

GTW361 yocto System Software

User's Guide

V1.0



Contents

1. Overview	1
2. System burn-in	1
2.1 Prerequisites	1
2.2 Download burn-in firmware & tools	1
2.3 Switching the motherboard to burn-in mode	
2.4 PC identification GTW361	2
2.5 Burning steps	
2.6 Burning in	
3. System Testing	
3.1 Access System	4
3.2 WiFi	6
3.3 Ethernet	7
3.4 LTE Module	7
3.5 RTC	9
3.6 LoRa 868MHz	9
3.7 RS232	
3.8 RS485	
3.9 Relay&GPIO	
3.10 USB Interface	
3.11 TF Card	
3.12 Reboot	



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

🔤 管理员: C:\Windows\System32\cmd.exe



2.6 Burning in



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



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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			×	
	What is the name The user name ca Hostname: Port: Firewall: Username:	e or IP address of the remote host? an be left blank. 192.168.6.101 22 None root	~ 	
✓ 192.168.6.101	< 上一步(B)	下一步(N) >	取消	4 4
root@imx6u]14) root@imx6u]14) root@imx6u]14) root@imx6u]14) root@imx6u]14)	14evk:~# 14evk:~# 14evk:~# 14evk:~# 14evk:~#			~

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3.2 WiFi

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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 ot@imx6ull14x14evk:~# nmcli dev wifi rescan Tror: Scanning not allowed immediately following previous scan. coot@imx6ull14x14evk:~# EXT4-fs (mmcblk3p3): resizing filesystem from 1900544 to 1901568 blocks IXT4-fs (mmcblk3p3): resizing filesystem from 1900544 to 1900544 blocks oot@imx6ull14x14evk:~# nmcli dev wifi list CHAN RATE SIGNAL BARS SE> N-USE SSID MODE 270 Mbit/s WP> --> WP> 270 Mbit/s 130 Mbit/s 270 Mbit/s 94 270 Mbit/s 92 270 Mbit/s 84 ZH TEST WP> WP> WP> 270 Mbit/s WP> 270 Mbit/s 80 Infra WP> TP-LINK_B8CB-2.4G 270 Mbit/s WP> HP-Print-76-LaserJet Pro MFP 65 Mbit/s 65 130 Mbit/s 64 geniatech-x3 WP> Infra 270 Mbit/s geniatech-google1 WP> Infra 540 Mbit/s *** Infra WP> --> -2 EI-H10V21_5G ukouchufa YJ_5G Infra 149 405 Mbit/s 29 TP-LINK_5G_B8CB_5G Infra 161 270 Mbit/s 29 * pot@imx6ull14x14evk:~# wl_run_escan: LEGACY_SCAN sync ID: 4, bssidx: 0 WP> WP> ot@imx6ull14x14evk:~# nmcli dev wifi con salen password 11111111 l_run_escan: LEGACY_SCAN sync ID: 5, bssidx: 0 onnecting with b8:f8:83:86:e6:a9 ssid "salen", len (5) channel=11 nd_dbg_start_pkt_monitor, 1724 liw_event: Link UP with b8:f8:00:00:e6:a9 _bss_connect_done succeeded with b8:f8:83:86:e6:a9 Próf: ADDRCONF(NETDEV_CHANGE): wlan0: link becomes ready hl_bss_connect_done succeeded with b8:f8:83:86:e6:a9 evice 'wlan0' successfully_activated with 'bc7dc327-ef32-4572-9301-d83ce0cadfad'. evice wiano successing activated with berdes27-ei32-4372-9301-0
oot@imx6ull14x14evk-___ifconfig
th0 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
 TV packets: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) Link encap:Local Loopback Link Encap:Local Loopback inet addr:127.0.0.1 Mask:255.0.0.0 inet6 addr: ::/1/28 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) 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 anO UP BROADCAST RUNNING MULTICAST DYNAMIC MIU:1500 Metric:1

ets:14 errors:0 dropped:0 overruns:0 fram

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@imx6ull14x14ev}	: ~ =
root@imx6ull14x14ev}	::~# ifconfig
eth0 Link encag	p: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 addi	: 1e80::cdd5:e84a:cef7:fbdc/64 Scope:Link
UP BROADCA	AST 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:2	27620 (26.9 KiB) TX bytes:21874 (21.3 KiB)
lo Link encar	:Local Loopback
inet addr:	127.0.0.1 Mask:255.0.0.0
inet6 add	: ::1/128 Scope:Host
UP LOOPBAC	K 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:	0002 (8.7 KiB) TX bytes:9002 (8.7 KiB)
wlan0 Link encar	Ethernet HWaddr 78:4b:87:ea:a5:c7
UP BROADCA	AST 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:5	5172 (5.0 KiB) TX bytes:13381 (13.0 KiB)
root@imx6ull14x14ev}	::~# ping baidu.com
PING baidu.com (39.1	.56.66.10) 56(84) bytes of data.
64 bytes from 39.156	5.66.10 (39.156.66.10): icmp_seq=1 ttl=50 time=23.0 ms
64 bytes from 39.156	5.66.10 (39.156.66.10): icmp_seq=2 ttl=50 time=23.1 ms
wl_run_escan: LEGACY	SCAN sync ID: 3, bssidx: 0
64 bytes from 39.156	5.66.10 (39.156.66.10): icmp_seq=3 ttl=50 time=23.1 ms
64 bytes from 39.156	5.66.10 (39.156.66.10): icmp_seq=4 ttl=50 time=22.3 ms
^C	
baidu.com ping s	ptatistics
4 packets transmitte	d, 4 received, 0% packet loss, time 7040ms
rtt min/avg/max/mdev	v = 22.313/22.928/23.180/0.359 ms
root@imx6ull14x14ev	C: ~#

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 PPPO node and Ping Baidu

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	CT I
	6 12210 04108 32941
- L 	
root@imx6	1]]]14x14evk
root@imx6	11114x14evk ~# ifconfig
eth0	Link encap Ethernet HWaddir 56:a0:9e:37:86:e1
	inet6 addr: fe80::221b:b6e6:5cec:1274/64 Scope:Link
	RX packets:0 errors:0 dropped:0 overruns:0 frame:0
c /	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)
	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)
0qq0	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@imx60 PING baidu IPv6: ADD wl_run_esc wl_run_esc 64 bytes 64 bytes 64 bytes 64 bytes 64 bytes	All14x14evk: ~ + ping baidu.com 1.com (39.156.66.10) 56(84) bytes of data. RCONF(NETDEV_UP): wlan0: link is not ready can: LEGACY_SCAN sync ID: 9, bssidx: 0 can: LEGACY_SCAN sync ID: 10, bssidx: 0 from 39.156.66.10 (39.156.66.10): icmp_seq=1 ttl=52 time=53.8 ms from 39.156.66.10 (39.156.66.10): icmp_seq=2 ttl=52 time=155 ms from 39.156.66.10 (39.156.66.10): icmp_seq=3 ttl=52 time=59.4 ms from 39.156.66.10 (39.156.66.10): icmp_seq=4 ttl=52 time=48.5 ms from 39.156.66.10 (39.156.66.10): icmp_seq=5 ttl=52 time=48.5 ms

--- 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 f@imy6ull14v14evk.~*

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3.5 RTC

Terminal input command:

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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



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

← → C ☆ ▲ Not secure 192.168.1.120:8080/#/login		■ 10 ☆	* 🛛 🚺 🗄
🚱 京东 😸 百度一下 🏫 金亚太 项目/BUG 岁 在线翻译_有道 🤷 Goog	e 翻译 😮 MEGA 💿 linux yum 命令 莱 🔇 AT指令(中文详解 M Gmail 🖌 A	.pache JMeter - 下 🤌 《jmeter:葉萼入门	>>
	ChirpStack Login		
	ompolaek Login		
	Username / email *		
	Password*		
	LOGIN		

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3.6.2 Login and go to the Dashboard page $_{\circ}$

€	ChirpStack		٩	Search organization, application, gateway or device	? 🔒 admin
•	Dashboard Network-servers	Dashboard			
R	Gateway-profiles	Active devices	Active gateways	Device data-rate usage	
	Organizations	Neuroan Institu	Never seen Inorthe Arthe	080	
*	All users				
٩	API keys				
chirp	stack 👻				
ŧ	Org. dashboard				
+	Org. users				
٩	Org. API keys				
	Service-profiles	Gateways			
	Device-profiles	+			
R	Gateways	-			
	Applications				
2	Multicast-groups				

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".

€	ChirpStack	Q Search organization, application, gateway or device ? A adr
ŧ	Dashboard	Network-servers / Add
	Network-servers	Network-Servers / Aug
R	Gateway-profiles	GENERAL GATEWAY DISCOVERY TLS CERTIFICATES
₽	Organizations	Network-server name *
*	All users	lora-gateway
٩	API keys	A name to identify the network-server. Network-server server*
chirp	ostack 👻	Iocalhost:8000
ħ	Org. dashboard	
•	Org. users	
٩	Org. API keys	
	· · · · · · · · · · · · · · · · · · ·	

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.

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	ChilpStack		
		Service-profile name *	
ħ.	Dashboard	lora-server	
	Network-servers	A name to identify the service-prome.	
R	Gateway-profiles	Network-server * lora-gateway	*
	Organizations	The network-server on which this service-profile will be provisioned. After creating the service-profile, this value can't be changed.	
	All users	Add gateway meta-data	
		GW metadata (RSSI, SNR, GW geoloc., etc.) are added to the packet sent to the application-server.	
	API keys	Enable network geolocation	
chirp	stack 👻	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 ge	ateways supporting the
ł	Org. dashboard	time-timestamp feature and that the network-server needs to be configured in order to provide geolocation support.	
		Device-status request frequency 0	
*	org. users	Frequency to initiate an End-Device status request (request/day). Set to 0 to disable:	
5	Urg. API keys	Minimum allowed data-rate *	
ē.	Service-profiles	Minimum allowed data rate. Used for ADR.	
ŀ	Device-profiles	Maximum allowed data-rate *	
0	Gateways		
	Applications	Maximum allowed data rate. Used for ADR.	
	, pprioditerio	Private gateways	
		CRE	ATE SERVICE-PROFILE
=	ChirpStack	CRE Q Search organization, application, gateway or device	ATE SERVICE-PROFILE
≡ t	Chirp Stack Dashboard	CRE Q Search organization, application, gateway or device Service-profiles	ATE SERVICE-PROFILE
≓	ChirpStack Dashboard Network-servers	CRE Q Search organization, application, gateway or device Service-profiles	ATE SERVICE-PROFILE
= 1	ChirpStack Dashboard Network-servers Gateway-profiles	Q Search organization, application, gateway or device Service-profiles Note:	ATE SERVICE-PROFILE
= 1	ChirpStack Dashboard Network-servers Gateway-profiles Organizations	CRE Q Search organization, application, gateway or device Service-profiles Name Network Server	ATE SERVICE-PROFILE
= ((ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users	CRE Q Search organization, application, gateway or device Service-profiles Name Network Server Jora-server	ATE SERVICE-PROFILE
-	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users API keys	CRE Q Search organization, application, gateway or device Service-profiles Name Network Server Iora-server Rows per page: 10 +	ATE SERVICE-PROFILE
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≡ t l	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users API keys stack	CRE Q Search organization, application, gateway or device Service-profiles Name Network Server Iora-server Bows per page: 10 +	ATE SERVICE-PROFILE
≡ I	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users All keys Stack Truesce Org. dashboard Org. users	CRE © Search organization, application, gateway or device Service-profiles Name Network Server Iora-server Rows per page: 10 +	ATE SERVICE-PROFILE
irps	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users All users stack Org. dashboard Org. users	CRE Cere Cere Cere Cere Cere Cere Cere Cere Cere Cere Cere Cere Cere Cere Cere Cere Cere Cere Cere C	ATE SERVICE-PROFILE
=	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users API keys stack Org. dashboard Org. users Org. API keys	CRE CService-profiles Name Network Server Tora-server Rows per page: 10 *	ATE SERVICE-PROFILE
irps	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users API keys stack Org. dashboard Org. users Org. API keys Service-profiles	CRE	ATE SERVICE-PROFILE
=) I	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users All users API keys stack Org. dashboard Org. users Org. API keys Service-profiles Device-profiles	CRE Cereice-profiles Name Network Server Dora-server Rows per page: 10 *	ATE SERVICE-PROFILE
=	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users All users All keys Stack Org. dashboard Org. users Org. API keys Service-profiles Device-profiles Gateways	CRE CRE Comparison of the comp	ATE SERVICE-PROFILE
E hirps	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users All users All users Org. dashboard Org. users Org. API keys Service-profiles Gateways Applications	CRE CSErvice-profiles Name Network Server Iora-server Rows per page: 10 +	ATE SERVICE-PROFILE

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.

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	Chirp Stack وي		Q Search orga			? 😬 admin
ł	Dashboard	Device-profiles / Create				
220	Network-servers					
Ø	Gateway-profiles	GENERAL JOIN (OTAA / ABP)	CLASS-B	CLASS-C	CODEC	TAGS
3	Organizations	Device-profile name *				
	All users	lora-device				
	API keys	A name to identify the device-profile.				
chir	stack -	The network-server on which this device-profile will be provi	sioned. After creating the	device-profile, this value ca	n't be changed.	· · · · ·
ł	Org. dashboard	LoRaWAN MAC version * 1.0.2				-
	Org. users	The LoRaWAN MAC version supported by the device.				
i.	Org. API keys	LoRaWAN Regional Parameters revision *				•
=	Service-profiles	Revision of the Regional Parameters specification supported	d by the device.			
5	Device-profiles	ADR algorithm * Select ADR algorithm				
Ø	Gateways	The ADR algorithm that will be used for controlling the devic	e data-rate.			
	Applications	Max EIRP * 0				
١	Multicast-groups	Maximum EIRP supported by the device.				2
		Uplink interval (seconds) *				

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

€	ChirpStack		Q Search	organization, application	, gateway or device	? \varTheta admin
↑ ≣	Dashboard Network-servers	Device-profiles / lora-device				DELETE
@ =	Gateway-profiles Organizations All users	GENERAL JOIN (OTAA / ABP)	CLASS-B	CLASS-C	CODEC	TAGS
٩	API keys					UPDATE DEVICE-PROFILE
chirp	ostack 👻					
A	Org. dashboard					
:	Org. users					
٩	Org. API keys					
* =	Service-profiles					
畦	Device-profiles					
R	Gateways					
	Applications					
۳	Multicast-groups					

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)

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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":	9a45dcfffee31464",			
	/* change with	n detauli server address/p ss": "localbost"	orts */		
	"serv_port_up'	': 1700,			
	"serv_port_dow	vn": 1700,	the second second		
	<pre>/* adjust the "keepalive int</pre>	tollowing parameters for terval": 10.	your network */		
	"stat_interval	l": 30,			
	"push_timeout	_ms": 100, Iv valid packate */			
	"forward crc	valid": true,			
	"forward_crc_e	error": false,			
	"forward_crc_c /* GPS config	disabled": false, tration */			
	"gps_tty_path'	": "/dev/ttyS0",			
	/* GPS referen	nce coordinates */			
	"ref_longitude	e": 0.0,			
	"ref_altitude'	": 0,			
	/* Beaconing p	barameters */ d": 0.			
	"beacon_freq_h	nz": 869525000,			
	"beacon_datara	ate": 9,			
	"beacon power'	: 123000, ": 14,			
	"beacon_infode	esc": 0			
3,					
"de	ebug_conf": {				
	"ref_payload":	:[/CAFE1234"}			
	{"id": "0)	KCAFE12345"}			
],				
	tog_tite:: "	loragw_nal.log"			
3					
} (∈	ChirpStack			Q Search organization, application, gateway or device	edmin 2
} (∈ ♠	ChirpStack			Q Search organization, application, gateway or device	e edmin
}	ChirpStack Dashboard Network-servers	Gateways / Create		Q . Search organization, application, gateway or device	e edmin
} € ↑ ₩ ₩	ChirpStack Dashboard Network-servers Gateway-profiles	Gateways / Create	METADATA	Q. Search organization, application, gateway or device	e e admin
; ← 	ChirpStack Dashboard Network-servers Gateway-profiles Organizations	Gateways / Create	метарата	Q. Search organization, application, gateway or device	e edmin
; € # @ #	ChirpStack Deshboard Network-servers Gateway-profiles Organizations All users	Gateways / Create	метарата	Q. Search organization, application, gateway or device	e edmin
; € * : : : : :	ChirpStack Deshboard Network-servers Gateway-profiles Organizations All users API keys	Gateways / Create GENERAL TAGS Gateway name* Gragateway The name may only contain words, numbers and dashes.	метарата	Q Search organization, application, gateway or device	e e admin
€ ↑ Ⅲ ∞ Ⅲ • • • •	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users API keys stack	Gateways / Create	метадата	Q Search organization, application, gateway or device	e edmin
€ ↑ © L chirp	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users API keys stack v	Centerways / Create	METADATA	Q Search organization, application, gateway or device	e edmin

ft.	Org. dashboard			
<u>*</u>	Org. users	Gateway D * 9a 45 dc ff fe e3 14 64	MSB	G
9	Org. API keys	Network-server *		
. ≡	Service-profiles	lora-gateway Select the network-server to which the gateway will connect. When no network-servers are available in the dropdown, make sure a service-profile exists for this organization.		¥
	Device-profiles	Service-profile Jora-server		•
R	Gateways	Select the service-profile under which the gateway must be added. The available service-profiles depend on the selected network-server, which must be selected first.		
	Applications	Gateway-profile Select gateway-profile		•
2	Multicast-groups	Optional. When assigning a gateway-profile to the gateway, ChipStack Network Server will attempt to update the gateway according to the gateway-profile. Note that this does require a gateway with ChipStack Docentratord.		
		Gateway discovery enabled		
		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) *		

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.

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∉ (ChirpStack	Q Search organization, application, gateway or device	? 🔒 adr
A C	Dashboard	Applications / Create	
١	Network-servers	Applications / Greate	
R 6	Gateway-profiles	Application name *	
. (Organizations	terminal	
4	All users	The name may only contain words, numbers and dashes.	
<u>ہ</u>	API keys	test	
chirpsta	ack 👻	Service-profile * Iora-server	3
	Drg. dashboard	The service-profile to which this application will be attached. Note that you can't change this value after the application has been created.	
	Org. users		REATE APPLICATION
	Drg. API keys		
E 5	Service-profiles		
E C	Device-profiles		
0	Gateways		
. 4	Applications		
N N	Multicast-groups		

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 EUI**" and "**Application key**".

	ChirpStack		Q Search organization	n, application, gateway or device	e admin
^	Dashboard Network-servers	Applications			+ CREATE
@ #	Gateway-profiles Organizations	ID Name	Service-profile	Description	
• •	All users API keys	2 terminal	lora-server	test Rows per page: 10 ∓ 1-1 of 1	< >
chirp	Org. dashboard				
*	Org. users				
_= _=	Service-profiles				
₩ ®	Gateways				
<i>ا</i>	Applications Multicast-groups				

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				rorganization, approatio	n, galeway of device	
Dashboard						
Network-servers	Applications / to					
Gateway-profiles	DEVICES	APPLICATION CONFIG	URATION INTEGRA	TIONS		
Organizations		_				
All users						+ CREA
API keys	Last seen	Device name	Device EIII	Device profile	Link margin	Battery
stack 👻		beneenane		Derive prenie	10	
Org. dashboard				r.	owsperpage. 10 👻	
Org. users						
Org. API keys						
Service-profiles						
Device-profiles						
Gateways						
Applications						
Multicast-groups						
	Dashboard Network-servers Gateway-profiles Organizations All users API keys ttack Org. dashboard Org. aPI keys Service-profiles Device-profiles Gateways Applications Multicast-groups	Dashboard Applications / te Network-servers DEVICES Gateway-profiles DEVICES Org. dashboard Last seen Org. API keys Comparison Service-profiles Device-profiles Device-profiles Gateways Applications Multicast-groups	Dashboard Network-servers Gateway-profiles Organizations All users API keys ttack Org. dashboard Org. API keys Service-profiles Device-profiles Gateways Applications	Dashboard Network-servers Gateway-profiles Organizations All users API keys tack Org. dashboard Org. API keys Service-profiles Device-profiles Gateways Applications	Dashboard Network-servers Gateway-profiles Devices APPLICATION CONFIGURATION Integrations All users API keys tack Org. dashboard Org. API keys Service-profiles Device-profiles Gateways Applications	Dashboard Network-servers Gateway-profiles Devices APLICATION CONFIGURATION Integrations APL keys APL keys Org. dashboard Org. API keys Service-profiles Gateways Applications Applications Applications Multicast-groups

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.

æ	ChirpStack	Q Search organization, application, gateway or device	? 👌 admin
•	Dashboard Network-servers	Applications / terminal / Devices / Create	
* #	Gateway-profiles Organizations All users API keys	GENERAL VARIABLES TAGS Device name * Iora_scan Inte name may only contain words, numbers and dashes.	
chirr	ostack 👻 Org. dashboard Org. users	geniatech Device EUI * 35 34 35 31 75 37 59 0Å Device-profile *	MSB C
∢ ∎ #	Org. API keys Service-profiles Device-profiles	Iora-device Disable frame-counter validation Note that disabiling the frame-counter validation will compromise security as it enables people to perform replay-attacks.	
چ اللہ ا	Gateways Applications Multicast-groups	Uverice is disabled ChirpStack Network Server will ignore received uplink frames and join-requests from disabled devices.	CREATE DEVICE



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

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	ChirpStack			Q Sea	rch organization, applica	tion, gateway or device	e e e e e e e e e e e e e e e e e e e
^	Dashboard Network-servers	Applications / to	erminal / Devices /	' lora_scan			DELETE
R	Gateway-profiles	DETAILS	CONFIGURATION	KEYS (OTAA)	ACTIVATION	DEVICE DATA	LORAWAN FRAMES
₽	Organizations						
•	All users	Application key *	7 f1 f8 b4 60 21 c8 03 62	2.07			MSB C D
9	API keys	For LoRaWAN 1.0 devic	es. In case your device suppor	ts LoRaWAN 1.1, update	the device-profile first.		
chir	ostack 👻						SET DEVICE-KEYS
A	Org. dashboard						
:	Org. users						
٩	Org. API keys						
	Service-profiles						
	Device-profiles						
R	Gateways						
	Applications						
٣	Multicast-groups						
<=	ChirpStack			Q Searc	h organization, applicatio	n, gateway or device	? 😝 admin
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<	ChirpStack	Applications / te	rminal / Devices /	Q Searc	h organization, applicatio	n, gateway or device	admin
¢	ChirpStack	Applications / te	rminal / Devices /	Q Searc	h organization, applicatio	in, gateway or device	e admin DELETE
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¢	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users	Applications / te DETAILS	CONFIGURATION	Q Searc	h organization, applicatio ACTIVATION	n, gateway or device DEVICE DATA	e admin DELETE
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	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users API keys	Applications / ter DETAILS Details Name	rminal / Devices / CONFIGURATION	Q Search lora_scan KEYS (OTAA)	ACTIVATION Status Last seen at	n, gateway or device	DELETE
	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users API keys stack	Applications / ter DETAILS Details Name Description	rminal / Devices / CONFIGURATION	Q Search lora_scan KEYS (OTAA)	ACTIVATION ACTIVATION Status Last seen at State	DEVICE DATA	enabled
← ■ ◎ ■ ■ • • • •	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users API keys stack Trg. dashboard	Applications / ter DETAILS Details Name Description Device-profile	rminal / Devices / CONFIGURATION Iora_sca geniated Iora-devi	Q Search lora_scan KEYS (OTAA) h ce	ACTIVATION ACTIVATION Last seen at State	n, gateway or device	e admin
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C → ■ ② ■ · · · · · · · · · · · · · · · · ·	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users API keys stack Org. dashboard Org. dashboard Org. API keys Service-profiles Device-profiles Gateways Anplications	Applications / ter DETAILS	rminal / Devices / CONFIGURATION lora_sca geniated lora-devi	Q Search	ACTIVATION ACTIVATION Status Last seen at State	n, galeway or device DEVICE DATA	ever enabled
C ← Ⅲ ◎ Ⅲ · • • • • • • • • ○ □ □ □ □	ChirpStack Dashboard Network-servers Gateway-profiles Organizations All users API keys stack Org. dashboard Org. users Org. API keys Service-profiles Device-profiles Gateways Applications Multicast-groups	Applications / ter DETAILS Details Name Description Device-profile	rminal / Devices / CONFIGURATION Iora_sca geniatec Iora-devi	Q Search	ACTIVATION ACTIVATION Status Last seen at State	DEVICE DATA	ever enabled

3.6.11 When you are done adding, click LORAWAN FRAMES.

Data Communication

1.UPLINL

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.

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	Applications / g	eniatech / Devic	ces / test0325			E	OELETE
	CONFIGURATION	KEYS (OTAA)	ACTIVAT	10N	LIVE DEVICE D	E LORAWA	N FRAMES
			0	HELP	11 PAUSE	AD	CLEAR
2	DOWNLINK	11:19:53 AM	UnconfirmedDataDown	009e61	lc3		Ŷ
	UPLINK	11:19:52 AM	ConfirmedDataUp	009e61	1c3		~

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.



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3.7.3 Terminal operation

Terminal output:

minicom -s

//Set the port number and baud rate

```
λθθθθ[configuration]θθθθθκ
 Filenames and paths
                          e
  File transfer protocols
                          8
 Serial port setup
                          ſ.W
 Modem and dialing
                          2
  Screen and keyboard
                          a
  Save setup as dfl
                          20
  Save setup as ..
                          C'W
  Exit
                          č
 Exit from Minicom
                          ų,
```

		00000000000000000000k
A - Serial Device	: /dev/ttyACM0	ş
3 - Lockfile Location	: /var/lock	Ę
C - Callin Program		
) - Callout Program		20
I - Bps/Par/Bits	: 115200 8N1	- J
7 - Hardware Flow Contro	l : No	20
G - Software Flow Contro	1 : No	2
		8
Change which setting?		٤
		0000000000000000000000
ξ Screen and keybo	ard E	
ξ Save setup as df	1 8	
Save setup as	2	
ξ Exit	ξ	
ξ Exit from Minico	m E	
µ0000000000000000000000000000000000000	8888888889	

3.7.4 After the setup is complete.

save setup as dfl

Exit

Enter the Receive Command window, which will display the data sent by the terminal.

For example, if you open the 232 COM port, enter any value (e.g. 11111) in the minicom interface, the 232 COM port will receive 11111; enter any value (e.g. 22222) in the 232 COM port, the serial port should receive 22222



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.

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3.8.3 Terminal operation:

Terminal output:

minicom -s //Set the port number and baud rate



λ.000000000000000000000000000000000000	000000000000000000000000000000000000000	ж
ξ A - Serial Device	: /dev/ttymxcl	25
ξ B - Lockfile Location	: /var/lock	25
ξ C - Callin Program	:	5
ξ D - Callout Program		25
ξ E - Bps/Par/Bits	: 115200 8N1	35
ξ F - Hardware Flow Control	: No	5
ξ G - Software Flow Control	: No	ξ
ξ		ξ
ξ Change which setting?	99 A the construction of the transformed to the transforme	ξ: 0
μ0000000000000000000000000000000000000	000000000000000000000000000000000000000	θφ
ξ Screen and keyboar	cd ξ b	
ξ Save setup as dfl	Ę	
ξ Save setup as	ξ	
ξ Exit	Ę	
ξ Exit from Minicom	ξ.	
µ0000000000000000000000000000000000000	9666666p	

3.8.4 After the setup is complete, the Enter the Receive Command window, which will display the data sent by the terminal. For example, if you open the 485 COM port, enter any value (e.g., 11111) in the minicom interface, the 485 COM port will receive 11111; enter any value (e.g., 22222) in the 485 COM port, the serial port should receive 22222

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Velcome to minicom 2.7.1

OPTIONS: I18n Compiled on Aug 12 2022, 02:20:03. Port /dev/ttymxc1, 02:32:16

Press CTRL-A Z for help on special keys

11111

💐 COM10:115200baud - Tera Term VT

File Edit Setup Control Window Help

22222

3.9 Relay&GPIO

3.9.1 Terminal input command: i2cset -f -y 1 0x20 0x02 0x00 b i2cset -f -y 1 0x20 0x06 0x00 b i2cset -f -y 1 0x20 0x06 0x01 b i2cset -f -y 1 0x20 0x06 0x02 b i2cset -f -y 1 0x20 0x06 0x04 b i2cset -f -y 1 0x20 0x06 0x08 b i2cset -f -y 1 0x20 0x06 0x10 b i2cset -f -y 1 0x20 0x06 0x20 b i2cset -f -y 1 0x20 0x06 0x40 b i2cset -f -y 1 0x20 0x06 0x80 b i2cset -f -y 1 0x20 0x06 0x80 b

//All bytes are low, multimeter measures 0V //The 0th byte is pulled high and measured around 3.3V by multimeter //The 1th byte is pulled high and measured around 3.3V by multimeter //The 2th byte is pulled high and measured around 3.3V by multimeter //The 3th byte is pulled high and measured around 3.3V by multimeter //The 4th byte is pulled high and measured around 3.3V by multimeter //The 5th byte is pulled high and measured around 3.3V by multimeter //The 5th byte is pulled high and measured around 3.3V by multimeter //The 6th byte is pulled high and measured around 3.3V by multimeter //The 7th byte is pulled high and measured around 3.3V by multimeter //All bytes are high, multimeter measures 3.3V

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



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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@imx6ull14x	14evk:	~ #			
root@imx6ull14x	14evk:	~# df	-h		
Filesystem	Size	Used	Avail	Use €	Mounted on
/dev/root	6.9G	888M	5.7G	14%	1
devtmpfs	85M	4.0K	85M	18	/dev
tmpfs	246M	0	246M	08	/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	38	/run/user/0
/dev/sda1	15G	56M	15G	18	/run/media/sda1
root@imx6ull14x	14evk:	-# 13	/run/i	nedia,	/sda1/
SStarOta.bin.gz root@imx6ull14x	Syst	em Vo.	lume In	nform	ation otaunpack test.mp4

3.11 TF Card

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



df -h //View TF card mount path



root@1mx6u1114x	14evk:	~ # QI	-n		
Filesystem	Size	Used	Avail	Use≹	Mounted on
/dev/root	6.9G	888M	5.7G	14%	1
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	18	/tmp
tmpfs	246M	672K	245M	18	/var/volatile
/dev/mmcblk3p1	16M	8.6M	7.5M	54%	/run/media/mmcblk3p1
tmpfs	50M	1.3M	48M	38	/run/user/0
dev/sda1	1.9G	32M	1.9G	28	/run/media/sda1
root@imx6ull14x abcd.iso root@imx6ull14x	14evk:	~# 13	/run/I	nedia,	/sdal/

3.12 Reboot

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



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mx6ull14x14evk login: XF 1.MX Release Distro 4.14-sumo imx6ull14x14evk ttymxc0 mx6ull14x14evk login: root ast login: Thu Jan 1 03:56:03 UTC 1970 on tty7 root8jmx6ull14x14evk:-# root8jmx6ull14x14evk:root8jmx6ull14x14evkevk:roo