

How to Register a LoRa Node with RAK Gateway built-in LoRaServer?

This document is used to guide users to register a LoRa node with RAK LoRa gateway built-in LoRaServer.

If you want to use RAK cloud LoRaServer, please have a look at another document: <u>https://downloads.rakwireless.com/en/LoRa/LoRa-Server-Cloud/Guide/How_to_use_RA</u> <u>K cloud_LoRaServer_for_testing.pdf</u>

OK, let's get start!

Open the web page of the built-in LoRaServer. The link is "Gateway IP:8080".

€	DoRaServer			Q Search organizatio	on, application, gataway or device	?	e admin
	Network-servers	Applications					CREATE
R	Gateway-profiles	Applications					CREATE
H	Organizations	ID	Name	Service-profile	Description		
-	All users	1	AppModel	ServiceProfileMadel	AppModel		
loras	erver 👻				Rows per page: 10 - 1-1 of 1		,
۵	Org. settings				100 p. 200	_	
*	Org. users						
±≡.	Service-profiles						
	Device-profiles						
R	Gateways						
	Applications						
2	Multicast-groups						

By default, there is already one or more items in this page, you can use it or create a new item. Now, let's create a new item by click the "CREATE" button, and fill in them.

€	C LoRaServer	Q. Search organization, application, gateway or device	9 0	admin
*	Network-servers Gateway-profiles	Applications / Create		
В	Organizations	Application name *		
*	All users	The name may only contain words, numbers and daebes.		-
loras	erver 👻	Application description *		
ф	Org. settings	Service potifie *		_
*	Org. users	Select service-profile		*
. ≡	Service-profiles	та дила сулата за класта и укранирата на клашичностаки в на рок онт снатре настако вто на круповот на контиско. Рауход code:		
	Device-profiles	None Production and and a 1-0% from Process are sended and denote the binner device and and for our		•
R	Gateways	ру опыті ў арауына чоле, кана нур энтик кат нікахоле на санаў цепке раўная по ука.		
ш	Applications	CREATE	APPLICATI	ON
2	Multicast-groups			

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€	DeRa Server	Q. Search organization, application, gateway or device 🕜 😝 admin	
	Network-servers Gateway-profiles	Applications / Create	
•	Organizations All users	Application nume * RAK7200_test The name may only contain works, numbers and dathes.	
loras	erver *	Application description * This application is used to test RAK7200	
\$ •	Org. settings Org. users	ServiceProfile* ServiceProfileModel	
≟ ≡	Service-profiles	The service-profile to which this application will be attached. Note that you can't change this value after the application has been created. Pagload code: Cayenne LPP	
₩ ®	Gateways	By defining a payload codec. LoRa Agp Server can encode and decode the binary device payload for you.	
ш	Applications	CREATE APPLICATION	
2	Multicast-groups		

"CREATE APPLICATION".

	C LoRaServer					?	e	admin
	Network-servers Gateway-profiles	Applications					+ 0	REATE
	Organizations	D	Name	Service-profile	Description			
•	All users	1	AppModel	ServiceProfileModel	AppModel			
loras	erver +	2	RAK7200_test	ServiceProfileModel	This application is used to test RAK7200			
۵	Org. settings				Rows per page: 10 -	1-2 of 2	<	>
•	Org. users							
å≡	Service-profiles							
	Device-profiles							
R	Gateways							
	Applications							
2	Multicast-groups							

Click the new item name "RAK7200_test":

€	DoRaServer				Q Search organization, application, gateway or device	6	9 8	admin
N	Network-servers Gateway-profiles Organizations	Applications / R	APPLICATION CONFIGURATION INTEGRAT	IONS			i (DELETE
•	All users	-	-				+ 0	CREATE
loras	server -							
\$	Org. settings	Last seen	Device name	Device EUI	Link margin	Battery		
<u>*</u>	Org. users				Rows per page: 10 🛩	0-0 of 0	<	>
±=	Service-profiles							
	Device-profiles							
R	Gateways							
ш	Applications							
2	Multicast-groups							

Add a LoRa node device into LoRaServer by clicking the "CREATE" button:



€	DoRaServer		Q Search organization, application, gateway or device	edmin
II @ I	Network-servers Gateway-profiles	Applications / RAK7200_test		DELETE
Loras	All users			+ CREATE
* · · · · · · · · · · · · · · · · · · ·	Org. settings Org. users Service-profiles Device-profiles Gateways Applications Multicast-groups	Last een Device EU	Link margin Rows per page: 10 •	Battery
€	C LoRaServer		Q Search organization, application, gateway or device	? 🖯 admin
) () () () () () () () () () () () () ()	Network-servers Gateway-profiles Organizations All users	Applications / RAK7200_test / Devices / Create	Q Search organization, application, gateway or device	e edmin
Contraction of the second seco	Network-servers Gateway-profiles Organizations All users server Org. settings	Applications / RAK7200_test / Devices / Create Device name * The name may only contain words, numbers and dashes. Device description *	Q Search organization, application, gateway or device	e edmin
	Correstings Org. settings Org. settings Proj. settings Pro	Applications / RAK7200_test / Devices / Create Device name * The name may only contain words, numbers and dashes: Device description * Device EUI * Device EUI * Device Profile	Q Search organization, application, gateway or device	A admin MSB C
 <	Network-servers Gateway-profiles Organizations All users Server Org. settings Org. users Service-profiles Device-profiles Gateways Applications	Applications / RAK7200_test / Devices / Create Device name * The name may only contain words, numbers and dashes: Device description * Device EUI * Device Porfile Device profile Disable frame-counter validation Met that disabling the frame-counter validation will compromise security as it entables people to perform replay straction.	Q Search organization, application, gateway or device	MSB C

Fill in them. You can generate a Device EUI automatically by click the following icon, or you can write a correct Device EUI in the edit box.

Æ		Q Search organization, application, gateway or device	0	θ	test001
test001 👻					
<u>+</u>	Org. users	Applications / app-001 / Devices / Create			
≟ ≣	Service-profiles	Device name *			
백	Device-profiles	RAK7200 test The name may only contain words, numbers and dashes.			
\bigcirc	Gateways	Device description*			
ш	Applications	the first RAK7200 to test			_
2	Multicast-groups	Devce EUI * 85 ad da b5 11 19 d9 cb	MS	в	C
		Device-profile* Device-profile			
		DeviceProfile_ABP			
		DeviceProfile_OTAA			
			CREA	TE DE	VICE

Note: If you want to join in OTAA mode, you should select "**DeviceProfile_OTAA**" in the "Device-profile" item. If you want to join in ABP mode and other frequencies except AS923 and CN470, you should select "**DeviceProfile_ABP**" in the "Device-profile" item. What about AS923 in ABP mode? Sorry! LoRaServer can not support it now.

5.1 Register a LoRa node in OTAA mode

If you select "DeviceProfile_OTAA", it means you want to join LoRaServer in OTAA mode.



æ	C LoRaServer	Q. Search organization, application, gateway of device	0	8	admin
	Network-servers	Applications / PAK7200 test / Davises / Create			
\bigcirc	Gateway-profiles	Applications / Refer 200_test / Denoes / Order			
•	Organizations All users	Divicion nume * RAK7200_test1 The nume may only contain words, numbers and dashes.			_
loras	erver 👻	Device description * the first RAK7200 to test			
*	Org. settings Org. users	Device EUX* 74 4d 44 52 dd 39 03 7c	MSI	в	C
±≡	Service-profiles	Device-profile_0 Device-Profile_0TAA			
뮲	Device-profiles				
R	Gateways	Disable frame-counter validation			
ш	Applications	Note that disabling the frame-counter validation will compromise security as it enables people to perform replay-attacks.			
2	Multicast-groups		CREAT	TE DE	/ICE

"CREATE DEVICE". Then generate the application key in this page. You can write it by yourself or generate it automatically by clicking the following icon:

€	DoRaServer	Q. Search organization, application, gateway or device	? \varTheta admin
	Network-servers Gateway-profiles Organizations	Applications / RAK7200_test / Devices / RAK7200_test1 configuration Live device data Live Lorawan Frames	DELETE
*	All users		-
loras	erver 👻	Application key (LoRaWAN 1.0) *	MSB C 🗞
\$	Org. settings	For LoRaWAN 1.0 devices, this is the only key you need to set. In case your device supports LoRaWAN 1.1, update the device profile first.	
<u>.</u>	Org. users		SET DEVICE-KEYS
.≜≡	Service-profiles		
쿺놑	Device-profiles		
R	Gateways		
ш	Applications		
2	Multicast-groups		
€	DoRaServer	Q. Search organization, application, gateway or device	? 🖯 admin
	Network-servers	Annications / RAK7200 test / Devices / RAK7200 test1	T DELETE
R	Gateway-profiles		
	Organizations	CONFIGURATION KEYS (OTAA) ACTIVATION LIVE DEVICE DATA LIVE LORAWAN FRAMES	
<u>*</u>	All users		
loras	server 👻	Application key (LoRaniAu 1.0) * b3 7a 45 35 8f 6d ed 58 6c 22 06 38 4f 1c 9a 42	MSB C 🔞
\$	Org. settings	For LoRaWAN 1.0 devices, this is the only keyyourneed to set. In case your device supports LoRaWAN 1.1, update the device-profile first.	
•	Org. users		SET DEVICE-KEYS
≛ ≣	Service-profiles		
백	Device-profiles		
R	Gateways		
	Applications		
2	Multicast-groups		

"SET DEVICE-KEYS". That's OK! You've complete the configuration on LoRaServer. As you see, the Device EUI which will be set into your LoRa node as "dev_eui" is this one:

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∉	DoRaServer				${f Q}$ Search organization, application, gateway or device	G	Θ	adm
	Network-servers	Applications / I	RAK7200 test				1 D	
R	Gateway-profiles	Applications 7	RAR/200_lest					
	Organizations	DEVICES	APPLICATION CONFIGURATION INTE	GRATIONS				
•	All users						+ cr	REATE
lora	server 👻							
1	Org. settings	Last seen	Device name	Device EUI	Link margin	Battery		
•	Org. users	n/a	RAK7200_test1	744d4452dd39037c	n/a	n/a		
,≡	Service-profiles				Rows per page: 10 -	1-1 of 1	<	>
11	Device-profiles							_
R	Gateways							
	Applications							
2	Multicast-groups							

The Application Key which will be set into your LoRa node as "app_key" is this one:

€	DoRaServer				e admin
C2000 C2000 C2000	Network-servers	Applications / RAK7200_test / Devices / RAK7200_test1			DELETE
R	Gateway-profiles	[20] T. Perenditari and S. Mahada and P. Carrier, Phys. Rev. B (1994) 113 (1995).			
	Organizations	CONFIGURATION KEYS (OTAA) ACTIVATION LIVE DEVICE DATA LIVE LORAWAN FRAMES			
<u>+</u>	All users				
lora	server 👻	Acceleration level in debits M 1 10 + b3 7a 45 35 8f 6d ed 58 6c 22 06 38 4f 1c 9a 42	MSB	C	Ø
۵	Org. settings	For LoRaWAN 1.0 devices, this is the only key you need to set. In case your device supports LoRaWAN 1.1. update the device profile first.			
<u>+</u>	Org. users		SET	DEVIC	E-KEYS
å≣	Service-profiles				
	Device-profiles				
R	Gateways				
ш	Applications				
2	Multicast-groups				

The Application EUI which will be set into your LoRa node as "app_eui" is useless for LoRaServer, and you can set it to any value with a correct format, for example: 7083D57ED001C1CF.

5.2 Register a LoRa node in ABP mode

If you select "DeviceProfile_ABP" or "DeviceProfile_ABP_CN470", it means you want to join LoRaServer in OTAA mode.

€	DoRaServer	Q. Search organization, application, gateway or device	? \varTheta admin
	Network-servers Gateway-profiles	Applications / RAK7200_test / Devices / RAK7200_test1	DELETE
llto	Organizations	CONFIGURATION KEYS (0TAA) ACTIVATION LIVE DEVICE DATA LIVE LORAWAN FRAMES	
*	All users		
loras	server 👻	Desice name* RAK7200_test1	
4	Org. settings	The name may only contain words, numbers and doubles. Device description *	
*	Org. users	the first RAK7200 to test	
#≡	Service-profiles	Devceptofile* DeviceProfile ABP	
荘	Device-profiles		
R	Gateways	Disable frame-counter validation	
	Applications	Note that disabiling the frame-counter validation will compromise security as it enables people to perform replay-attacks.	
2	Multicast-groups		UPDATE DEVICE

Then you can see that there are some parameters for ABP in the "ACTIVATION" item:



∉	DoRaServer	Q. Search organization, application, gateway or device	? Ə admin
■ ©	Network-servers Gateway-profiles Organizations	Applications / RAK7200_test / Devices / RAK7200_test1 configuration KEYS (0TAA) Activation Live Device Data Live Loranian Frames	DELETE
•	All users		
loras	erver 👻	Dexter address * 01 9c 82 0a	MSB C
\$	Org. settings	National session key (LoBaWM 1.0) *	o
*	Org. users	Accilication session key LoRayVAN 1.0.*	
≟ ≣	Service-profiles		ø
驻	Device-profiles	Uplink frame-counter *	
R	Gateways	26	
ш	Applications	Downlink frame-counter (network) * 1	
2	Multicast-groups		(RE)ACTIVATE DEVICE

Next, let's use these parameters to set your LoRa node by using AT command.

€	C LoRaServer				Q Search orga	nization, application	, gateway or device	? 8	admin
	Network-servers Gateway-profiles Organizations	Applications / App / DETAILS	Devices / DevicePricePrice	OFILE_OTAA KEYS (OTAA)	ACTIVATION	DEVICE DATA	LORAWAN FRAMES	FIRMWARE	elete
loras	All users	Details			Status				
\$	Org. settings	Name	DeviceProfile	_OTAA	Last seer	at	nev	2F	
•	Org. users	Description	qeweww						
.≜≡	Service-profiles	Device-profile	DeviceProfile	Otaa					
11	Device-profiles								
\mathbb{R}	Gateways								
ш	Applications								
2	Multicast-groups								

Finally, if your LoRa node has joined successfully, you can check the status here:

Or you can see the LoRa frames sending from LoRa node in this page:

	LoRa Server	Q. Search organization, application, gateway or device 🕑 e admin
	Network-servers Gateway-profiles	Applications / App / Devices / DeviceProfile_OTAA
	Organizations	DETAILS CONFIGURATION KEYS (OTAA) ACTIVATION DEVICE DATA LORAWAN FRAMES FIRMWARE
•	All users	⑦ HELP II PAUSE ★ DOWNLOAD ■ CLEAR
loras	erver 👻	
\$	Org. settings	
<u>.</u>	Org. users	
≟ ≡	Service-profiles	
	Device-profiles	
\bigcirc	Gateways	
ш	Applications	
2	Multicast-groups	

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