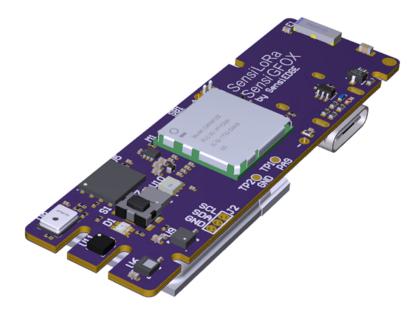


# SensiLoRa 2.0 Getting Started



## Getting started with SensiLoRa 2.0

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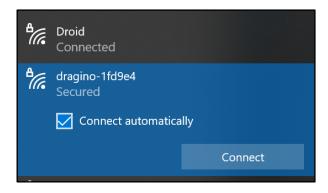


# 1 Config Dragino Pico Station

1.1 Connect to Dragino

1. Connect the antenna, and network cable and turn on the device. After starting the device, it should be defined on the Wi-Fi network as " **dragino-xxxxxx** " (Figure 1). When the device is found, we connect to it and enter the default password: "**dragino+dragino**".





2. When connected to the device, open the browser and enter the address: <u>http://10.130.1.1/</u> and enter (Figure 2):

User Name: root

Password: dragino

Figure 2. Site





3. Go to network settings LoRa (Figure 3).



## Figure 3. Go to LoRa settings

## 1.2 Configuration LoRa

1. In LoRa Configuration select the desired frequency (EU868 or US915) and click on **Save&Apply** (Figure 4).

## Figure 4. Configuration Lora

5 DRAGINO	LoRa <del>-</del>	LoRaWAN <del>-</del>	MQTT 🗸	TCP 🔫	Custom	Network -	System <del>-</del>	LogRead <del>~</del>	Home	Logout
LoRa Configu	ration									
Debug Leve	I	Low	~							
Radio Settings										
Keep Alive Pe Frequency Pla		30 EU868 Europe	368Mhz (863~87	70)						
Static GPS cool	dinates 🕯	?								
Enable Stati Latitude	C GPS	□ 22.700000			ude (m) gitude	450 114.240000				
Current Mode:LORi	aWAN Sem isable Canc									



## 1.3 Configuration LORIOT

## 1. Go to configuration **LORIOT** (Figure 5).

#### Figure 5. Go to Loriot's settings

S dragino LoRa Gateway 🗙	+								0	- 6	I	×
← → C ▲ Not secure   10.13	0.1.1/cgi-bin/lora-lora	a.has								☆	-	:
	LoRaWAN 🗸	MQTT 🗸	TCP 🔻	Custom	Network -	System 🗸	LogRead <del>▼</del>	Home	Logout			
LoRa Configuration	LoRaWAN											
Debug Louel	Amazon AW	S loT										
Debug Level	LORIOT <	$\leq$										
Radio Settings												
Keep Alive Period (sec)	30											
Frequency Plan	EU868 Europe 8	68Mhz (863~87	0)		$\checkmark$							
Static GPS coordinates	?											
Enable Static GPS				ude (m)	450							
Latitude	22.700000		Lon	gitude	114.240000							
Current Mode:LoRaWAN Serr Save&Apply Disable Cano												

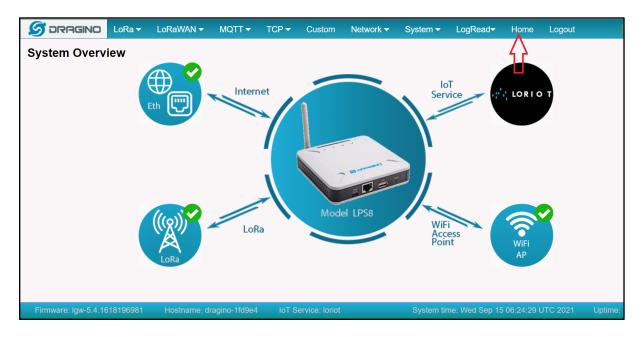
2. In the LORIOT configuration, select the desired server (example: **Amsterdam - eu2.loriot.io**) and click on **Save&Apply** (Figure 6).

#### Figure 6. Configuration Loriot

S DRAGINO	LoRa 🔻	LoRaWAN 🔻	MQTT 🗸	TCP 🔻	Custom	Network -	System 🔻	LogRead <del>▼</del>	Home	Logout
LORIOT Client	t Config	uration								
Server Addre	SS	Amsterdam - eu2.lor	ot.io 🗸 <	Serv	er Port	1700				
Client Certific	cate		~	Clier	nt Key		~			
CA File			~							
eth0 MAC Ad	ldress: A8	:40:41:1F:D9:E7								
Certificate Ma	<u>anagement</u>									
Current Mode: LoR Save&Apply Cance		ntech UDP Click	Save & Apply	will change	to mode :Lo	RIOT				
Ŷ										



3. After configuring the LORIOT, go to the <u>Home</u> tab and see green checkmarks as in the picture. This means that everything is working (Figure 7).



#### Figure 7. Home page



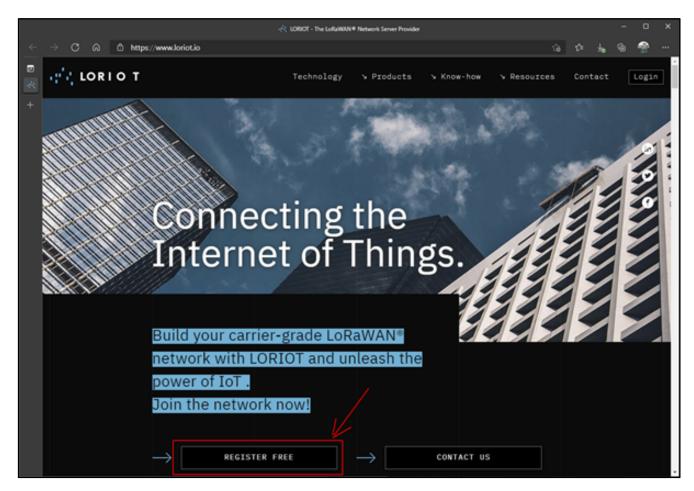
# 2 Registration in LORIOT

## 2.1 Registration in Server

1. Go to https://www.loriot.io/ and press REGISTER FREE (Figure

8).

## Figure 8. LORIOT site





## 2. Select server EU2 Amsterdam, Netherlands (Figure 9).

$= \partial_t^2 \partial_t^2 \Phi$	ORIO T			Technology	∿ Products → Kr	ow-how	≫ Resources	Contact Login
								$\dot{\cdot}$
		EMEA		ASIA	/ PACIFIC		AME	RICAS
	SERVER			SERVER	LOCATION		SERVER	LOCATION
	EU4PRO	Amsterdam, Netherlands	(:	AP4PR0	<u>Singapore</u>		US3PR0	<u>Oregon City, USA</u>
	EU1	<u>Frankfurt</u> , Germany		AU2PR0	<u>Sydney, Australia</u>		US1	<u>California, USA</u>
	EU2	<u>Amsterdam, Netherlands</u>	*	IL1	new! Israel new!		US2	<u>New York, USA</u>
2	EU3	<u>Madrid, Spain</u>	<b>(</b> ::	AP1	<u>Singapore</u>		SA1	<u>Sao Paulo, Brazil</u>
NK	UK1	London, United Kingdom	*	AU1	<u>Sydney, Australia</u>			

## Figure 9. Select server

3. Input all data and press the button **CREATE A FREE ACCOUNT** (Figure 10).

## Figure 10. Create account

			🗟 Network Se	ver   LORIOT.io							
	c	https://eu1.loriot.io	a/register		© 18	ŵ	*		-		
E * +	FRE	E ACCOUNT REG	ISTRATION	REGISTRATION FOR	м					ĺ	
	Upon	registration, you will be able	to connect your LoRa gateway to our	First Name	Last Name						
	netwo frame	., ,	nd-nodes and retrieve your data	First Name	Last Name					- 1	
		24		Country	E-Mail	E-Mail					
	FRE	ACCOUNT INCLUDE	s	Ukraine 👻	E-Mail address	E-Mail address					
	* 0	ne free Gateway Connectivity	* Existing devices can be	Password	Password must con	tain at le	ast			- 1	
	slot		imported into our system	Password	One upper and lo One number	wer-cas	e charact	er		. 1	
	<b>*</b> 0	ne Free Network Application	★ Existing gateways can be		One special chara 8 characters	cter				- 1	
	<b>*</b> C	apacity of 10 devices	migrated to our system	I agree with Terms of Service						- 1	
	NE	ED MORE?	ALREADY HAVE AN ACCOUNT?	CREATE A FI	REE ACCOUNT						



4. After confirmation via email enter the site (Figure 11).

Figure 11. Login to server

				dit to	gin   LORIOT					
	С	٥	https://eu1.loriot.io/login				τê	*	-	
۵										
44										
+										
					LORIO T					
					Email					
				· · · · · ·	Password					
					Log In					
				Reset password	Register a new account					
					Impressum					

2.2 Register a gateway (Dragino LPS8)

1. Go to the <u>Networks</u> page (Figure 12).

Figure 12. Go to Networks

LORIO T	■ Q Search				
Dashboard					
Applications	Charts			^	Recent Alerts
X Networks	Gateways	Devices <b>0</b>	Uplinks / Downlinks 🕄	Join Request / Join Accept	
√ Join Servers					
🛃 Account	No data	No data	No data	No data	
📦 Upgrade					
🌲 Alerts	<ul> <li>Online</li> <li>Offline</li> </ul>	<ul> <li>Active</li> <li>Inactive</li> <li>Never seen</li> </ul>	Uplinks Downlinks	● Join Request ● Join Accept	
	▲ Gateways				
Alerts	• Online • Offline	● Active ● Inactive ● Never seen	Uplinks      Oplinks     Op	Join Request Soin Accept	



## 1. Go to the **Sample network** (Figure 13).

#### Figure 13. Choose the Sample network

LORIO T	≡ Q Search
← Back to Dashboard	
🗙 networks	LoRaWAN <sup>®</sup> Networks
+ New Network	Network ID 🤍 🕼 Name 🔍 🕴 Gateways 👫 Org. User Access 🌱 👫 Ownership 👫 Country 👫 City
	A0000721 Sample network 1 Disabled Owned by you

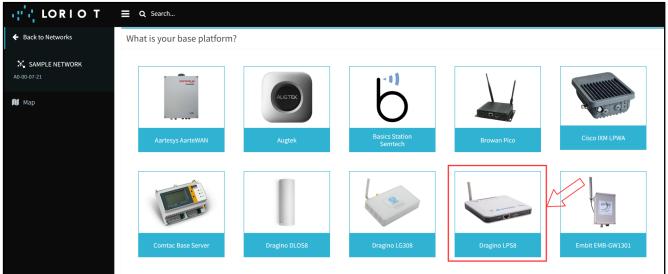
1. Add Gateway. Press the button <u>Add Gateway</u> (Figure 14).

## Figure 14. Add gateway

LORIO T	<b>Q</b> Search									
← Back to Networks										
K SAMPLE NETWORK	Sample netwo	rk	Organization User A	ccess						
🛍 Мар	10/24/24, 6:58 AM Network ID A0000721 + Add Gateway Gateways	Configure ▼	Disabled 🖲 Network Organizati 158f3640-7010-4d17-							
	Name	् ↓≣ GW	/EUI ⊂.↓†	МАС	Q <b>1</b> 1	Model	1ţ	Version	Q.↓†	Status
						0 Gateways				
	4								_	



## 2. Scroll down and select **Dragino LPS8** (Figure 15).



## Figure 15. Add the Dragino LPS8

3. Scroll a little below and you will see a field for entering the device address (Figure 14). If a Dragoni LPS8 is used, the Eth0 Mac address can be taken on a *web-based GUI Dragino website* in LORIOT Client Configuration <u>1.3 Configuration LORIOT</u> (Figure 16).

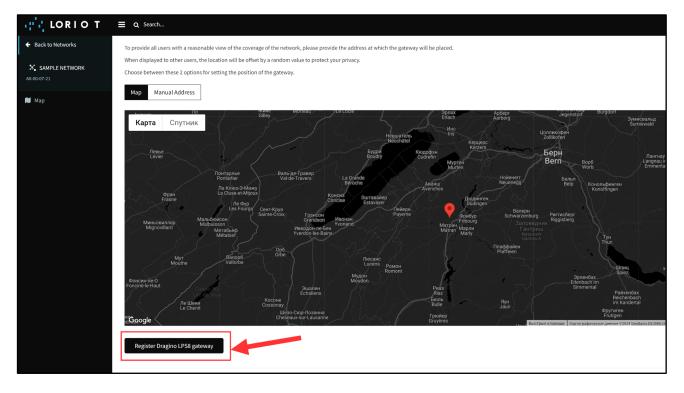
Figure 16. Eth0 Mac address

LORIO T	■ Q Search			S DRAGINO	LoRa 🔻	LoRaWAN <del>-</del>	MQTT 🔫 T					
<ul> <li>Back to Networks</li> </ul>	What is your base platform?			LORIOT Client Configuration								
SAMPLE NETWORK		Radio Front-end Bus	Dragino-LPS8 V	Server Addre		Amsterdam - eu2.lor	iot.io 🗸					
📜 Мар		Dragino LPS8 is fully supp	orted.	Client Certific	cate		~					
				CA File	_		~					
				eth0 MAC Ad	Idress: A8	:40:41:1F:D9:E7						
	Dragino LPS8			<u>Certificate M</u>	anagement							
	Choose a different base platform			Current Mode: OR Save&Apply Cance								
	MAC address of eth0 interface		COF	Pγ								
	The MAC Address of the Ethernet port can be queried by r	running										
	ifconfig eth0   grep HWaddr command from your device's console. A sample output w	vill be similar to										
	eth0 Link encap:Ethernet HWaddr AB:CD:EF:12:34:56											
	Copy and paste the highlighted part (six octets separated	by colons) from the output of	our device console to th									
	eth0 MAC address AB:CD:EF:12:34:56											
	Upon successful registration, we will provide you with a s	etup guide for your gateway ar	id a gateway binary with									



4. Scroll down and indicate the modem's location here, then click on **Register Dragino LPS8 gateway** (Figure 17).

## Figure 17. Register Gateway



5. After registering the gateway, a page with the gateway status will appear, and it will be written that the connection status is **Disconnected** (Figure 18).



IN LORIO T	≡ Q Search			
← Back to Sample network				
A8-40-41-FF-FF-1F-D9-E7	Gateway / A8-40-41-FF-FF-1F-D9-E7 🖌			
A8-40-41-FF-FF-1F-D9-E7		Status		
🐮 Devices Activity	1	The gateway has been offline this month.	<b>Latency</b> No Data	Last Conne Never
M Location	and a second sec		Last Keep Alive	Last Discon
🔟 Traffic			Never	Never
			Last Data Never	<b>Remote Tin</b> No Data
Radio			Never	No bata
🖿 Spectral Scan	Disconnected     Version 0.0.0	Details		
⊊ System		мас		Model
II GPS	Remove	A8:40:41:1F:D9:E7		LPS8
	Notos	EUI		Concentrator



6. To speed up the procedure for connecting the gateway to the server, you need to reboot the Gateway. Refresh the page and wait until the Gateway's status changes to connected (Figure 19).

Figure '	19.	Gateway	Connected
----------	-----	---------	-----------

LORIO T	≡ Q Search		
← Back to Sample network			
A8-40-41-FF-FF-1F-D9-E7	Gateway / A8-40-41-FF-FF-1F-D9-E7 🖌	Status	
😴 Devices Activity	1	The gateway has been offline this month.	<b>Latency</b> No Data
N Location	a second second	The gateway has been on the tins month.	Last Keep Alive 26 Oct 2024 11:49:23 (a minute ago)
<u>ய</u> Traffic			Last Data
Radio			Never
🖿 Spectral Scan	Connected Version 2.8.1483-DEV	Details	
≢ System		мас	
II GPS	Your version is <b>Out Of Date</b> , please update to the latest version	A8:40:41:1F:D9:E7	
🛓 Software	Update	<b>EUI</b> A8-40-41-FF-FF-1F-D9-E7	
₩ Log	Ping	<b>Base</b> Dragino	
🜲 Alerts	Tap into data stream	Machine	
	Restart	mips	
	Remove	Connected from IP 91.218.90.42	
	Notes	Kernel	

7. Go to the server's main page by clicking on the **LORIOT icon** (Figure 20).

#### Figure 20. Go to the main page

·	= Q Search			
← Back to Sample network				
À A8-40-41-FF-FF-1F-D9-E7	Gateway / A8-40-41-FF-FF-1F-D9-E7	1		
A8-40-41-FF-FF-1F-D9-E7			Status	
🐮 Devices Activity				Latency
			The gateway has been offline this month.	No Data
🔰 Location				Last Keep Alive
				26 Oct 2024 11:49:23 (a minute ago)
Ш. Traffic	7			Last Data
🏟 Radio				Never
📥 Spectral Scan	Connected	Version 2.8.1483-DEV	Details	
≢ System				
			MAC A8:40:41:1F:D9:E7	
I GPS			A0.40.41.11.03.L1	



## 2.3 Add a Device

1. To add the SensiLoRa 2.0 device, need **AppKey**, **JoinEui**, and **DevEui** keys. These keys can be found using the SensiConfigurator program, download: <u>Download SensiConfigurator Windows</u>. Use <u>the Getting Started SensiConfigurator</u> document in section <u>3.2 Device Information</u>.

## 2. Go to the Applications page (Figure 21).

Dashboard Applications	Charts			^	🜲 Recent A
Networks 1	ways (1)	Devices 🕄	Uplinks / Downlinks 🕄	Join Request / Join Accept	
Join Servers					
Account		No data	No data	No data	
Upgrade					
Alerts	<ul> <li>Online</li> <li>Offline</li> </ul>	<ul> <li>Active</li> <li>Inactive</li> <li>Never seen</li> </ul>	Uplinks Downlinks	🔵 Join Request 🕘 Join Accept	
	▲ Gateways				
		e Show offline			
	<u></u>				

## Figure 21. Go to Applications

3. Choose a **Sample application** (Figure 22).

Figure 22. Choose a Sample application

HI LORIO T	≡ Q Search								
← Back to Dashboard									
	LoRaWAN <sup>®</sup> Applications								
+ New Application	Application ID Q IF Name Q If Devices If Max. Devices If Org. User Access 🌱								
및 Device Templates	BE010728         Sample application         0         30         Disabled								



## 3. Click on Enroll Device (Figure 23).

## Figure 23. Enroll Device

IN LORIO T	≡ q Search	
← Back to Applications	Application / Sample application	
BE-01-07-28	🖷 Details	ևով Traffic History
+ Enroll Device	Name Sample application	Daily Last 24 Hours
≣ Bulk Import	Applicate in BE010728	1.0 , Hourly Uplinks Count
Devices	Device Used Capacity	0.8

4. In the tab Enroll Device, enter any Name in <u>Title</u>, for example SensiLoRa 2.0 (step 1), then enter <u>Application key</u> (step 4), <u>Device EUI</u> (step 2), and <u>Join Eui</u> (step 3), (these keys can be found using the SensiConfigurator program, download: <u>Download SensiConfigurator Windows</u>. Use <u>Getting Started SensiConfigurator</u> document section <u>3.2 Device Information</u>). Click <u>Enroll</u> (step 5) (Figure 24).

#### Figure 24. Add device

■ Q Search		
Enroll a new device		
LoRaWAN® Version	Enrollment Process	·
LoRaWAN® 1.0.x	0TAA ~	Device Information ×
Location DISABLED ENABLED ENABLED Vou can define coordinates for static devices enabling this option.		Device Name: SensiLora 2.0 Firmware Version: 0.0.10 Lora Region: EU868 Battery: 100.0%
Details Title	Device EUI 2 Join EUI 3 DevEUI (16 hex matter) JoinEUI Lumex digits	Port: COM9         Copy           AppKey: 2B7E151628AED2A6ABF7158809CF4F3C         Copy           DevEui: 333737396C307116         Copy           JoinEui: 0101010101010101         Copy
Description	Application Key (4)	ОК
	APPKEY (32 hex digits)	
	Device Template	
	Create Another	
	Click	
Copyright © 2015 - 2023 LORIOT AG. All rights reserved.	606	



5. Go to the Devices page by clicking on the icon **<u>Back To Devices</u>** (Figure 25).

LORIO T	<b>Q</b> Search		
← Back to Devices	Device Details / 33	3737395E308C16	
• SENSILORA 2.0 33-37-37-39-5E-30-8C-16	Name	SensiLoRa 2.0	Last Uplink RF Parameters
	Device Template		Last Seen
✓ Statistics	Battery	N/A	RSSI
🛍 Location	ADR Description	Enabled No description	Frequency SF
loRaWAN® Parameters	EUI	333737395E308C16 big endian (use by default)	Bandwidth
🐮 Channel Plan	JoinEUI	little endian (for LoRaWAN <sup>®</sup> non-compliant devices) 0101010101010101 big endian (use by default)	Gateway
亘 Downlinks		little endian (for LoRaWAN® non-compliant devices)	Last data (10 latest records)*
Mac Commands Log	Last Join	Never	*Data can be received from any gateway on the server of gateways received data
	C Transfer device	Send downlink	gutewuys received uutu

#### Figure 25. Back to Devices

6. In the <u>Devices</u> tab, you can view the addition of a device. When the added device connects to the server then we should see the value: **RSSI, SNR, devSNR, SF, and BAT,** for example, in Figure 26.

#### Figure 26. Status device

IN LORIO T	≣ ۵	Search										
<ul> <li>Back to Applications</li> </ul>												
BE-01-07-28	De	evices View device status chart										
+ Enroll Device												
🗮 Bulk Import												
- Devices		Device EUI 🔍 🌡	F Name	Q ↓↑	RSSI ↓†	SNR ↓↑	devSNR (dB) 🛛 🕸 🗍	SF ↓↑	BAT ↓↑	ADR <b>↓</b> ↑	Class ↓↑	Last Seen 🗍
📕 Devices Map		33-37-37-39-5E-30-8C-16	SensiLoRa 2.0		-89	6.8	6	12		ADR	A	2 minutes ago
🚯 Output												
💼 Output Data Format												
Websocket Applications							4					
✓ Statistics												

## 2.4 Output

1. In the SampleApp, go to the **<u>Output</u>** page (Figure 27).



Figure 27. Go to Output

IN LORIO T		Search										
<ul> <li>Back to Applications</li> </ul>												
BE-01-07-28	D	evices	tus chart									
+ Enroll Device			)									
☷ Bulk Import												
- Devices		Device EUI	⊂ †₽	Name	⊂ II	RSSI ↓↑	SNR ↓↑	devSNR (dB) 🛛 🕸	SF ↓↑	BAT ↓↑	ADR ↓↑	Class 🗍
Devices Map		33-37-37-39-5E-3	0-8C-16	SensiLoRa 2.0		-89	6.8	6	12		ADR	A
ሱ Output Data Format												
Websocket Applications												
✓ Statistics												

2. Data output link. Example: Use the <u>Target URL Template</u>, for Stm32CubeMonitor (Figure 28).

Figure 28. Target URL link

IN LORIO T	■ Q Search					
← Back to Applications	Application / Sam	ple application				
BE-01-07-28	Output	Name	Mechanism	Туре		🔊 WebSocket
+ Enroll Device	2	WebSocket	Listen and wait	LORIOT.io	1	Mechanism Listen and wait
⊞ Bulk Import	+ Add new output	ut				How to use WebSocket with LORIOT
🚺 Devices Map						Point your browser or library to the WebSocket URL and listen for incoming messages
Output						Output Configuration
🔥 Output Data Format						Output Name
Websocket Applications						Target URL Template           wss://eu2.loriot.io/app?token=vgEHKAAAAA1ldTlubG9yaW90LmlvK44WyL7818N9h4NUvG8o8w==
✓ Statistics						Your token can be found in access tokens submenu of your application
√ Join Server						
Access Tokens						

# **3 LORIOT Integration to Thingsboard**

## 3.1 Overview

1. After integrating LORIOT with the ThingsBoard, you can connect, communicate, process, and visualize data from devices in the ThingsBoard



IoT platform. For Integration LORIOT needs to use **Professional Edition**, his edition is paid, and it costs \$10/month, but upon registration, a trial (free) period of 30 days is given. For more information visit the website <u>LORIOT</u> <u>Integration</u>.

## 3.2 Registration

1. Go to <u>ThingsBoard.cloud</u> suit and register in the cloud (Figure 29).

	ard tform
G Login with Google	
() Login with Facebook	
🗭 Login with Github	
OR	
Username (email) * Invalid email format	
Password	<u>©</u>
	Forgot Password?
Login	
Do not have an account? Sign up	

## Figure 29. ThingsBoard Registration

## 3.3 Import a Data Converter

1. After registering and entering the clouds Download DataConverter: <u>SensiLoRa2 0 DataConverterV0.2.json</u>.

2. Add a Data Converter in ThingsBoard for this, go to the **Integrations center** (step 1), **Data converters** (step 2), click on <u>+</u> (step 3), and choose **Import converter** (step 4) (Figure 30).

Figure 30. Import a Data Converter

## **Getting started with**



SensiLoRa 2.0

ThingsBoard	🙆 Integrations center 👌 🗘 Data converters	Current subscription [ ThingsBoard Cloud Make Status ( Active )	r 🖸 📌 🕃 <sub>Tenant administrator</sub> 🕴
🔒 Home			
🖶 Plan and billing	Data converters		3 → + C Q
🛆 Alarms	Created time 🕹 Name	Туре	Create new converter
Dashboards			
E Solution templates NEW			1
🛦 Entities 🗸 🗸			
🖆 Profiles 🛛 🗸			4
2 Customers			
<b>e</b> Users			
Integrations center		No data converters found	
➡ Integrations	2		
다. Data converters			
<ul> <li>↔ Rule chains</li> </ul>			

2. In the window, Import Convert drag the downloaded Data Converter or click on the **Browse file** (step 1) and select the SensiLoRa2 0 DataConverterV0.2.json (Figure 31).

ThingsBoard	Integrations center >	រិ្ភ Data converters		Current subscription ThingsBoard Cloud Maker Status Active	а 🍂
A Home	Data converters				
Plan and billing					
▲ Alarms ■ Dashboards	Created time ↓	Name	Туре		
Solution templates					
🔒 Entities 🗸 🗸					
🖆 Profiles 🗸 🗸			Import converter ×		
2 Customers			Converter file*		
<b>e</b> Users					
🙆 Integrations center 🔷 🔨			Drag and drop a JSON file or <b>Browse file</b> X		
∃ Integrations			No file selected		
<ul><li>↔ Rule chains</li></ul>			Cancel Import		
👚 Edge management 🛛 🗸					
🛠 Advanced features 🛛 🗸					
🖿 Resources 🗸 🗸					
Notification center					
🗓 API usage					
<b>7</b> White labeling					

Figure 31. Choose a Data Converter

3. The selected Data converter will appear (step 1) and then click on **Import** (step 2) (Figure 32).

Figure 32. Click Import a Data Converter

## Getting started with



SensiLoRa 2.0

	Data converters	Current subscription ThingsBoard Cloud Maker Status Active	::	¢0
🔒 Home				
🖹 Plan and billing	Data converters			
<u>∧</u> Alarms	☐ Created time ↓ Name Type			
Dashboards				
III Solution templates				
🔥 Entities 🗸 🗸	Import converter X			
🏥 Profiles 🛛 🗸				
🕰 Customers	Converter file*			
<b>e</b> Users				
🔯 Integrations center 🔷	🕜 Drag and drop a JSON file or <b>Browse file</b> X			
➔ Integrations	SensiLoRa2_0_DataConverterV0.2.json			
้다. Data converters				
↔ Rule chains				
👚 Edge management 🛛 🗸				
🛠 Advanced features 🗸 🗸	2			
🖿 Resources 🛛 🗸				
Notification center				

4. After Importing, a Data Converter named <u>Loriot</u> will appear in the window Data converters (step 1) (Figure 33).

## Figure 33. Loriot Data Converter

ThingsBoard	🙆 Inte	egrations center >	រិ្ជ Data converters		ion ThingsBoard Cloud Maker tus Active	0	¢ <sup>0</sup>
✿ Home							
🖻 Plan and billing	Data	converters					
▲ Alarms		Created time $\downarrow$	Name	Туре			
Dashboards		2024-10-26 13:17:21	Loriot	Uplink			
Solution templates			20101	opinin			
📤 Entities 🗸 🗸			$\sim$				
🖆 Profiles 🗸 🗸							
😕 Customers				-			
<b>O</b> Users							



## 3.4. Create Integration

1. After importing Data Converter move on to the creation of Integration. Go to <u>Integrations</u> (step 1), click on  $\pm$  (step 2), and in **Integration type** (step 3), choose <u>Loriot</u> (step 4) (Figure 34).

#### Figure 34. Add Integration

	🙆 Integrations center 👌 🛨 Integra	ations	Current subscription ThingsBoard Cloud Maker Status Active	🖸 📌 😝 <sub>Tenant administrator</sub> I
🔒 Home		Add integration	⊘ ×	
🖶 Plan and billing	Integrations	1 2 3	- 4	+ C Q
🛆 Alarms	□ Created time ↓ Name	Basic settings Uplink data converter Downlink data converter	Daily activity	Status Remote
Dashboards		Optional	3	2
III Solution templates NEW		Integration type*		
🔥 Entities 🔷		Select integration type Outbuild unbaub messaging and straming AWS KINESIS		
[₀ញ Devices		platform.	i direania.	
🖿 Assets		AWS SQS         Azure IoT Hub           Fully managed message queuing service.         Cloud-hosted messaging service.		
🖬 Entity views		Custom	e. 4	
🏚 Profiles 🗸 🗸		Kafka		
22 Customers		streaming platform.		
<b>e</b> Users		© OceanConnect Integration of devices with different capabilities with the IoT platform. Pub/Sub Service for asynchronous messagin app.	ig between	
🖸 Integrations center 🛛 🔺			_	
ቲ그 Data converters				

2. In the field <u>Name</u> enter the name Loriot Integration (step 1) and click <u>Next</u> (step 2) (Figure 35).

## Figure 35. Basic settings Integration

🦓 ThingsBoa	ard	Integrations center >	FI Integrations				ThingsBoard Cloud Maker	::	<b>*</b> 1
🔒 Home		_	Add integration			? ×			
🖹 Plan and billing		Integrations	0	2	3	4			
\land Alarms		□ Created time ↓	Basic settings	Uplink data converter	Downlink data converter	-	Daily activity	Status	
Dashboards					Optional				
Solution templates	NEW		Integration type*			×			
♣ Entities	~		Lonot						
🏚 Profiles	~		Name* Loriot integratio						
2 Customers	_			וונ					
<b>e</b> Users			Enable integra	tion					
Integrations center	^		Debug mode	ovices or secote					
			Allow cleate u	evices of assets					
다 Data converters									
<ul><li>↔ Rule chains</li></ul>									
👚 Edge management	~								
🛠 Advanced features	~				2				
Resources	~					$\sim$ —	_		
Notification center						Next	ns per page: 10 👻	1 - 0	of 0

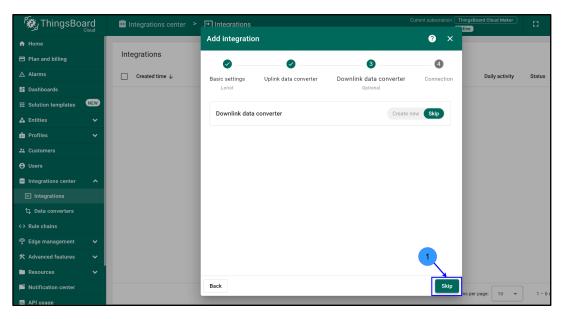


#### 3. Choose <u>Select existing</u> (step 1) and in the Uplink Data Converter field choose <u>Loriot</u> (step 2) and click <u>Next</u> (step 3) (Figure 36). Figure 36. Choose Loriot

	Integrations center >	₽ Integrations	Current subscription	ThingsBoard Cloud Maker	3
🔒 Home		Add integration	? ×		
🖻 Plan and billing	Integrations	0 0 0	4		
\land Alarms	Created time 🕁	Basic settings Uplink data converter Downlink data conv	Connection	Daily activity	Status
Dashboards		Loriot Optional			
III Solution templates NEW					
🛦 Entities 🗸 🗸			ect existing		
🤷 Profiles 🛛 🗸 🗸		Uplink data converter*			
💒 Customers		Loriot			
<b>e</b> Users		Lonot			
Integrations center					
∃ Integrations					
다 Data converters					
<ul><li>↔ Rule chains</li></ul>					
👚 Edge management 🛛 🗸 🗸					
🛠 Advanced features 🛛 🗸			3		
Resources 🗸					
Notification center		Back	Next	ns per page: 10 👻	1 - 0
					J

4. Click on Skip (step 1) (Figure 37).

## Figure 37. Skip Downlink data converter





5. Click to <u>Copy HTTP endpoint URL</u> (step 1) and click on <u>Add</u> (step 2) (Figure 38).

## Figure 38. Copy HTTP

🦓 ThingsBoa		Integrations center >	Integrations     Current subscription	ThingsBoard Cloud Maker	::	<b>*</b>
A Home			Add integration ?	×		
🖻 Plan and billing		Integrations	0 0 0 4			
\land Alarms		Created time 🕹	Basic settings Uplink data converter Downlink data converter Connectic	n Daily activity	Status	
Dashboards			Loriot Optional			
Solution templates	NEW		Base URL*			
♣ Entities	~		https://thingsboard.cloud			
🏥 Profiles	~		HTTP endpoint URL	1		
22 Customers			https://thingsboard.cloud/api/v1/integrations/loriot/36179bed-8403-534b			
<b>e</b> Users			Copy HTTP end	oint URL		
Integrations center	^		Send downlink			
➔ Integrations			Enable security (Headers filter)			
고 Data converters						
<ul><li>↔ Rule chains</li></ul>			Execute remotely	J. J		
$\widehat{\mathcal{T}}$ Edge management	~		Advanced settings	·		
🛠 Advanced features	~		2			
Resources	~ ]					
Notification center			Back	d ns per page: 10 👻	1-(	0 of 0
II. API usage				no per page.	1 - 0	

6. Go to **Applications** in LORIOT (Figure 39).

Figure 39. Go to Applications





## 7. Select **Sample App** Application (Figure 40).

## Figure 40. Select SampleApp

IORIO T	<b>Q</b> Search			
<ul> <li>Back to Dashboard</li> </ul>		Π		
	LoRaWAN <sup>®</sup> Applicat	ions		
+ New Application	Application ID Q	↓ <b>?</b> Name	Q 11 Devices	Q 1 Max. Devices Q 1
Device Templates	BE010309	SampleApp	2	10

8. In Application go to <u>**Output**</u> (step 1) and click on <u>**Add new**</u> <u>**output**</u> (step 2) (Figure 41).

#### Figure 41. Add Output

ini lorio t	■ Q Search					<b>A</b> 😑 🛈 🔄
<ul> <li>Back to Applications</li> </ul>	Application / Sa	ampleApp				
BE-01-03-09	Output	Name	Mechanism	Туре		🔊 WebSocket
+ Enroll Device	रिय	WebSocket	Listen and wait	LORIOT.io	/	Mechanism Listen and wait
⊞ Bulk Import	+ Add new o	output 2				How to use WebSocket with LORIOT
🔰 Devices Map						Point your browser or library to the WebSocket URL and listen for incoming messages
🕰 Output 1						Output Configuration
🏟 API Data Format						Output Name
Websocket Applications						Target URL Template wss://eu2.loriot.io/app?token=vgEDCQAAAA1ldTlubG9yaW90LmlvsMd0v-NLa4RSNeRhHKi4GQ==
✓ Statistics						Your token can be found in access tokens submenu of your application
and the server and th						
Access Tokens						
	Copyright © 2015 - 2023	LORIOT AG. All rights re	eserved.			In LORIOT   Internet of Things at Long Range   Impressum



9. Select <u>HTTP PUSH</u> output type (step 1). In <u>Target URL for</u> <u>POSTs</u> paste the HTTP URL with ThingsBoard (step 2) and click <u>Add</u> <u>Output</u> (step 3) (Figure 42).

i LORIO T	■ Q Search					Add integration		? ×	ve	🛑 🛈 🔶
<ul> <li>Back to Applications</li> </ul>	Application Output / E	3E010728			Ľ		Ø	•		
BE-01-07-28	Choose output type	1				Basic settings Uplink data converter	Downlink data converter Optional	Connection		
+ Enroll Device	,	IoT data? See the Application Ou	tput catalog for details			Base URL* https://thingsboard.cloud				
⊞ Bulk Import	CoAP Push	HTTP://		HTTP.//		HTTP endpoint URL		_		
🖷 Devices	LORIOT.Io	HTTP Push	MQTT LORIOT.ie			https://thingsboard.cloud/api/v1/inte	grations/loriot/1807c66d-2b2a-	caOb 🖸		
🚺 Devices Map				Catura		Create Loriot Application output				
Output	TLS	<u>स्र</u> ि	AllThingsTalk	Setup guid Set up a HTTP ser		and listen for incoming POST requests from our s				
률 Output Data Format	TLS Socket	WebSocket	AllThingsTalk				COPY			
Websocket Applications		-		Setup para	am	eters				
🛃 Statistics	4	٠	$\sim$	Output Name (O	Optio	nal)	Output Name			
💙 Join Server	Amazon AWS IoT	Azure IoT Central	Azure IoT Hub 3rd party	Target URL for PO	OST	₃ <b>2</b> →	https://thingsboard.cloud	/api/v1/integrations/l	oriot/361	79bed-8403-!
Access Tokens		Stepany		"Authorization"	' hea	der value (Optional)	"Authorization" header va	lue		
₩ Log	<b>\$</b>	Ø	Digimondo	Custom header n		e (Optional)	Custom header name			
≛ Downloads	Cumulocity	Datacake	3rd party	Custom heads	3	(Optional)	Custom header value			
	3rd party	3rd party	Stopury			1				
				Add Output		]				
	InfluxDB v1	Iron.io IronMQ v1	Iron.io IronMQ v3							

## Figure 42. Create HTTP Push

## 3.5 Device

1. To view, the active devices go to the <u>Entities</u> page(step 1), choose <u>Devices</u>(step 2), and there will be devices that are connected to the Loriot server and transmitting data to it (Figure 43).



## Figure 43. Active Devices

	🐻 All 🐻 Groups
🗄 Dashboards 📃	
III Solution temp!ates	Devices $\overline{}$ Device Filter Include customer entities
🚓 Entities 🔥	
🗔 Devices	Created time ↓ Name ↑ Device profile Label State Customer name Groups
Assets	2024-10-27 06:36:53 333737395E308C16 SensiLora2.0 Active
Entity views 2	1
🖆 Profiles 🗸 🗸	u <sup>1</sup> . LORIOT ≡ Q Search
2 Customers	
<b>e</b> Users	Back to Applications
Integrations center	Le SAMPLE APPLICATION Devices
	View device status chart
다. Data converters	+ Enroll Device
<> Rule chains	#≣ BulkImport
👚 Edge management 🛛 🗸	Devices Device EUI
🛠 Advanced features 🛛 🗸	M Devices Map 33:37:37:39:5E:30:8C:16 SensiLoRa 2.0

2. To view the data from the sensors, click on Device <u>SensiLora2.0</u> (step 1), and choose the <u>Latest telemetry</u> (step 2). Here are the sensor values (step 3), click on the  $\geq$  (step 4), to view other values. To close the Device details, click on the <u>X</u> (step 5) (Figure 44).

#### Figure 44. Latest telemetry

Alarms		la All	Groups										5
📑 Dashboards			Lag of dapo										<u> </u>
III Solution templates	E D	evices = Device	Filter 🥢 Include cu	stomer entities		737395E3080	C16 2					?	
🚓 Entities	^		1		Devic	e details							
ӣ Devices		] Created time ↓	Name	Device prof	Detail	s Attributes	Latest telemetry	Alarms	Events	Relations	Audit logs	Version c	0
🛅 Assets		2024-10-27 06:36:53	333737395E308C16	SensiLora 2.					3				
🖬 Entity views					Te	lemetry						+	Q
🏦 Profiles	~					Last update time	Key ↑		Valı	ue			
2 Customers	_												-
😫 Users	_					2024-10-27 06:48:13	AccelerationX		-5.4	524974			Î
Integrations center	^					2024-10-27 06:48:13	AccelerationY		-4.5	7970555			Ξ.
➡ Integrations						2024-10-27 06:48:13	AccelerationZ		6.87	74461649999999			î
1그 Data converters						2024-10-27 06:48:13	BatteryVolt		4.2				-
<→ Rule chains	_					2024 10 27 00.40.10	Dutteryvolt		7.4				-
👚 Edge management	~					2024-10-27 06:48:13	freq		868	500000			Î
🛠 Advanced features	<b>~</b>					2024-10-27 06:48:13	GyroX		-0.0	366513			Î
Resources	×												
Notification center								Items pe	er page: 10	- 4	<del>18 of 15 🔶</del> 🔣	< >	>1



## 3.6 Dashboard

3.6.1 Overview

1. You can import a Dashboard and skip the next steps, for this go to section <u>3.6.5 Import Dashboard</u>.

## 3.6.2 Add Dashboard

1. Add Dashboard, go to <u>Dashboards</u> (step 1), click <u>+</u> (step 2), and choose <u>Create new dashboard</u> (step 3) (Figure 45).

## Figure 45. Create new Dashboard

ThingsBoard	📰 Dashboards 🔸 👫 All		Current subscription ThingsBoard Cloud M Status Active	Aaker C3 📌 😌 Ienant administrator 🗄
✿ Home	All Groups			2
Plan and bil 1				3
Alarms	Dashboards 🥑 Include customer entities			+ C Q
👫 Dashboards	□ Created time ↓ Title	Customer name	Groups	Create new dashboard
III Solution templates NEW				▲ Import dashboard
🔒 Entities 🛛 🗸 🗸				,

2. Enter the name **SensiLora 2.0** in the <u>Title</u> field (step 1) and click <u>Add</u> (step 2) (Figure 46).

## Figure 46. Add SesnsiLoRa 2.0 Dashboard

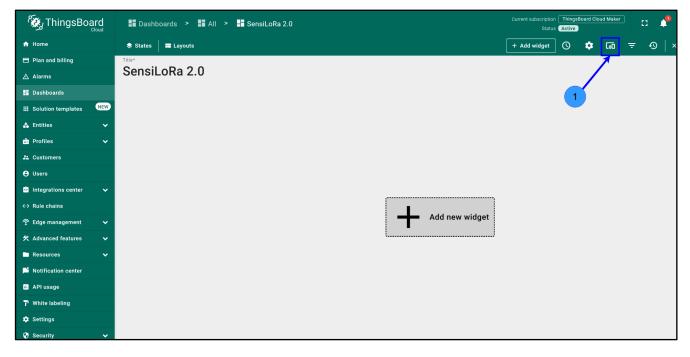
ThingsBoard	📲 Dashboards > 📲 A	All				Status Active
🔒 Home		Add dashboar	d		? ×	
🖶 Plan and billing						
\land Alarms	Dashboards 🥪	Include custo SensiLoRa 2.0	1			
🔚 Dashboards	Created time ↓	Title				
III Solution templates		Description				
🔥 Entities	×				le	
🔓 Profiles	• •	Mobile applica	tion settings			
2 Customers		Hide da	shboard in mobile application			
<b>e</b> Users		Dashboard	order in mobile application			
D Integrations center	×					
↔> Rule chains		Dashboard image				
👚 Edge management	·	No image		e		
🛠 Advanced features	·	selected	Browse from gallery	Set link		
Resources	·					
Notification center				-		
🗓 API usage		Owner and gro	ups	2		
🄁 White labeling		Owner*			×	
🏟 Settings						
Security	· .			Cancel	Add	
						Items per page: 10 👻



3.6.3 Add Entity Aliases

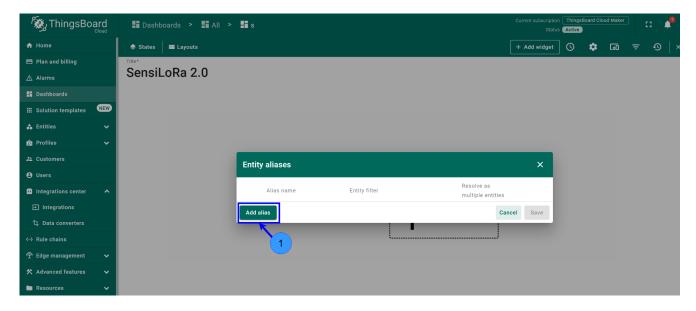
## 2. Click on *Entity aliases* (step 1) (Figure 47).

## Figure 47. Entity aliases



3. Click on Add alias (step 1) (Figure 48).

#### Figure 48. Go to Add alias





4. Enter the Alias name: <u>Sensors</u> (step 1), choose in Filter type: <u>Device type</u> (step 2), choose <u>SensiLora2.0</u> Device profile(step 3), and click <u>Add</u> (step 4) (Figure 49).

Add alias	×
Alias name* Sensors	Resolve as multiple entities
Filter type* Device type	3
SensiLora2.0 × +Device profile	
Device name expression	0
	4
	Cancel Add

#### Figure 49. Filling Add alias



#### Figure 50. Save alias

Entity	y aliases		×
	Alias name	Entity filter	Resolve as multiple entities
1.	Sensors	Devices of type "SensiLora2.0"	
Add a	lias		Cancel Save



3.6.4 Add Temperature widget

1. Add a new widget. For this click <u>Add new widget</u> (step 1) (Figure 51).



ThingsBoard	🖬 Dashboards 🔸 🖬 All 🔸 📑 SensiLoRa 2.0		n ThingsBoard Cl s Active	oud Maker	:	а.	•
🔒 Home	🕏 States 🛛 🖬 Layouts	+ Add widget	0	600	Ŧ	Ð	>
Plan and billing	Title*						
\land Alarms	SensiLoRa 2.0						
Dashboards							
III Solution templates NEW							
🔒 Entities 🗸 🗸							
🖆 Profiles 🗸 🗸							
22 Customers	<b></b>						
<b>e</b> Users							
Integrations center							
<ul><li>↔ Rule chains</li></ul>							
🙊 Edge management 🛛 🗸	Add new widge	et					
🛠 Advanced features 🗸 🗸		)					
🗖 Resources 🗸 🗸							
Notification center							
🗓 API usage							
🏲 White labeling							
🔹 Settings							

2. Choose the **<u>Cards</u>** widget bundle (step 1) (Figure 52).

Figure 52. Choose the Cards widget

المجمع ThingsBoard	🚦 Dashboards 🔸 📑 All 🔸 🕂 SensiLoRa 2.0	Current subscription ThingsBoard Cloud Maker Status (Active)						
A Home	SensiLoRa 2.0	Select widgets bund	lle	Q 🛓 Import widget 🛛 Widgets				
🖹 Plan and billing	SelisiLora 2.0							
🛆 Alarms		Charts sys i	Cards sys i	Alarm widgets sys i				
Dashboards			Temperature 22°C: 21 - 21 - 25	Total 3				
III Solution templates NEW			22°C 21. * m	Alarms				
🛦 Entities 🗸 🗸			Function Random -19.21	□         Type ↑         Severity         Status           □         Temperature         Major         Dieared				
💼 Profiles 🗸 🗸			5m 4.17 Cos 15.43	Temperature Critical Cleared     Low Humidity Warning Active				
🕰 Customers		Count widgets sys	Maps sys	Analogue gauges sys				
<b>e</b> Users		Count widgets sys 1	Maps sys 🚺	Analogue gauges sys 🕕				
🙆 Integrations center 🛛 🗸	1	Total 3						
↔ Rule chains		<b>4</b> 3	Google "0" 44 H 0 - H H					
👚 Edge management 🛛 🗸		Device 296						
🛠 Advanced features 🛛 🗸								
Resources		Control widgets sys i	Status indicators sys 🚺	SCADA symbols sys i				
Notification center		Round switch	Law Law					

3. Choose the **Value card** widget (step 1) (Figure 53).





Figure 53. Choose the Value card

ThingsBoard	👫 Dashboards 🗧 📲 All 🔸 🕂 SensiLoRa 2.0	Current subscription [ThingsBoard Cloud Maker] Status [Active]				
✿ Home	SensiLoRa 2.0	← Cards: select widget	Q = A			
Plan and billing	SelisiLora 2.0					
\land Alarms		Value card latest 1 Horizontal value card latest 1	Value and chart card series 1			
			Cold water usage			
III Solution templates NEW		Temperature	21,			
🔒 Entities 🗸 🗸			21, *			
🖞 Profiles 🗸 🗸		Last update 1d ago	5			
22 Customers						
e Users		Label card static i Label & value card latest i	Progress bar latest			
Integrations center		ſ	Progress bar			
↔> Rule chains		🛔 Thermostat A1 🔒 Temperature 22°C				
👚 Edge management 🛛 🗸			36%			
🛠 Advanced features 🗸 🗸			0 100			
🖿 Resources 🗸 🗸		Dashboard state widget static  QR Code latest	Mobile app QR code static			
Notification center						
😃 API usage		Name $\psi$ Charget, 's Time $\psi$ Humidity, 's				
<b>7</b> White labeling		Adam 0.6 04215 12 Linet 52 272 04216 41				
24: Customers       Customers<		Deshboard state widget static Decision Wenty Testy Wenty Testy Testy Wenty Testy Wenty Testy	Progress bar Progress bar 36 % 0 100			

4. In the **Device field** choose the **<u>Device</u>** (step 1) (Figure 54).

Figure 54. Add Datasource

ThingsBoard	Dashboards > 📑 A	All ゝ 📑 SensiLoRa 2.0			urrent subscription Thing Status Active		: 4	÷
🔒 Home	🕏 States 🛛 🖬 Layouts				- Add widget	\$ 60		
🖹 Plan and billing	Title*	Add widget: Value card		Basic Advanced	? ×			
🛆 Alarms	SensiLoRa 2.0							
Dashboards		Datasource		Device	Entity alias			
III Solution templates		Device*						
📥 Entities		<u> </u>						
nter and the second sec		333737395E308C16						
22 Customers		≁ temperature 🖌 ×						
😫 Users								
Integrations center		Appearance						
↔ Rule chains								
🙊 Edge management		Layout	Square		×			
🛠 Advanced features		Auto scale						
Resources								
Notification center		Label	Temperature					
🖪 API usage								
<b>P</b> White labeling		- loon	40 A PV	_				
🖨 Settings		Cancel		Pr	eview Add			
Security								

5. Click on the <u>edit</u> temperature Data key (Step 1) (Figure 55).

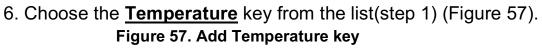


## Figure 55. Edit Data key

🦓 ThingsBo	ard	Dashboards >	All ゝ 📑 SensiLoRa 2.0					on Things		: 🍂
🔒 Home		🕏 States 🛛 📰 Layouts					+ Add widget	0	\$ 600	∙ <b>⊙</b>
🖻 Plan and billing		Title*	Add widget: Value card		(	Basic Advance	e) ?	×		
🛆 Alarms		SensiLoRa 2.0								
Dashboards			Datasource			Device	) Entity alias			
Solution templates	NEW		Device*				×			
💧 Entities			333737395E308C16				~			
💼 Profiles			Data key*							
💒 Customers			↔ temperature							
<b>e</b> Users								- 8		
Integrations center			Appearance					- 1		
↔ Rule chains										
Edge management			Layout	Square			~			
🛠 Advanced features			Auto scale							
Resources										
Notification center				Temperature			<u>A</u>			
👖 API usage										
🍞 White labeling			- loon	40	A nv					
🖨 Settings			Cancel			P	review A	dd		
Security										

## 6. Delete the <u>temperature</u> key (step 1) (Figure 56). Figure 56. Delete Data key

🆓 ThingsBo	ard	📕 Dashboards ゝ 📕	ll ≥ 📕 SensiLoRa 2.0		ent subscription T Status Ac			c: 🍂	
🚖 Home		🕏 States 🛛 📰 Layouts		+	Add widget	<b>\$</b>	[00]		
🖹 Plan and billing		Title*	Data key configuration		×				ĺ
🛆 Alarms		SensiLoRa 2.0			_				
Dashboards			General						
Solution templates	NEW		<sub>Key*</sub> temperature		×				
🛔 Entities			temperature	1					
🛍 Profiles			Aggregation	None	•				
🚨 Customers			Take latest value.						
<b>e</b> Users			Take Micor Mine.						
Integrations center									
↔ Rule chains			Use data post-processing function						
👚 Edge management									
🛠 Advanced features									
Resources									
Notification center									
🖬 API usage									
<b>7</b> White labeling									
🕸 Settings				C;	incel Save				
😯 Security									



## **Getting started with**



SensiLoRa 2.0

🎉 ThingsBo	ard	Dashb	oards > 📕 A		> 📲 SensiLoRa 2.0		tion Things atus Active		:	•
A Home			🖬 Layouts			+ Add widge	t (	\$ 600		
🖶 Plan and billing		Title*	<b>D</b> 0.0	Da	Data key configuration		×			
\land Alarms		Sensil	.oRa 2.0	1						
📲 Dashboards				11	General		- 8			
Solution templates	NEW			11	Key*					
📩 Entities				1.	Key name		- 10			
🛍 Profiles					MagX					
2 Customers					MagY					
😫 Users					MagZ					
Integrations center					Pressure		28			
<↔ Rule chains					Temperature		118			
👚 Edge management							11			
🛠 Advanced features										
Resources							- 8			
📕 Notification center							- 8			
🖬 API usage							- 8			
聍 White labeling										
🗱 Settings						Cancel	Save			
Security										
										D/

## 6. Click on <u>Save</u> (step 1) (Figure 58).

Figure 58. Save Data key

ard	📕 Dashboards ゝ 📕 A	ll > 📕 SensiLoRa 2.0						a 🍂
	🕏 States 🛛 📰 Layouts			+ Add widget	\$	[]		
	Title*	Data key configuration		×				
	SensiLoRa 2.0			_				
		General						
NEW		Key*		×				
		remperature						
		Aggregation	None	-				
		Take latest value						
		Use data post-processing function						
				Cancel Save				
		<ul> <li>States E Layouts</li> <li>SensiLoRa 2.0</li> <li>A</li> &lt;</ul>	State     SensiLoRa 2.0     Cereal     Key*        Aggregation        Take latest value.     Out a data post-processing function	State     SensiLoRa 2.0     Cereal     Magregation     Take latest value.     Out a data post-processing function	<pre>child is pathboards &gt; if Al &gt; if SensiLoRa 2.0</pre>	State Layout     SensiLoRa 2.0     Ceneral     Ke*     Ceneral     Ke*     Aggregation     Table latest value.     Out of the state o	<pre>\$ State Legent</pre>	Image: SensiLoRa 2.0     Image:

7. Click on the <u>Add</u> widget (step 1) (Figure 59). Figure 59. Save widget

## **Getting started with**



SensiLoRa 2.0

	📕 Dashboards > 📕 A		ThingsBoard Clou Active	0	<b>*</b> <sup>0</sup>		
🔒 Home	🕏 States 🛛 🖬 Layouts			+ Add widget	© 🌣	 ÷ 🤆	ড ∣ >
🖻 Plan and billing	Title*	Add widget: Value card		Basic Advanced ? >	<		
🛆 Alarms	SensiLoRa 2.0				-		
Dashboards		Datasource		Device Entity alias			
III Solution templates		Device*		×			
🛦 Entities 🔹		333737395E308C16		^			
💼 Profiles 🔹 🤊		Data key*					
🚨 Customers		✓ Temperature ✓ ×					
<b>e</b> Users							
🔯 Integrations center 🔹 🔨		Appearance					
↔ Rule chains				]			
👚 Edge management 🔹 🤊		Layout	uare	~			
🛠 Advanced features 🔹 🤊		Auto scale					
Resources							
Notification center		Cabel Ter	mperature				
16 API usage							
<b>7</b> White labeling		loon 40	A				
🌣 Settings		Cancel		Preview			
Security							

7. The added widget can be seen on the Dashboard. For save changes click on <u>Save</u> (step 1) (Figure 60).

## Figure 60. Save Dashboard

ThingsBoard	📰 Dashboards 🔹 📑 All 🕞 📑 SensiLoRa 2.0	Current subscription ThingsBoard Cloud Maker Status Active
🔒 Home	🕏 States 🛛 🚍 Layouts	+ Add widget 🕐 🏟 🐻 = 🕂 🗙 Cancel 🗸 Save 🕻
Plan and billing	Title*	
\land Alarms	SensiLoRa 2.0	1
Dashboards		
III Solution templates NEW	East update 1d ago	
🛦 Entities 🗸 🗸	23 °C	
🖆 Profiles 🗸 🗸	25 0	
🚨 Customers		
<b>e</b> Users		
🗿 Integrations center 🛛 🗸		
<ul> <li>↔ Rule chains</li> </ul>		
👚 Edge management 🛛 🗸		
🛠 Advanced features 🛛 🗸		
🖿 Resources 🛛 🗸 🗸		
Notification center		
d. API usage		
<b>7</b> White labeling		
💠 Settings		
Security		

## 3.6.5 Import Dashboard

1. Download the Dashboard: SensiLoRa2 0 DashboardV0.1.json

2. Go to <u>**Dashboards**</u>(step 1), click on <u>+</u> (step 2), and choose the <u>**Import dashboard**</u> (step 3) (Figure 61).



SensiLoRa 2.0

Figure 61. Choose Import Dashboard

ThingsBoard	🛢 Dashboards 🔸 📑 All	Ourrent subscription [ ThingsBoard Cloud M Status [ Active]	Maker 🕄 📌 🕃 Tenant administrator 🕴
🔒 Home	S All Groups		
Plan and billing			_
🛆 Alarms	Dashboards		+
Dashboards	□ Created time ↓ Title Customer	r name Groups	Create new dashboard
III Solution. templates NEW	-		▲ Import dashboard
♣ Entities			
Ga Devices			
Assets			3
🔚 Entity views			
🖆 Profiles 🛛 🗸			
22 Customers			
😝 Users		No dashboards found	
🙆 Integrations center 🛛 🔺			
Integrations			
ᅻ, Data converters			
↔> Rule chains			
👚 Edge management 🛛 🗸			
& Advanced features			

3. Drag and drop the downloaded Dashboard (<u>SensiLoRa2 0 DashboardV0.1.json</u>) (step 1). Import Dashboard should be displayed (step 2), after clicking <u>Import</u> (step 3) (Figure 62). Figure 62. Import Dashboard

۲ کی ThingsBoa	ard	Dashboards >	All			Current subscription ThingsBoard Cloud Maker Status Active	0	<b>Å</b> <sup>0</sup>
🔒 Home			Groups					
🖹 Plan and billing			-					
\land Alarms		Dashboards	Include customer entities					
Dashboards		□ Created time ↓	Title	Customer name		Groups		
Solution templates	NEW							
🛔 Entities				Import dashboard	×			
🖆 Profiles								
🏞 Customers				Dashboard file*				
<b>e</b> Users								
Integrations center				Drag and drop a JSON file or <b>Browse file</b>	×			
↔ Rule chains				sensiLoRa2_0_DashboardV0.1.json				
👚 Edge management					- 1			
🛠 Advanced features				Cancel	mport			
Resources					1			
Notification center				3	5			
11. API usage								
🕈 White labeling								

4. Go to <u>SensiLoRa 2.0</u> Dashboard (Figure 63). Figure 63. Go to Dashboard

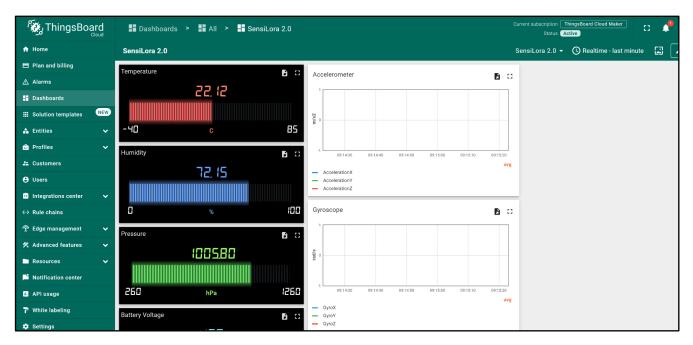
## **Getting started with**



	📕 Dashboards 🔸 💶 All		Current subscription ThingsBoard Cloud Maker Status Active
✿ Home	All Groups		
🖶 Plan and billing			
<u>∧</u> Alarms	Dashboards		
Dashboards	Created time ↓ Title	Customer name	Groups
E Solution templates			
🔒 Entities 🗸 🗸	2024-10-28 09:13:37 SensiLora 2.0		
🖆 Profiles 🗸 🗸			
📇 Customers			
🖨 Users	Click		

- 5. In SensiLoRa 2.0 Dashboard the following widgets are located:
- **Temperature**, units: °C
- **Humidity**, units: %
- Pressure, units: hPa
- Battery voltage, units: V
- Light, units: lux
- Accelerometer, units: m/s2
- Gyroscope, units: rad/sec
- Magnetometer, units: µT

## Figure 64. SensiLoRa 2.0 Dashboard





# 4 STM32CubeMonitor

# 4.1 Install STM32CubeMonitor

1. Download and install a program from the ST site at this link <u>STM32CubeMonitor</u> and download an example project by this link <u>SensiLoRaCubeMonitorV0.3.json</u> (Figure 65).

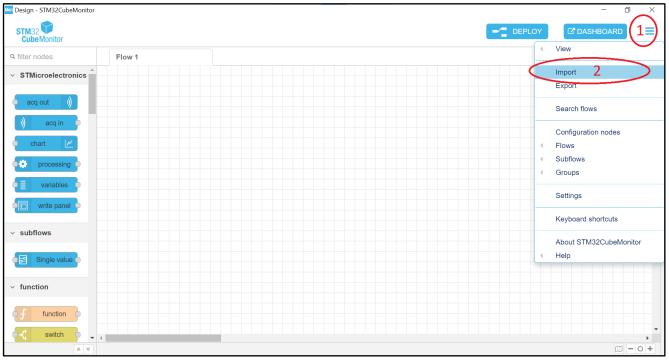


Figure 65. Main window STM32CubeMonitor



# 4.2 Import project

1. Opening the program and clicking on the <u>selection tab</u> (step 1), a selection menu will open, and then select <u>Import</u> (step 2) (Figure 66).



#### Figure 66. Selection Import menu

2. A window will open with the choice of a file to import. In the import window, select <u>Clipboard (step 3)</u>, then click on <u>Select a file to import</u>



SensiLoRa 2.0

(step 4) and select the file <u>SensiLoRaCubeMonitorV0.3.json</u> which we downloaded. After selecting the file click on <u>Import (step 5)</u> (Figure 67).

Mean Design - STM32CubeMonitor			-	D	×
STM32 CubeMonitor	Import nodes	EPLOY			≡
Q filter nodes Flow 1				+	≣
<ul> <li>STMicroelectronics</li> </ul>	Clipboard 3 Paste flow json o select a file to import				<b>^</b>
acq out	Library				
)) acq in	{     "id": "780b10ab.0c7e6",     "type": "tab",				
chart 🗾	"label": "SensiLoRa", "disabled": false,				
processing	"info": "" }, {				
variables	1 "id": "151b9658.0519aa", "type": "websocket in",				
write panel	"z": "780b10ab.0c7e6", "name": "Loriot Uplink",				
v subflows	"server": "", "Client": "54daa66.5f90158", "x": 190, "y": 320,				
Single value	"wires": [ [ "				
~ function	Import to current flow new flow				
f function	Cancel Import 5				
o-¢ switch o ↓					* }
* *			ũ	- 0	+

#### Figure 67. Import project

## 4.3 Configuration Loriot Uplink

1. Go to the tab SensiLoRa 2.0 (Figure 68).

#### Figure 68. Go to the SensiLoRa project



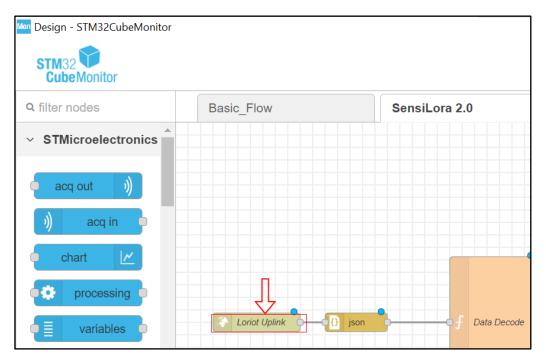
# Getting started with

SensiLoRa 2.0

Mon Design - STM32CubeMonitor				- 🗆	$\times$
STM32 Cube Monitor			DEPLOY	C <sup>a</sup> DASHBOARD	=
Q filter nodes	Basic_Flow	SensiLora 2.0		+	:=
✓ STMicroelectronics					<b>*</b>
acq out ))	START Acquisition	myVariables	myProbe_Out		
chart 🗹	STOP Acquisition				
variables					

2. Configure the WebSocket **Loriot Uplink**, and double-click on it to open settings (Figure 69).

#### Figure 69. Open Loriot Uplink



3. When opening the settings window, here we click on the <u>URL</u> <u>editing icon</u> (Figure 70).

#### Figure 70. Setting the Loriot Uplink



SensiLoRa 2.0



			– 0 ×
		-/ DEPLOY	
	Edit websocket i	n node	
	Delete		Cancel Done
	Properties		* E Di
Pressure	🖸 Туре	Connect to	→ Ţ
Humidity	URL	54daa66.5f90158	~ Ø
a Decode Accelerat	Name Name	Loriot Uplink	
Accelerat			

4. In this window, we must insert the URL. If the Loriot server is used, then the link must be taken from 2.4 Loriot Uplink. After inserting the URL, click on **Update** (Figure 71).

Figure 71. URL

Amsterdam Community Account	
	Edit websocket in node > Edit websocket-client node
💸 WebSocket	Delete Cancel Update
Mechanism Listen and wait	Properties
How to use WebSocket with LORIOT Point your browser or library to the WebSocket URL and listen for incoming messages	■ URL Send/Receive payload ~
Output Configuration Target URL Template Wss://eu2.loriot.io/app?token=vgEDCQAAAA1IdTlubG9yaW90LmlvsMd0v-NLa4RSNeRhHKi4GQ== Your token can be found in access tokens submenu of your application	URL should use ws:// or wss:// scheme and point to an existing websocket listener. By default, payload will contain the data to be sent over, or received
	from a websocket. The client can be configured to send or receive the entire message object as a JSON formatted string.

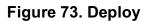
5. Click on **Done** to save the URL (Figure 72).

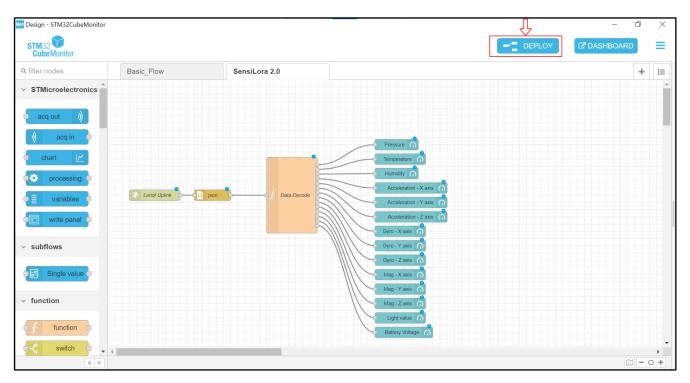
## Figure 72. Save the URL



	- 0 ×
Edit websocket i	n node
Delete	Cancel
Properties	
💿 Туре	Connect to ~
URL	wss://eu2.loriot.io/app?token=vgEDCQ/ V
Name	Loriot Uplink

6. Click on **Deploy** so that our changes are saved and take effect (Figure 73).



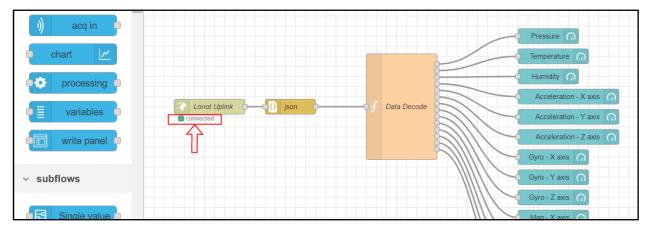


## 4.4 Dashboard

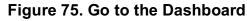
1. When we have changed the Server URL to the necessary their status should be **connected** (Figure 74).

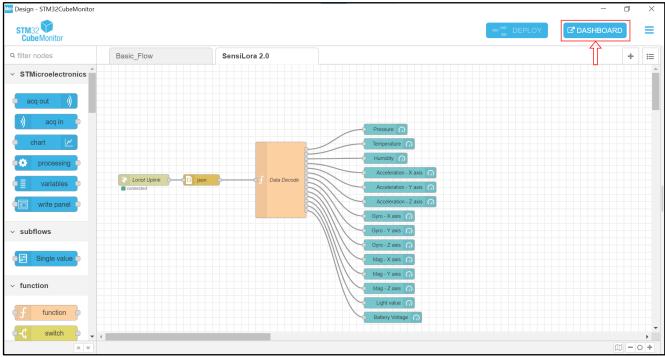


Figure 74. Status Loriot



2. Click the **DASHBOARD** (Figure 75).





3. If several projects are open, then we need to go to the tab of our project, for this, we click on the selection project (step 1) and then click on **SensiloRa** (step 2) (Figure 76).



### Getting started with

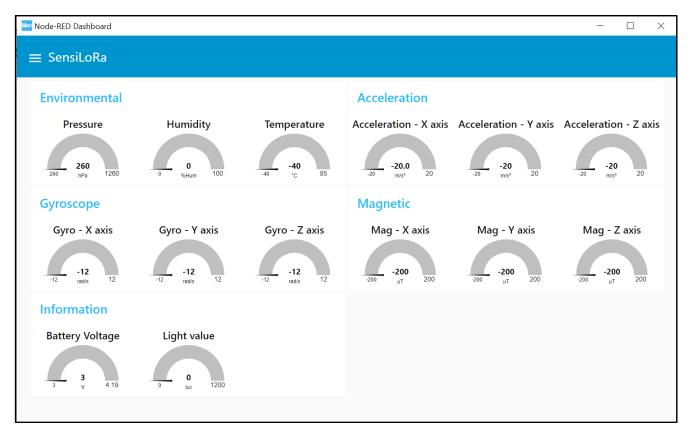
SensiLoRa 2.0

#### Figure 76. Selection of a project

Mon Node-RED Dashboard				—	$\times$
\cdots SensiLoRa	2				•
Home		STOP ACQUISITION	CLEAR GRAPHS		
			Show Points Zoom Show All		

4. After selecting the project, we should see a window (Figure 77).





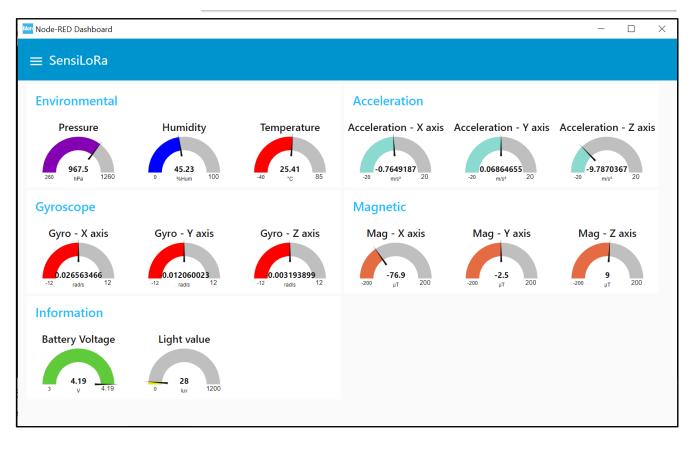
5. When the data is sent by SensiLoRa 2.0 to the server Loriot, we will see the value of the sensors (Figure 78).

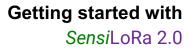
#### Figure 78. Data with sensors



Getting started with

SensiLoRa 2.0







# 5 Flashing SensiLoRa 2.0

## 5.1 Install STM32CubeProgrammer

1. Download and install STM32CubeProgrammer from the ST site at this link: <u>STM32CubeMonitor</u> (Figure 79). There are several versions of the firmware, which differ in the operating frequencies of the LoRa, so pay attention to the name of the firmware, the operating frequency is indicated there. Download the firmware: (<u>Firmware SensiLoRa 2.0</u>).

Pro STM3	2CubeProgrammer		- 0 ×
STM32 Cube	V Programmer	🧐 🚺	🕨 У 🔆 🏹
	Memory & File edition		Not connected
	Device memory Open file +	USB	▼ Connect
	Address Size Data width 32-bit V Find Data 0x Read V	Port	USB configuration
OB		Serial number	No DFU detected 🔹 🖸
		PID	0xdf11
СРИ	No data to display	VID	0x0483
swv		Read Unprotect (M	cu)
	Log Verbosity level 💿 1 💿 2 💿 3		
	11:45:52 : STM32CubeProgrammer API v2.7.0 11:45:52 : ST-LINK error (DEV_CONNECT_ERR)		
		Board Device	Target information -
(1) (2)		Type Device ID	-
?	0% 🛞	Revision ID Flash size CPU	-

Figure 79. STM32CubeProgrammer



# 5.2 Flashing with SensiEdge Basic Debugger

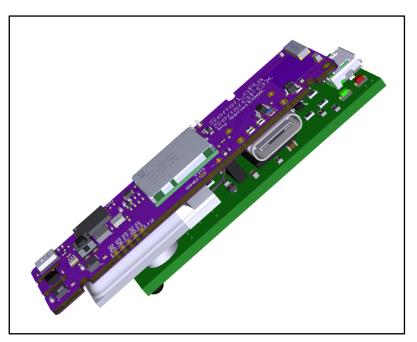
1. For the programming SensiLoRa 2.0 use the programmer SensiEdge Basic Debugger (Figure 80), if you don't have one, then go to <u>4.3 Flashing via USB Type-c</u>.

#### Figure 80. SensiEdge Basic Debugger



2. Connect the SensiLoRa 2.0 to the programmer's SensiEdge Basic Debugger (Figure 81) and then connect the USB to the programmer.

#### Figure 81. Connect to programmer





3. Open the program STM32CubeProgrammer and select the <u>ST\_LINK</u> (step 1), in **Mode** select <u>Under reset</u> (step 2) and then click on <u>Connect</u> (step 3) (Figure 82).

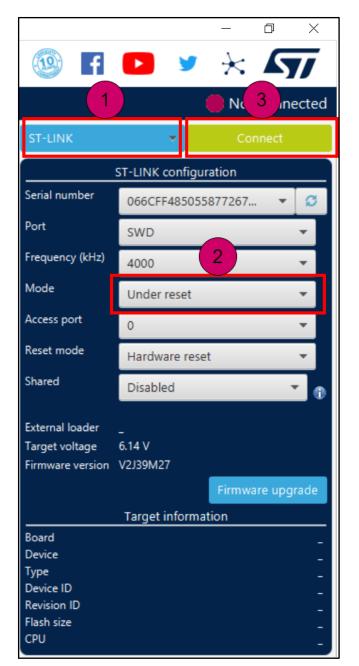


Figure 82. Connect to SensiLoRa 2.0



4. If the connection was successful, then we should see information about the controller and the status must be **Connected** (Figure 83).

STM32	CubeProgrammer								- 0 >
TM32 Cube	Programmer							🧐 🚺	🕒 🎽 🛪 🏹
	Memory & File	edition							Connected
	Device memory	Open file +						ST-LINK	<ul> <li>Disconnect</li> </ul>
•	Address 0x0800	0000 🔻 Size	0x400	Data width	32-bit 🔻 Find	Data Ox	Read 🔹	Serial number	ST-LINK configuration
	Address	0	4	8	с	ASCII		Port	066CFF485055877267 •
B	0x08000000 0x08000010	20005000	08019FED	08019771 00000000	08019773	.P. 1qs	Ô	Frequency (kHz)	4000
יט	0x08000010	00000000	00000000	000000000000000000000000000000000000000	08019777			Mode	Under reset
	0x08000030 0x08000040	00000000 0801A03D	00000000 0801A03D	08019779 08019761	0801977B 0801A03D	y{ ==á=		Access port	0
<u> </u>	0x08000040	0801A03D	08019785	0801971 0801975D	080197A9	==a= =©		Reset mode	Hardware reset 🗸
G	0x08000060	0801A03D	0801A03D	08019701	0801A03D	==Å=	~	Shared	Disabled 🔹
	< [ Log			•		Verbosity level	1 2 3	External loader Target voltage	
	18:39:22 : Bank 18:39:22 : Address 18:39:22 : Size	: 0x01 : 0x1ff80000 : 20 Bytes					^ <b>4</b>	Firmware version	
	18:39:22 : UPLOADIN 18:39:22 : Size	G : 1024 Bytes						Board	Target information
)	18:39:22 : Address 18:39:22 : Read progr 18:39:22 : Data read s 18:39:22 : Time elapse	uccessfully	eration is: 00:00:00	.006				Device Type Device ID Revision ID	STM32L07x/L08x/L N Ox
?)							100%	Revision ID Flash size CPU	Re 192 Cortex-M

#### Figure 83. Connect successfully

5. After successfully connecting to the controller, select the tab **<u>Erasing & Programming</u>** (step 1) then click on the button **<u>Browse</u>** (step 2) a window will open where we have to specify the firmware file. Where to get the firmware file is described in <u>4.1 Install STM32CubeProgrammer</u>. Check the box for <u>**Run after programming**</u> (step 3) and click <u>Start **Programm...**</u> (step 4) (Figure 84).

#### Figure 84. Programming SensiLoRa 2.0

## **Getting started with**

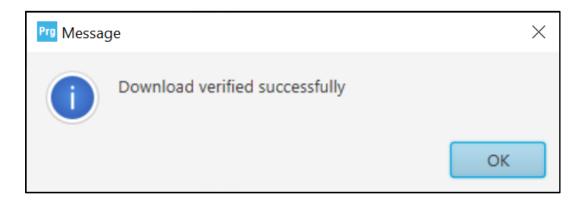


SensiLoRa 2.0

Pre STM32CubeProgrammer		- D	×
STM32 The CubeProgrammer		🚳 🖪 🕨 💆 🔆 🐬	7
Erasing & Programming		Connected	
Download	Erase flash memory Erase external memory	ST-LINK V Disconnect	
D:\SensiLora-2.0_V0.0.13.bin	Erase selected sectors Full chip er	erase Serial number 066CFF485055877267	ø
Start addr 0x08000000	Select Index Start Address Size		•
Skip flash erase before programming	0 0x08000000 128	Frequency (kHz)	•
CPU Verify programming	1 0x08000080 128	8 Mode Under reset	•
Run after programming	2 0x08000100 128	Access port 0	Ŧ
Start Program		Hardware reset	•
REG BETA Automatic Mode	4 0x08000200 128	Disabled •	
Full chip erase	5 0x08000280 128 6 0x08000300 128		
Download file	7 0x08000380 128	Target voltage 6.43 V	
Option bytes comman	8         0x08000400         128	Firmware version V2J39M27	ade
Log	Verbosity level	3 Target information	
18:58:03 : Address : Ux8000000 18:58:03 : Read progress:	^	Board Device STM32L07x/L08x/l Tune	 L010
18:58:03 : Data groupes: 18:58:03 : Data read successfully 18:58:03 : Time elapsed during the read operation is: 00:00:00.007		Type	MCU x447
		Revision ID R	Rev Z
	100%	Flash size 19 CPU Cortex-1	92 KB •M0+

6. After successfully loading the firmware, we should see the message Download verified successfully (Figure 85).

### Figure 85. Successful programming





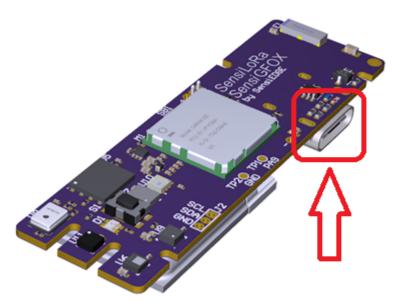
# 5.3 Flashing via USB Type-c

1. For flashing we will use such a program STM32CubeProgramming. First, we must disconnect the battery by disconnecting the jumper **J4** (Figure 82), then we must hold down button **S2** (Figure 86) and connect the cable **USB Type-c** (Figure 87) and after a couple of seconds we release the button, and the board enters the programming mode.

Figure 86. Jumper J4 and Button S2



Figure 87. Connect USB





2. In Device Manager should appear STM32 BOOTLOADER (Figure 88). If this does not happen, repeat step 1.

#### Figure 88. STM32 BOOTLOADER

🛃 Device Manager	_	$\times$
File Action View Help		
> 🚘 Disk drives		^
> 🖳 Display adapters		
> 🎽 Firmware		
> 🛺 Human Interface Devices		
> 🦷 IDE ATA/ATAPI controllers		
> 🚠 Imaging devices		- 10
> 🚽 Jungo Connectivity		
> 🔤 Keyboards		
> 🥅 Memory technology devices		
> 🕼 Mice and other pointing devices		
> 📲 Modems		
> 🛄 Monitors		
> 🖵 Network adapters		
> 🔮 Other devices		
> 🖃 Print queues		
> 🔲 Processors		
> 📲 Security devices		
> 📲 Software components		
> 📱 Software devices		
> 💐 Sound, video and game controllers		
> 🍇 Storage controllers		
> 🏣 System devices		
> 🏺 Universal Serial Bus controllers		
🗸 🏺 Universal Serial Bus devices		
STM32 BOOTLOADER		
		~

3. Open the program STM32CubeProgrammer select the <u>USB</u> (step 1) and then click on <u>Connect</u> (step 2) if the connection is successful, then we should see information about the controller (step 3) (Figure 89).

#### Figure 89. Connect via USB



SensiLoRa 2.0

Address 0x08000000 - Size 0x400 Data width 32-bit - Find Data 0x Read UART 1 gration Address 0 4 8 C ASCII	Memory & Fil	e edition							
Address       0x08000000       Size       0x400       Data width       32-bit       Find Data       0x       Read       UART       UART       USB         Address       0       4       8       C       Ascili       USB       UART       UART       UART       USB       UART	Device memory	Open file +							Connect 2
Address         0         4         8         C         ASCII           0x0800000         20005000         080045A1         08004039         08004038         .P. jE.9%.;%.         0TA         1647           0x0800000         00000000         0000000         000	Address 0x080	000000 👻 Size	0x400	Data width	32-bit 👻 Find	Data Ox	Read 🔹	1	g ration
0x08000000       20005000       080045A1       08004039       08004038       .P. ¡E. 9@;@         0x08000010       00000000       00000000       00000000	Address	0	4	8	с	ASCII			
0x08000010       00000000       00000000       00000000       00000000       00000000         0x08000020       00000000       00000000       0800403F	0x0800000	20005000	080045A1	08004039	0800403B	.P. ¡E9@;@	<u> </u>		1647304100
0x08000030         00000000         08004041         08004043        A&C&           0x08000040         080045F1         080040A9         080045F1         ñEñE         @x.           0x0800050         080045F1         08004040         08004055         08004071         ñEñE         @x.           0x0800060         080045F1         08004089         080045F1         ñEñE         @x.         @x.           0x0800060         080045F1         08004089         080045F1         ñEñE         @x.         @x.           16:15:07 : STM32CubeProgrammer API v2.7.0         16:15:09 : SMandr.ID : STMisza Beodt (2MBit/s)         #x.	0x08000010	00000000	00000000	00000000	00000000		Ч	PID	0xd 11
0x08000030       00000000       08004041       08004043	0x08000020	00000000	00000000	00000000	0800403F	?@		VID	0×0482
0x08000040         080045F1         080045F1         080045F1         nE0E0ENE           0x08000050         080045F1         0800404D         08004065         08004071         ñEMGeGqG           0x08000060         080045F1         08004089         080045F1         ñEMGeGqG           0x0800060         080045F1         08004089         080045F1         ñEMGeGqG           0x0800060         080045F1         08004089         080045F1         ñEGEQL.           0x0800060         080045F1         08004089         080045F1         ñEQL.           0x0800060         080045F1         080045F1         ñEQL.         ñE           16:15:09 :SN :: 164730410000         16:15:09 : NU version : 0x011a         ñE         ñE         ñE	0x08000030	00000000	00000000	08004041	08004043	A@C@			
Ox08000060         080045F1         08004089         080045F1         ñE@ñE           Log         Verbosity level         1         2         3           16:15:07 : STM32CubeProgrammer API v2:7.0         1         2         3           16:15:09 : US8 speed : Full Speed (12MBit/s)         1         3         3           16:15:09 : STMicroelectronics         6         4         5           16:15:09 : STMicroelectronics         16:15:09 : STMicroelectronics         6         6           16:15:09 : SN :: 164730410000         16:15:09 : SW version : 0x011a         6         6         6	0x08000040	080045F1	080045F1	080040A9	080045F1	ñEñE©@ñE		Read Unprotect (N	MCU)
Log         Verbosity level         1         2         3           16:15:07 : STM32CubeProgrammer API v2.7.0         Image: Compared and the second and	0x08000050	080045F1	0800404D	08004065	08004071	ñEM@e@q@			
Log         Verbosity level         1         2         3           16:15:07 : STM32CubeProgrammer API v2.7.0         16:15:09 : USB speed : Full Speed (12MBit/s)         16:15:09 : StM speed : Full Speed : Full Speed (12MBit/s)         16:15:09 : StM speed : Full S	0x08000060	080045F1	080045F1	08004089	080045F1	ñEñE@ñE	~		
16:15:07 : STM32CubeProgrammer API v2:7.0 16:15:09 : USB speed : Full Speed (12MBit/s) 16:15:09 : Manuf. ID : STMircoelectronics 16:15:09 : SN : 164730410000 16:15:09 : SN : 164730410000 16:15:09 : FW version : 0x011a						Manharaitu laural 🕥 1			
16:15:09 : UPLOADING OPTION BYTES DATA           16:15:09 : Bank         : 0x00           16:15:09 : Address         : 0x100           16:15:09 : Address         : 0x1080000	16:15:09 : USB spee 16:15:09 : Manuf. II 16:15:09 : Product I 16:15:09 : SN 16:15:09 : FW versio 16:15:09 : Device II 16:15:09 : UPLOAD 16:15:09 : Bank	d : Full Speed (12MBit ) : STMicroelectronics D : STM32_BOOTLOAE : 164730410000 on : 0x011a : 0x0447 NG OPTION BYTES DA' : 0x00	/s) ÞER				🗳	Targ	et information

4. After successfully connecting to the controller, select the tab **<u>Erasing & Programming</u>** (step 4) then click on the button **<u>Browse</u>** (step 5) a window will open where we have to specify the firmware file. Where to get the firmware file is described in <u>4.1 Install STM32CubeProgrammer</u>. After selecting the firmware file, press <u>Start Programm...</u> (Figure 90).

STM32CubeProgrammer TM32 CubeProgrammer					(	🕸 F 🖸	3 9	- • ×
Erasing & Programming								Connected
Download	^	Erase flash me	mory E	rase external memo	ory	USB	<b>•</b>	Disconnect
File path C:\firmware\SensiLora_863MHz_V0.1.bin	Browse		Erase se	elected sectors Fi	ull chip erase	Port	USB configura	ation 👻 😧
Start addr 0x08000000		Select	Index	Start Address	Size	Serial number		1647304100
Skip flash erase before programming			0	0x0800000	128	PID	0xdf11	
Verify programming			1	0x08000080	128	VID	0x0483	
Run after programming	6		2	0x08000100	128	Read Unprotect	: (MCU)	
	Start Programm		3	0x08000180	128 🗸		_	
Log		١	erbosity	level 💿 1	2 3			
16:22:34 : erasing sector 0740 @: 0x08017200 done					^ ~			

Figure 90. Programming via USB

SensiEDGE



5. After successfully loading the firmware, we should see the message Download verified successfully (Figure 91). After that, you can disconnect the device from the computer and return the jumper  $\underline{J4}$ .

STM32 Cube	<b>V</b> Programmer						19	f 🕨	¥ -}	× 57
	Erasing & Programming								•	Connected
	veniy programming Run after programming			Erase flash mer	mory	Erase external men	nory	USB	▼ USB configur	Disconnect
*		Start Programm		Era	ase sele	cted sectors Full	chip erase	Port	USB1	- Ø
OB	Automatic Mode  Full chip erase		- 1	Select	Index 0	Start Address	<b>Size</b>	Serial numbe PID	0xdf11	164730410000
CPU	V Download file				1	0x08000080	128	VID	0x0483	3
swv	Option bytes comman	Prg Message				× <sup>00</sup> 80	128 128	Read Unprote		-
	Download ve			uccessfully		00	128 ~			
	Log 13:02:16 : erasing sector 07:37 @: 0x08017080 done 13:02:16 : erasing sector 07:38 @: 0x08017180 done 13:02:16 : erasing sector 07:49 @: 0x08017180 done 13:02:16 : erasing sector 07:41 @: 0x08017280 done				(	ОК 2	3 ^ _			
	13:02:16 : erasing sector 0742 @: 0x08017300 done 13:02:16 : erasing sector 0743 @: 0x08017380 done 13:02:16 : erasing sector 0744 @: 0x08017400 done 13:02:16 : erasing sector 0745 @: 0x08017400 done 13:02:16 : erasing sector 0745 @: 0x08017500 done 13:02:16 : bownload in Progress:								Target inform	nation
(1)	13:02:26 : Fine download complete         13:02:26 : Time elapsed during download operation: 00:00:18:         13:02:26 : Verifying         13:02:26 : Read progress:         13:02:27 : Download verified successfully	707					Ũ	Board Device Type Device ID Revision ID	STM	 132L07x/L08x/L010 MCU 0x447 

#### Figure 91. Successful programming



# 6 Battery power

## 6.1 Overview

1. SensiLoRa 2.0 integrating **SILA-UCR** (LoRa) and **SIFA-UCR** (Sigfox). Same hardware but different Software Firmware. Every board comes with a Rechargeable battery of 100mA. The battery is soldered but disconnected until the user closes the jumper. Install a jumper in J4 to operate the device on battery power (Figure 92).

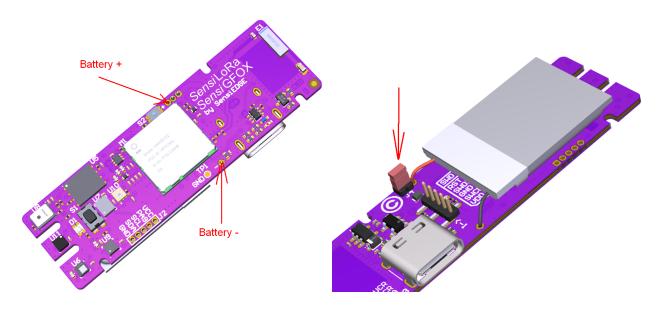


Figure 92. Battery power

Warning: During USB charging additional heating is influenced by Temperature and Pressure sensor. Be advised to use the measurement of those sensors only from battery operation.

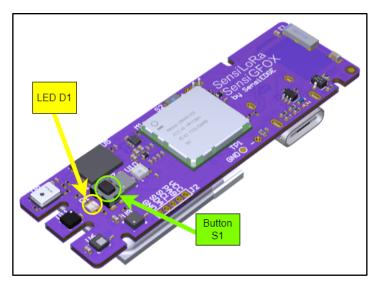


# 7 Turn on/off SensiLoRa 2.0

# 7.1 Turn on board

1. The SensiLoRa 2.0 board automatically turns on when power is applied.

2. To start the board after turning it off, you need to press the button <u>**S1**</u> (Figure 93) once, and after that, the <u>**LED D1**</u> (Figure 93)should light up in red for a short period.



### Figure 93. Button and LED placement

## 7.2 Turn off board

1. to turn off the board, you need to hold down the button <u>S1</u> (at least 2 seconds) (Figure 93) until the <u>LED D1</u> turns green (Figure 93).

2. The green <u>LED D1</u> (Figure 93) should turn off after 2 seconds, after that the SesiLoRa 2.0 board goes into a deep sleep and stops sending data to the LoRa server.

3. In sleep mode, the SensiLoRa 2.0 device consumes minimal power from the battery. A fully charged battery will last for 30 days. To completely de-energize the SensiLoRa 2.0 board, you need to disconnect the battery by removing the jumper from the jumper  $\underline{J4}$ .



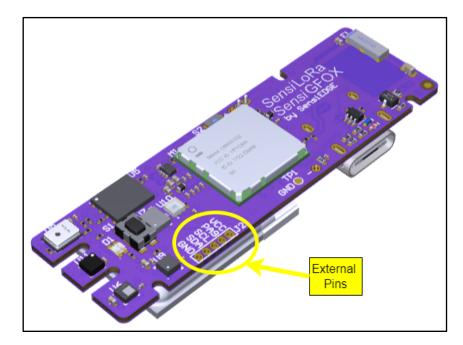
# 8 External pins

## 8.1 Overview

1. The SensiLoRa 2.0 board has a connector  $\underline{J2}$  for external connection (Figure 94), it has such pins:

- VCC 3.0 volt supply
- PA9 UART TX, for debug information
- **SCL** the clock signal for I2C
- SDA the data signal for I2C
- GND ground

#### Figure 94. External Pins

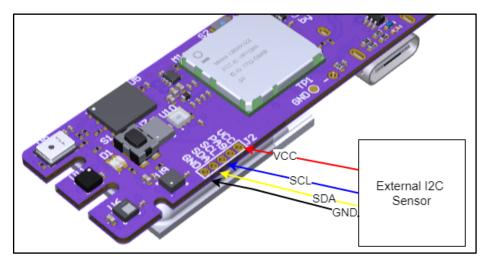




# 8.2 External I2C

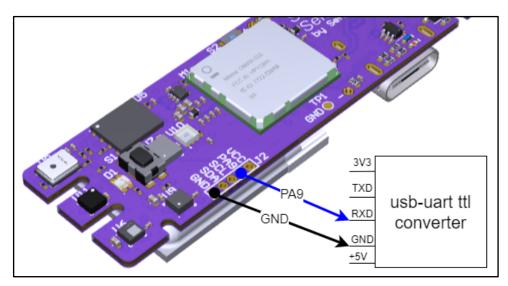
1. To connect an external sensor with an interface I2C for the SensiLoRa 2.0, you need to connect the sensor, as done in (Figure 95).

## Figure 95. Connect Sensor



# 8.3 Debug information PA9 pin

1. To see the debug information you need to use a **<u>usb-uart ttl</u>** <u>**converter**</u> and connect it to the SensiLoRa 2.0 (Figure 96).



#### Figure 96. Button and LED placement



2. Any Terminal can be used to display Debug information. In the **Port settings** in the Terminal, select the **USB TTL converter port** and other settings as in (Figure 97), then open the port.

Serial port sett	tings		
Port configur	ation		Olarea Ded
Port	COM7	~	Choose Port usb ttl converter
Baud rate	115200	~	
Data bits	8	$\sim$	
Stop bits	1	$\sim$	
Parity	none	$\sim$	
Flow control	none	$\sim$	
Forward	none	~	
User interface	language		

### Figure 97. Port Settings



3. When the board starts, the output of the information shown in (Figure 98) will begin. Also here you can see the keys: <u>AppKey, DevEui,</u> <u>and JoinEui(AppEui)</u>, which are used to connect the device to the LoRa server.

#### Figure 98. Debug Information

Disconnected - dick to connect	Settings	Clear	About	Close
	occurgo	Cicui	hour	CIUSE
APP_VERSION: V1.0.0				
MW_LORAWAN_VERSION: V2.3.0				
MW_RADIO_VERSION: V1.1.0				
####### AppKey: 2B:7E:15:16:28:AE:D2:A6:AB:F7:15:88:09:CF:4F:3C				
####### NwkKey: 2B:7E:15:16:28:AE:D2:A6:AB:F7:15:88:09:CF:4F:3C				
####### ABP #######				
####### AppSKey: 2B:7E:15:16:28:AE:D2:A6:AB:F7:15:88:09:CF:4F:3C				
####### NwkSKey: 2B:7E:15:16:28:AE:D2:A6:AB:F7:15:88:09:CF:4F:3C				
####### DevEui: 33:37:37:39:55:30:8A:16				
###### AppEui: 01:01:01:01:01:01:01:01				
###### DevAddr: 2F:33:07:26				
TX on freq 868300000 Hz at DR 0				
MAC txDone				
RX_1 on freq 868300000 Hz at DR 0				
MAC rxTimeOut				
RX_2 on freq 869525000 Hz at DR 0				
MAC rxTimeOut				
####### = JOIN FAILED				
TX on freq 868300000 Hz at DR 0 MAC txDone				
MAC IXDOILE				
				4