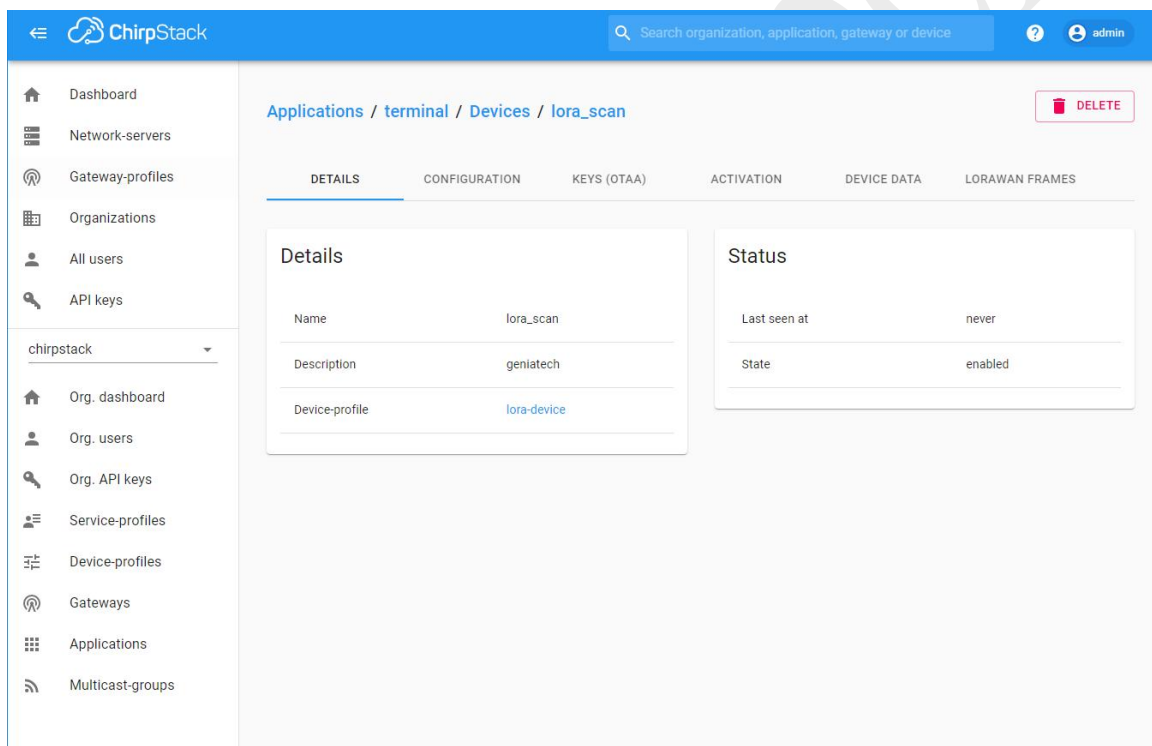
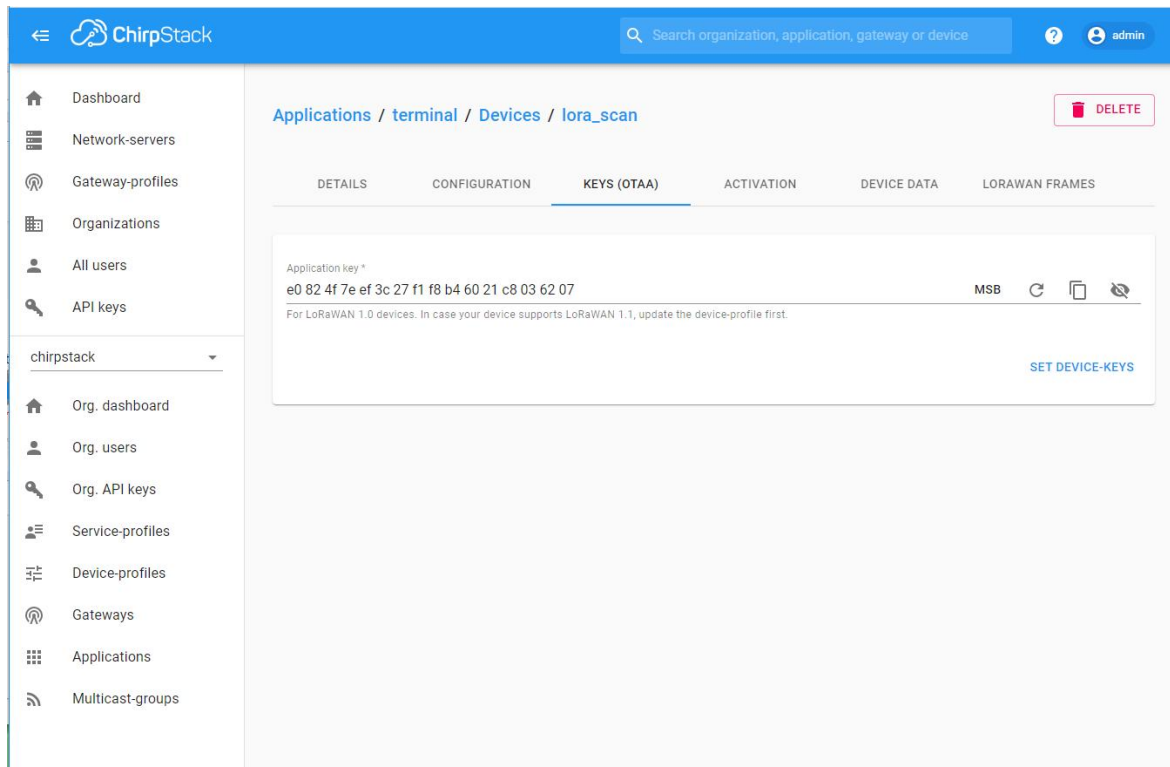
Device EUI: Please get it from the terminal device.

Device EUI: Select the previously created device profile.



Click "CREATE DEVICE" to complete the creation.

3.6.10 Application key: Please get it from the terminal device.



3.6.11 When you are done adding, click **LORAWAN FRAMES**.

Data Communication

1.UPLINK

The terminal can send data such as network access information, and the received data is displayed on the screen.

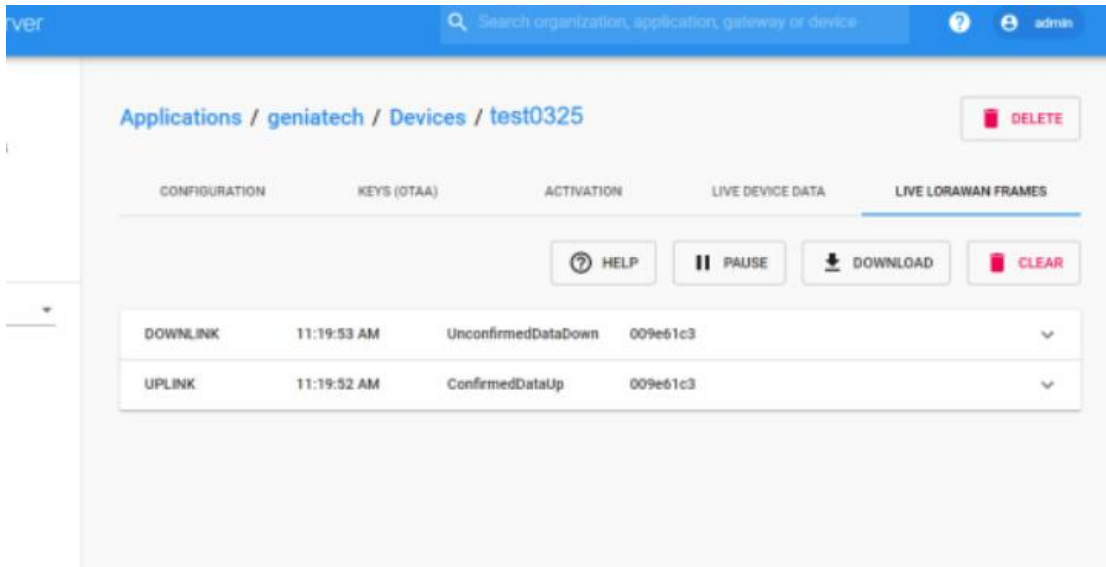
2. Downlink

Select "**DETAILS**" and fill in the device port in "**Enqueue downlink payload**". As shown below, you can get it from the UPLINK data.

Note:

The transferred data needs to be Base64 encoded

If the port is incorrectly filled, the end device will not be able to receive the data.



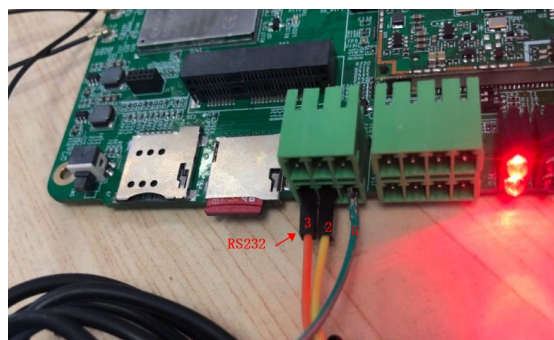
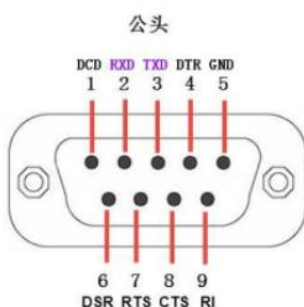
3.7 RS232

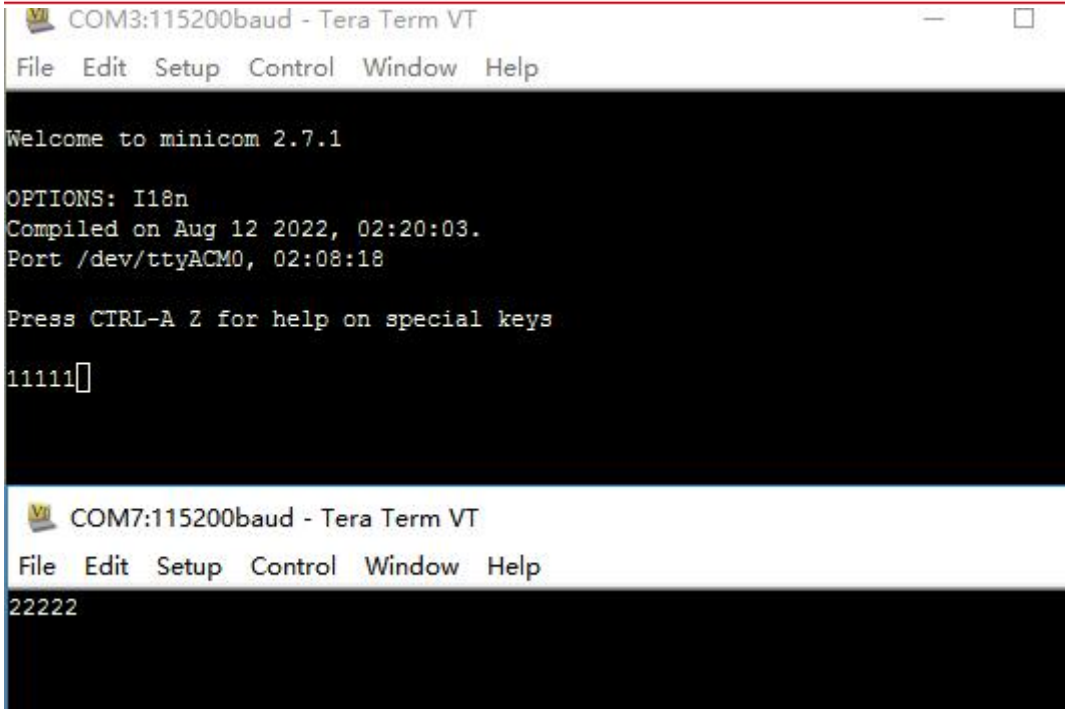
3.7.1 Prerequisites:

- USB to RS232 conversion cable
- Host PC (64-bit support only)
- Serial tool (termpro)



3.7.2 Hardware connection: Connect the 232 (under bit number: J13) on the motherboard to the PC via USB to 232. pins 2/3/5 of USB to 232 are connected to the 232 on the motherboard according to 3/2/5 respectively.





3.8 RS485

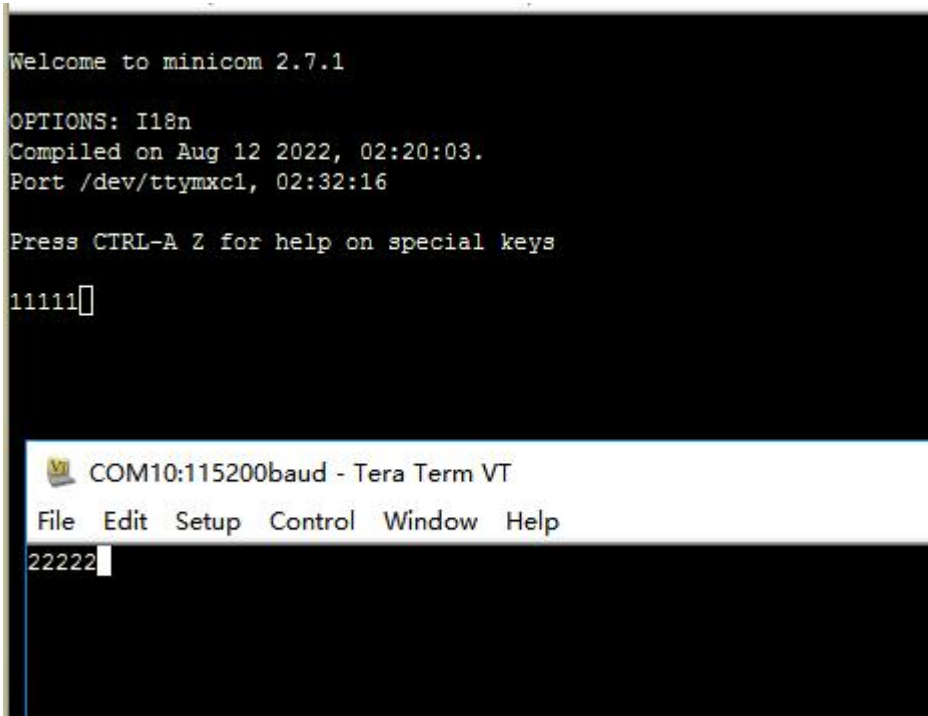
3.8.1 Prerequisites:

- USB to RS485 conversion cable
- Host PC (64-bit support only)
- Serial tool (termpro)



3.8.2 Hardware connection: Connect the 485 (bit number: J13) on the motherboard to the PC via USB to 485. pins 1/2/5 of USB to 485 are connected to the 485 on the motherboard according to 2/1/5 respectively.



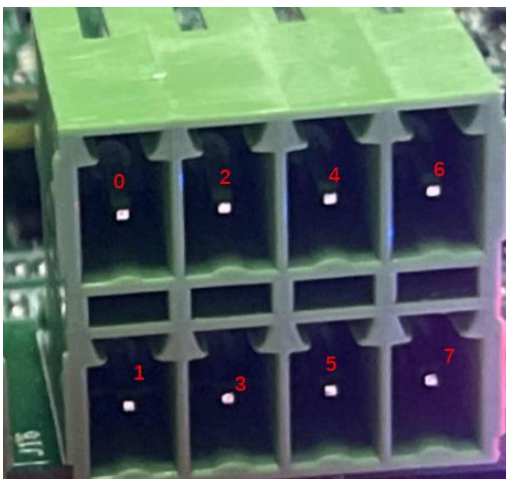


3.9 Relay&GPIO

3.9.1 Terminal input command:

```
i2cset -f -y 1 0x20 0x02 0x00 b //All bytes are low, multimeter measures 0V
i2cset -f -y 1 0x20 0x06 0x00 b //The 0th byte is pulled high and measured around 3.3V by multimeter
i2cset -f -y 1 0x20 0x06 0x01 b //The 1th byte is pulled high and measured around 3.3V by multimeter
i2cset -f -y 1 0x20 0x06 0x02 b //The 2th byte is pulled high and measured around 3.3V by multimeter
i2cset -f -y 1 0x20 0x06 0x04 b //The 3th byte is pulled high and measured around 3.3V by multimeter
i2cset -f -y 1 0x20 0x06 0x08 b //The 4th byte is pulled high and measured around 3.3V by multimeter
i2cset -f -y 1 0x20 0x06 0x10 b //The 5th byte is pulled high and measured around 3.3V by multimeter
i2cset -f -y 1 0x20 0x06 0x20 b //The 6th byte is pulled high and measured around 3.3V by multimeter
i2cset -f -y 1 0x20 0x06 0x40 b //The 7th byte is pulled high and measured around 3.3V by multimeter
i2cset -f -y 1 0x20 0x06 0x80 b //All bytes are high, multimeter measures 3.3V
```

The bytes correspond in order, as shown in the following figure:



3.9.2 Relay terminal input command:

`i2cset -f -y 1 0x20 0x03 0x30 b` //relay1 and relay2 are both on

`i2cset -f -y 1 0x20 0x03 0x00 b` //relay1 and relay2 are both closed

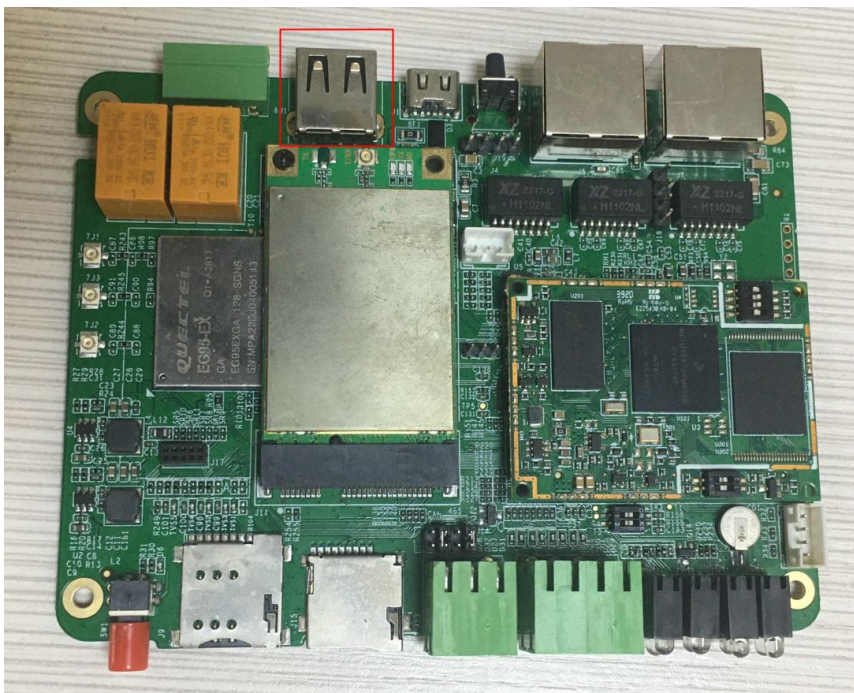
Remark: Relays open or close with a tick or a tock

3.10 USB Interface

3.10.1 USB interface through the carrier board dialing to achieve different functions, set the dialing switch:

1-ON 2-ON, USB interface normal function interface

1-OFF 2-OFF, USB The interface is a burn-in function



3.10.2 Insert the USB stick and enter the terminal command:

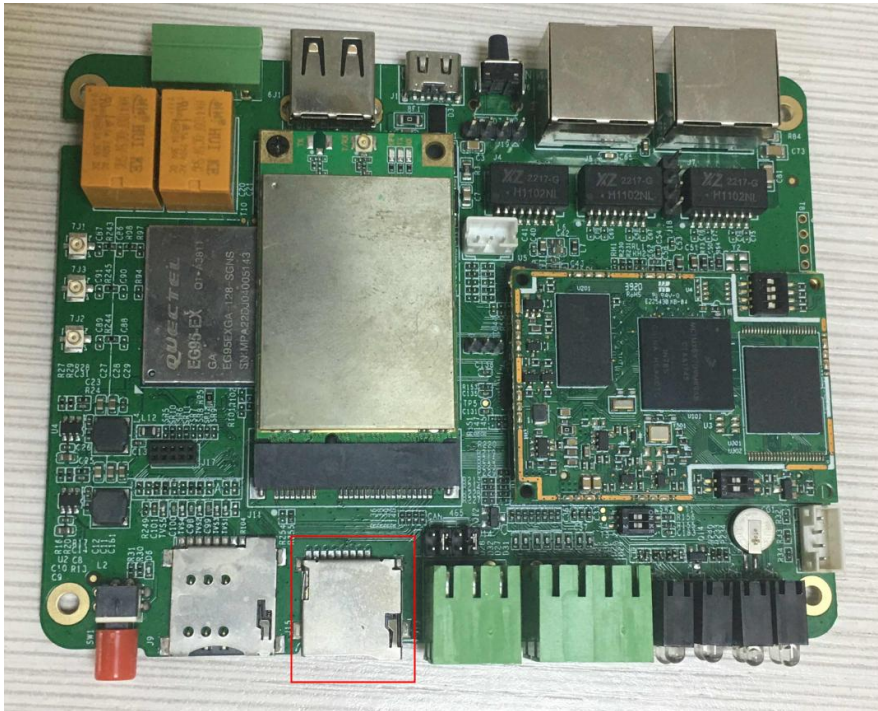
`df -h` //View the USB drive mount path

```
root@imx6ull14x14evk:~#
root@imx6ull14x14evk:~# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root        6.9G  888M  5.7G  14% /
devtmpfs         85M   4.0K   85M   1% /dev
tmpfs            246M   0    246M   0% /dev/shm
tmpfs            246M  25M   221M  11% /run
tmpfs            246M   0    246M   0% /sys/fs/cgroup
tmpfs            246M  4.0K   246M   1% /tmp
tmpfs            246M  252K   245M   1% /var/volatile
/dev/mmcblk3p1   16M   8.6M   7.5M  54% /run/media/mmcblk3p1
tmpfs            50M   1.3M   48M   3% /run/user/0
/dev/sda1        15G   56M   15G   1% /run/media/sda1
root@imx6ull14x14evk:~# ls /run/media/sda1/
SStarOta.bin.gz System Volume Information otaunpack test.mp4
root@imx6ull14x14evk:~#
```

3.11 TF Card

Insert the TF card and enter the command at the terminal:

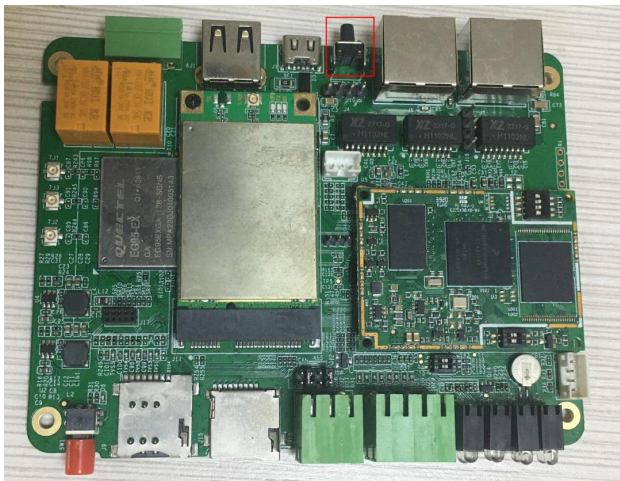
df -h //View TF card mount path



```
root@imx6ull14x14evk:~# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root        6.9G  888M  5.7G   14% /
devtmpfs         85M   4.0K   85M    1% /dev
tmpfs            246M    0  246M    0% /dev/shm
tmpfs            246M   25M  221M   11% /run
tmpfs            246M    0  246M    0% /sys/fs/cgroup
tmpfs            246M  4.0K  246M    1% /tmp
tmpfs            246M  672K  245M    1% /var/volatile
/dev/mmcblk3p1   16M   8.6M   7.5M   54% /run/media/mmcblk3p1
tmpfs            50M   1.3M   48M    3% /run/user/0
/dev/sda1        1.9G   32M   1.9G    2% /run/media/sda1
root@imx6ull14x14evk:~# ls /run/media/sda1/
abcd.iso
root@imx6ull14x14evk:~#
```

3.12 Reboot

System restarts with a short press of the SW2 button; the serial port reprints the information




```

imx6ull14x14evk login:
MKP 1.MX Release Distro 4.14-sumo imx6ull14x14evk ttyMXC0

imx6ull14x14evk login: root
Last login: Thu Jan 1 03:56:03 UTC 1970 on tty7
root@imx6ull14x14evk:~#
root@imx6ull14x14evk:~#
root@imx6ull14x14evk:~#
root@imx6ull14x14evk:~#
root@imx6ull14x14evk:~#

U-Boot 2018.03-imx_v2018.03_4.14.78_1.0.0_ga+g16419f274f (Aug 12 2022 - 02:13:12 +0000)

CPU: Freescale i.MX6ULL rev1.1 792 MHz (running at 396 MHz)
CPU: Industrial temperature grade (-40C to 105C) at 44C
Reset cause: POR
Model: Freescale i.MX6 ULL 14x14 EVK Board
Board: MX6ULL 14x14 EVK
DRAM: 512 MiB
MMC: FSL_SDHC: 0, FSL_SDHC: 1
Loading Environment from MMC... *** Warning - bad CRC, using default environment

Failed (-5)
Display: TFT43AB (480x272)
Video: 480x272x24
In: serial
Out: serial
Err: serial
switch to partitions #0, OK
mmc1(part 0) is current device
flash target is MMC:1
Net: no params partition
idx 0, ptn 0 name='gpt' start=0 len=2048
idx 1, ptn 0 name='tos' start=0 len=2047
idx 2, ptn 0 name='all' start=0 len=15269888
idx 3, ptn 0 name='bootloader' start=2 len=8192
idx 4, ptn 1 name='mmscdh1' start=8192 len=32768
idx 5, ptn 2 name='mmscdh2' start=40960 len=16384
idx 6, ptn 3 name='mmscdh3' start=57344 len=15212544
no mmscdh2 partition
idx 0, ptn 0 name='gpt' start=0 len=2048
idx 1, ptn 0 name='tos' start=0 len=2047

```