

FMB120 Getting Started with AWS IoT Core

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Document Information

Glossary

- FMB120 (tracker) – GNSS tracking device manufactured by Teltonika Telematics.
- Wiki – Teltonika IoT knowledge base - <https://wiki.teltonika-iot-group.com/>.
- FOTA – Firmware Over The Air.
- Configurator – Tool to configure Teltonika Telematics devices.
- Crowd support forum – knowledge base dedicated for Troubleshooting.

Revision History (Version, Date, Description of change)

Version	Date	Description
v1.5	2023.02.14	Links updated
v1.4	2022.12.19	Minor information update
v1.3	2022.11.29	Page created

Overview

FMB120 small and professional tracker with internal high gain GSM and GNSS antennas, which is able to collect device coordinates and other useful data and transfer them via GSM network to server. This device is perfectly suitable for applications where location acquirement of remote objects is needed: fleet management, car rental companies, taxi companies, public transport, logistics companies, personal cars and so on. FMB120 can perform tasks on remote objects, such as monitoring engine status, controlling truck's door etc.

Currently for MQTT solution evaluation firmware is required to be used - 03.27.10.Rev.520. For firmware supporting MQTT please contact your sales manager or contact directly via Teltonika Helpdesk.

Changes in firmware versions and update information can be found in device wiki page: [FMB120 firmware errata](#)

Hardware Description

DataSheet

FMB120 device data sheet can be downloaded here: [DataSheet](#)

Standard Kit Contents

STANDARD PACKAGE CONTAINS

- 10 pcs. of FMB120 trackers
- 10 pcs. of Input/output power supply cables (0.9 m)
- Packaging box with Teltonika branding

Teltonika suggest standard order codes for the device purchase, by contacting us, we can create special order code which would fulfill user needs.

More ordering information at: [Ordering](#)

User Provided Items

- Power supply (10-30V).
- MicroUSB to USB A cable.

Set up your Development Environment

Tools Installation (IDEs, Toolchains, SDKs)

FMB120 comes with our created firmware, therefore no additional development or scripting is required for this unit to support AWS IoT. Only by using Teltonika Configurator [FM Configurator versions](#), connection point of AWS IoT server is required.

Other software required to develop and debug applications for the device

For debugging situations, device internal logs can be downloaded OTA by using our [FotaWEB](#) platform or by using Teltonika Configurator.

Set up your hardware

All details about FMB120 can be located in our dedicated wiki page [FMB120 Wiki](#)

- Basic device startup instructions provided in [FMB120 First Start](#).
- Device characteristics, power supply information: [FMB120 General description](#)
- FMB120 firmware change can be performed via [FotaWEB](#) (direct buyer gets access to this platform) or via device [Configurator](#)
- Device LED information: [FMB120 LED Status](#)
- USB driver download, datasheet and quick start guide downloads: [FMB120 Downloads](#)

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- FOTA - Firmware Over The Air.
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For firmware supporting MQTT please contact your sales manager or contact directly via Teltonika Helpdesk.

Other software required to develop and debug applications for the device

For debugging situations, device internal logs can be downloaded OTA by using our [FotaWEB](#) platform or by using Teltonika Configurator.

Setup your AWS account and Permissions

Refer to the online AWS documentation at [Set up your AWS Account](#). Follow the steps outlined in the sections below to create your account and a user and get started:

- [Sign up for an AWS account](#)
- [Create a user and grant permissions](#)
- [Open the AWS IoT console](#)

Pay special attention to the Notes.

Create Resources in AWS IoT

Refer to the online AWS documentation at [Create AWS IoT Resources](#). Follow the steps outlined in these sections to provision resources for your device:

- [Create an AWS IoT Policy](#)
- [Create a thing object](#)

Pay special attention to the Notes.

Provide Device with credentials

Whole device, AWS IoT and testing information can be downloaded in PDF format [here](#).

NOTE: MQTT will not work without uploaded TLS certificates.

AWS IoT Core Configuration

Setting up AWS IoT Core

When logged in the AWS console, click on Services on the top left hand side screen, to access IoT core.

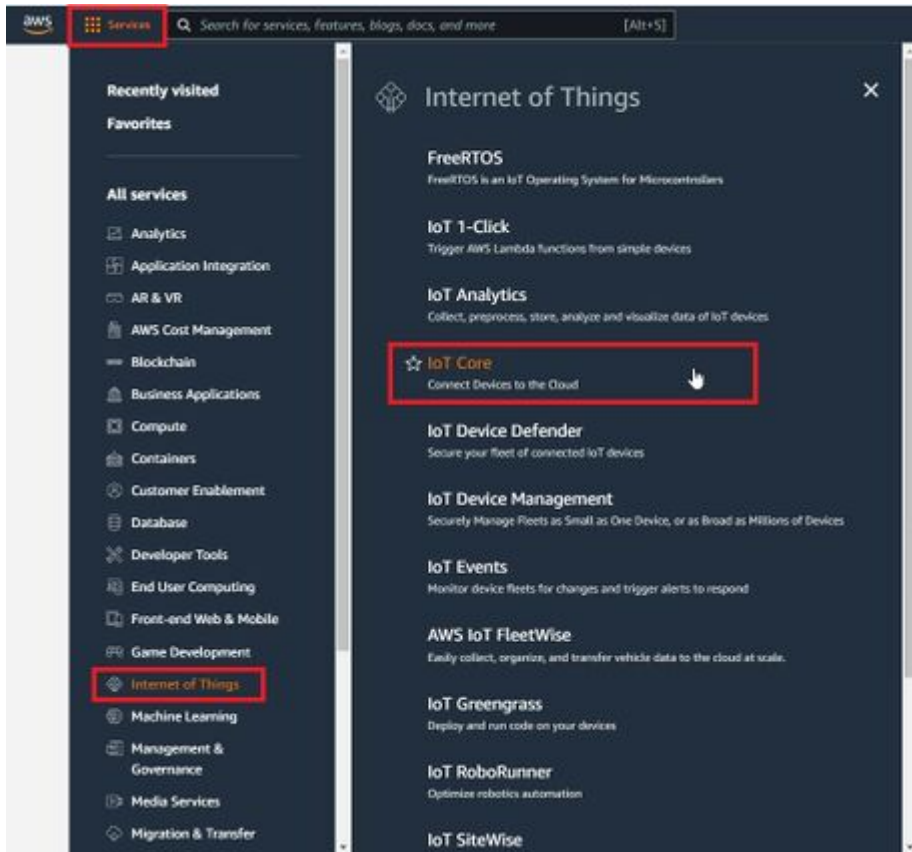


Figure 1. Accessing AWS IoT core from AWS console

NOTE: If you can't see "Services" in the top left, click on "My account" in the top right and "AWS Management Console"


Select Manage, Security, Policies (Manage > Security > Policies) and press Create policy or Create buttons. 

Figure 2. Accessing policy creation


In the Create Policy window, enter Policy name. In the Policy document tab for Policy Action (1) select "*" and for Policy resource (2) enter "*" and press create. 

Figure 3. Creating a policy


Now, that you have created a policy, select Manage on the sidebar on the left side, then select All devices, Things (Manage>All devices>Things). And click on Create things. 

Figure 4. Accessing Things

Afterwards select Create single thing and click Next.

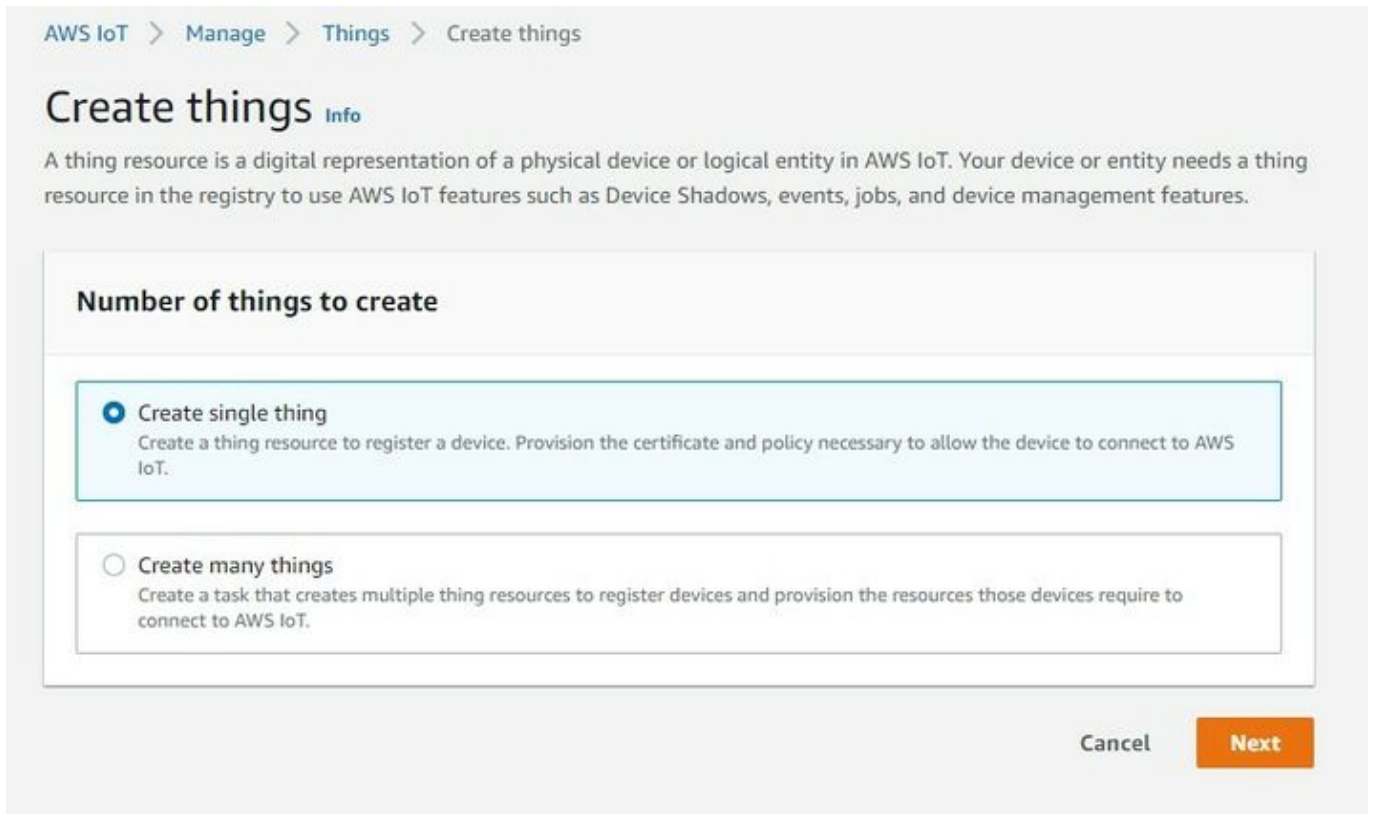


Figure 5. Creating single thing

After creating a single thing, enter Thing's name and in the Device Shadow tab select Unnamed shadow (classic). Then click Next.

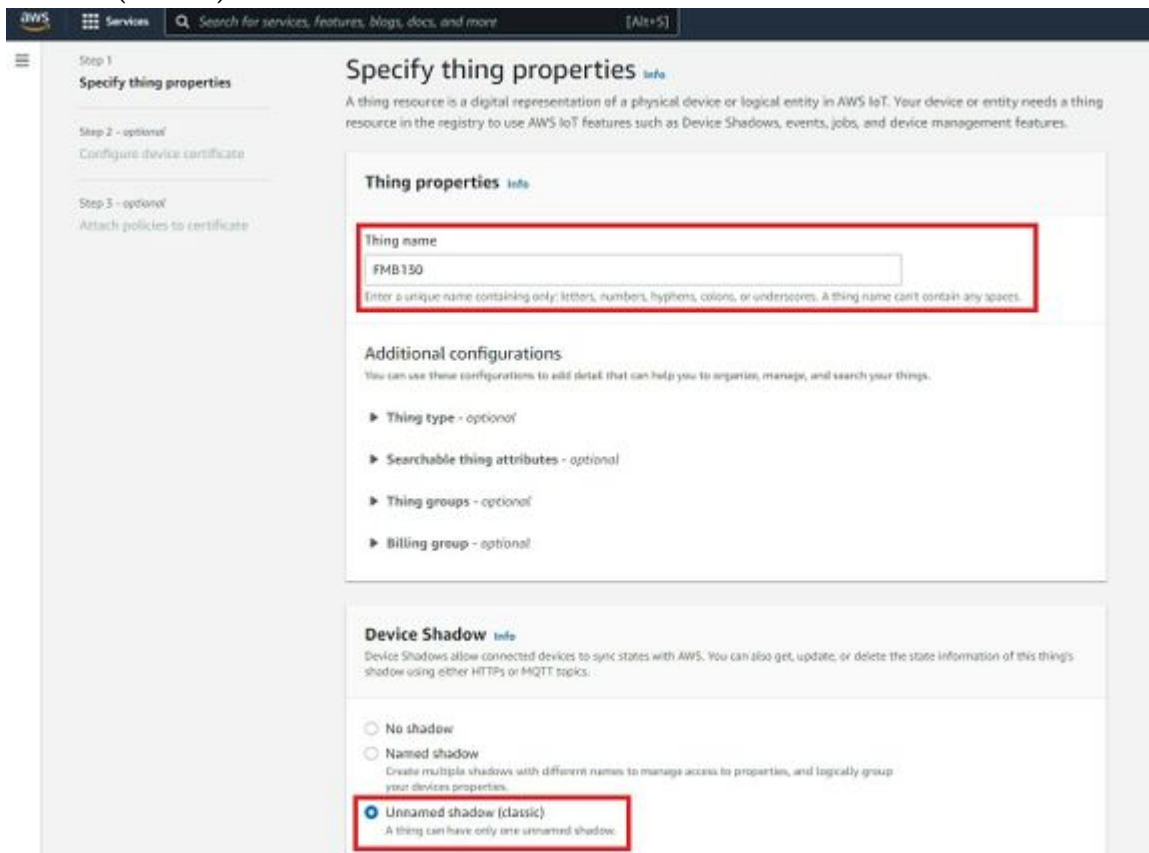


Figure 6. Thing's properties

Then when selecting Device certificate, select Auto-generate a new certificate and click Next.

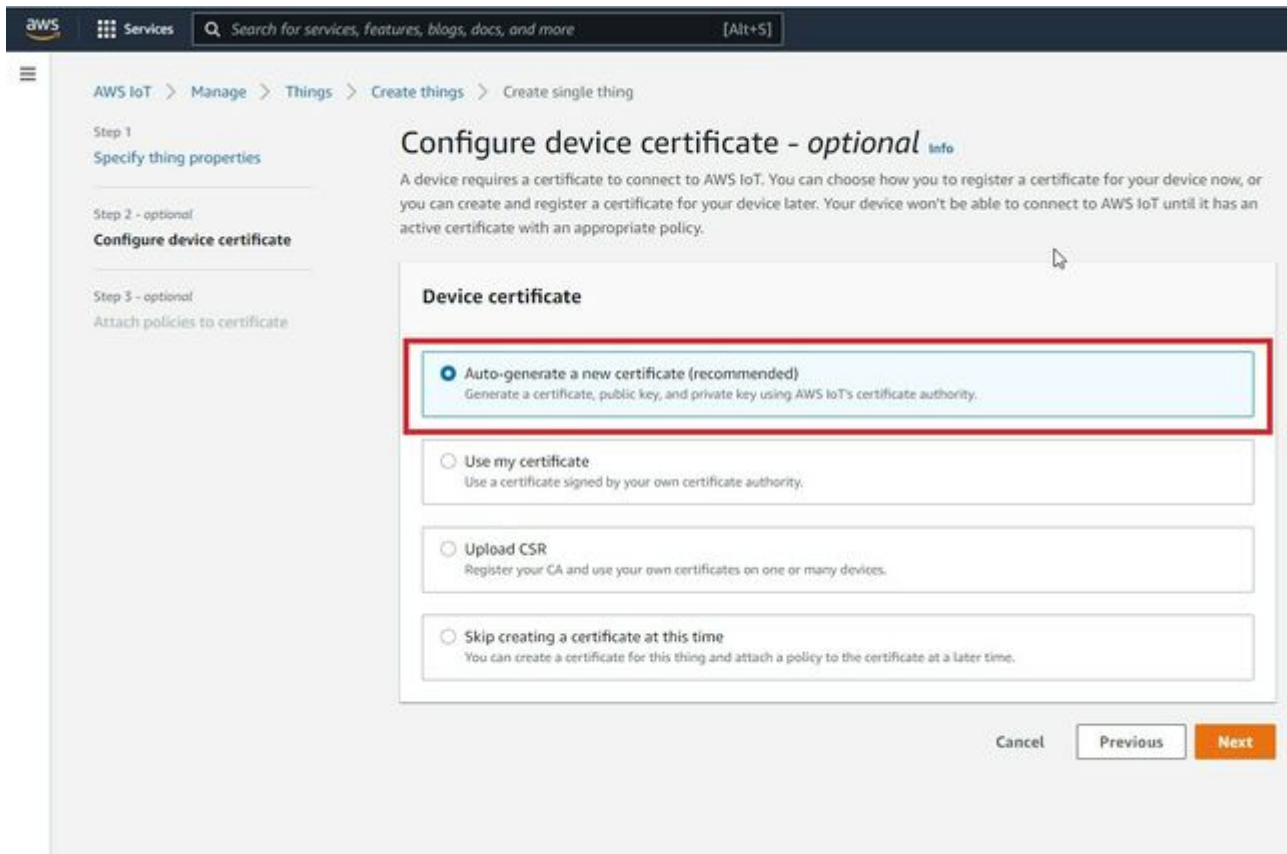


Figure 7. Certificate configuration

Now, select the policy you have created before to attach it to the certificate and thing. After that click Create thing.

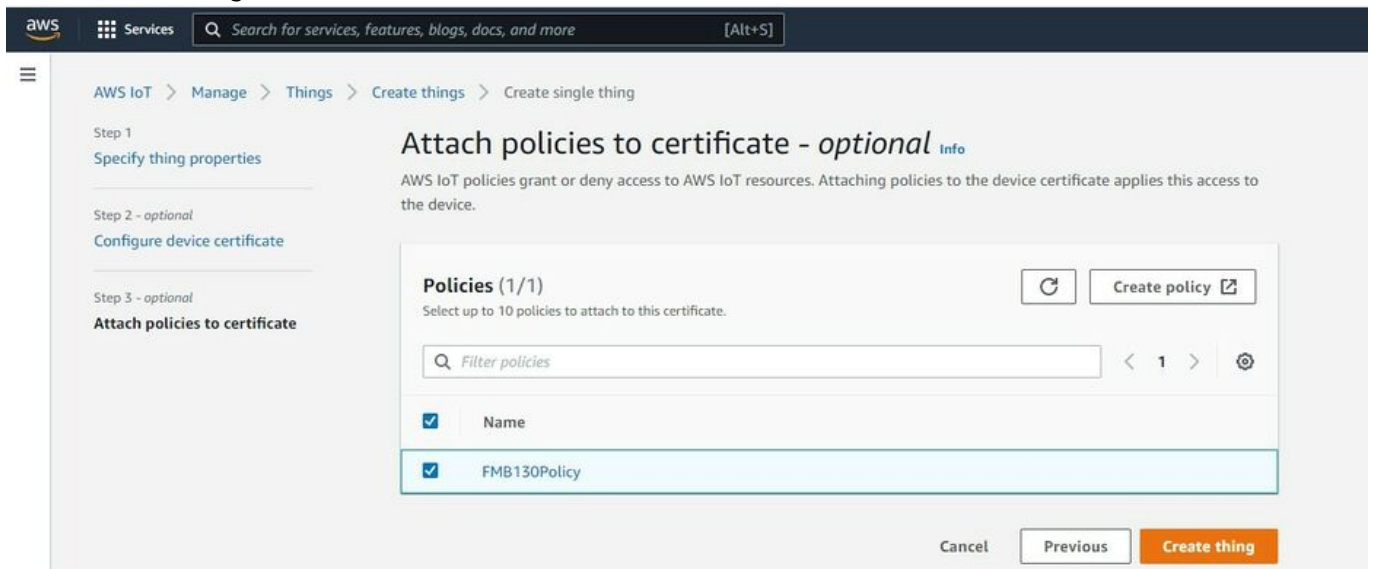


Figure 8. Attaching policy to certificate

Then window with Certificate files and key files download options should pop out. It's recommended to download all files, because later some of them will not be available for download. The files that are required for usage with FMX devices are: Device certificate (1), private key(2), and Amazon Root CA 1 file(3), but it's recommended to download them all and store them in secured place.

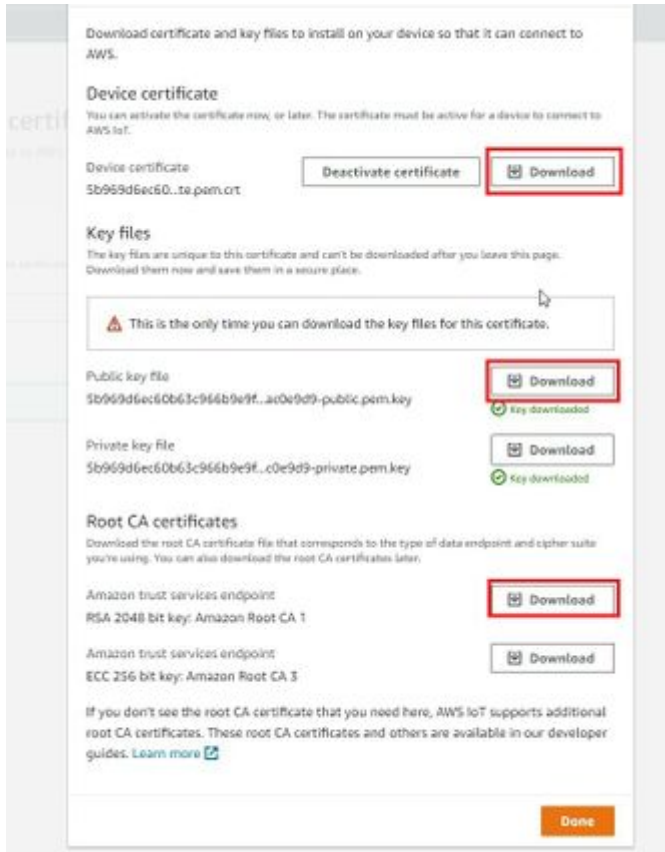


Figure 9. Certificate and key download

Finding device data endpoint (server domain)

To receive server domain (in AWS endpoint) click on the side bar on the left Settings (AWS IoT->Settings). Or click on the side bar on left side Things, select the created thing, after it click Interact->View Settings. Whole path - (Things->*YourThingName*->Interact->ViewSettings). Page containing endpoint will open. Copy the whole endpoint address. Port for accessing this endpoint is 8883.

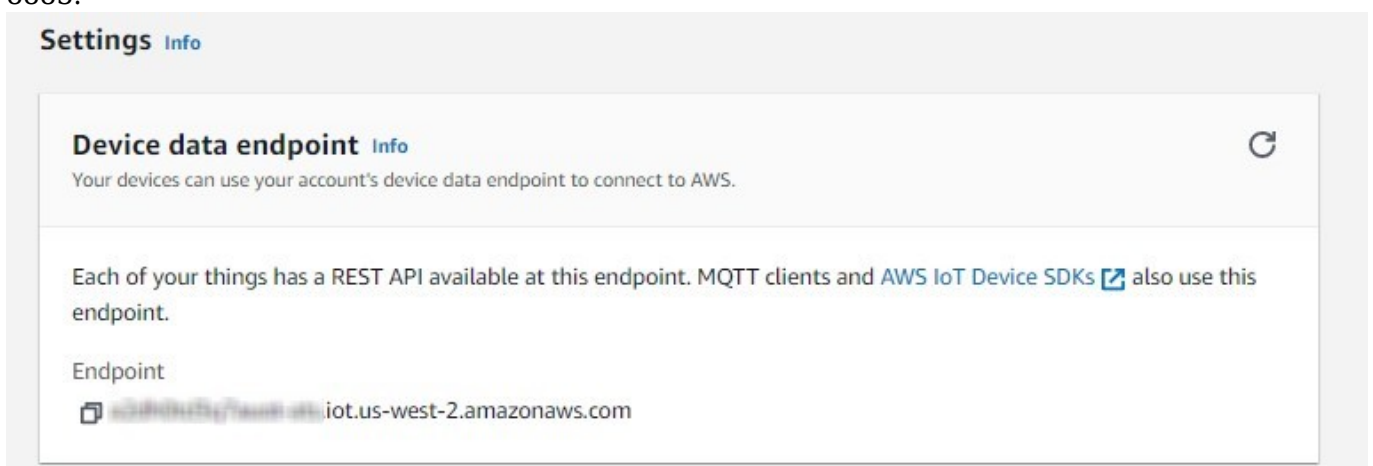


Figure 10. Device data endpoint

Merging certificates into a single file (FW Ver. 03.28.03.Rev.311)

Merger download: [Media:Crt_MRGs.zip](#)


NOTE: for FW Ver. 03.28.03.Rev.311 it is possible to upload a single merged file instead of 3 separate files. First, double click certificate merger to execute the program. 

Figure 11. Certificate merger


Then, a screen will pop out asking to select a certificate. Go to the folder with your certificate, private key and root certificate. Select the certificate. 

Figure 12. Selecting certificate

Another screen will pop out asking to select private key, so select private key. 

Figure 13. Selecting private key

Last screen will ask you to select the root certificate.



Figure 14. Selecting root certificate


After selecting the root certificate your files will be merged and a new “Merged” folder will appear inside your certificate folder. Inside it will be the merged_cert.pem. 

Figure 15. Merged folder



Figure 16. Merged file

Configuring the device

Security and certificates

Using certificate, private key and root certificate. (Via Cable)

Find Certificate file ending with extension pem.crt (ending may be just .pem) Private key file and AmazonRootCA1 file (no need to change filenames). These files should have been downloaded when creating Thing in AWS IoT Core.

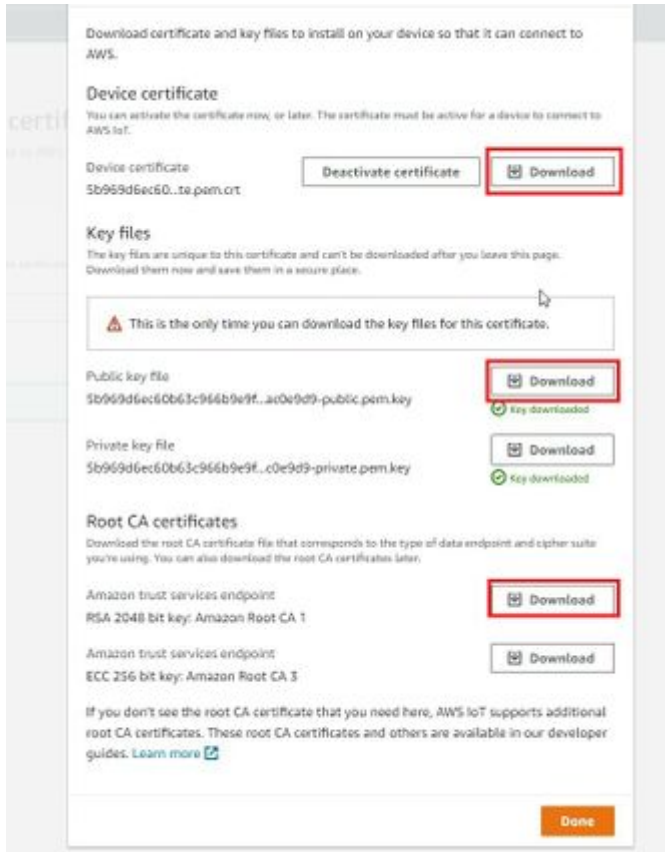


Figure 17. Certificate, private key and root certificate

Upload the mentioned files in the Security tab in the Teltonika Configurator.



Figure 18. Uploading certificates and keys

After uploading certificates, go to System tab and in Data protocol section select - Codec JSON.



Figure 19. Choosing data protocol

Using FW Ver. 03.28.03.Rev.311 and merged_cert.pem file. (Via FOTA WEB)


NOTE: uploading merged certificate file is only possible using FW Ver. 03.28.03.Rev.311. Open FOTA WEB and press devices side bar. Then select a device you want to upload merged certificate to and press create task. 

Figure 20. Selecting device

A "Create task" window will pop up. Select task type "Transfer user TLS certificate". Press "Upload new file" to upload your merged certificate. If you already have uploaded the merged certificate skip the next step.



Figure 21. Creating task

"Upload file" window will pop up. Change file type to Certificate, choose your company, press select files, find the merged file you created in step 3 and double tap. Click "Upload" button. Another window may appear with uploaded file information, simply click "Close".



Figure 22. Uploading merged file

Now you should be back in "Create task" window. Select the certificate you have just created and press "Create".



Figure 23. Selecting certificate

Your task has been created and is now pending. 

Figure 24. Pending task

To have the task completed send an SMS command to your device:

<SMS login><space><SMS password><space><web_connect>

If you have no login or password your message should look like this:

„ web_connect“

This is how the merged certificate should look in configurator after upload:



Figure 25. Uploaded merged certificate

After uploading certificates, go to System tab and in Data protocol section select - Codec JSON.



Figure 26. Choosing data protocol

Device GPRS configuration for AWS IoT Custom MQTT settings

In the GPRS tab, under Server Settings select:

1. Domain - Endpoint from the AWS, Port: 8883
2. Protocol - MQTT
3. TLS Encryption - TLS/DTLS

In the MQTT Settings section select:

1. MQTT Client Type - AWS IoT Custom
2. Device ID - enter device IMEI (optional)
3. Leave Data and Command Topics unchanged.

Save the configuration to the device.



Figure 27. GPRS Settings for MQTT AWS IoT

Checking received data and sending commands in the AWS IoT core


The data received from the device can be found in the MQTT test client, which can be found above "Manage" in the sidebar on the left. 

Figure 28. MQTT test client location

To see incoming data, subscribe to topic - *DeviceImei*/data . Or subscribe to # to see all incoming outgoing data in the Topics.

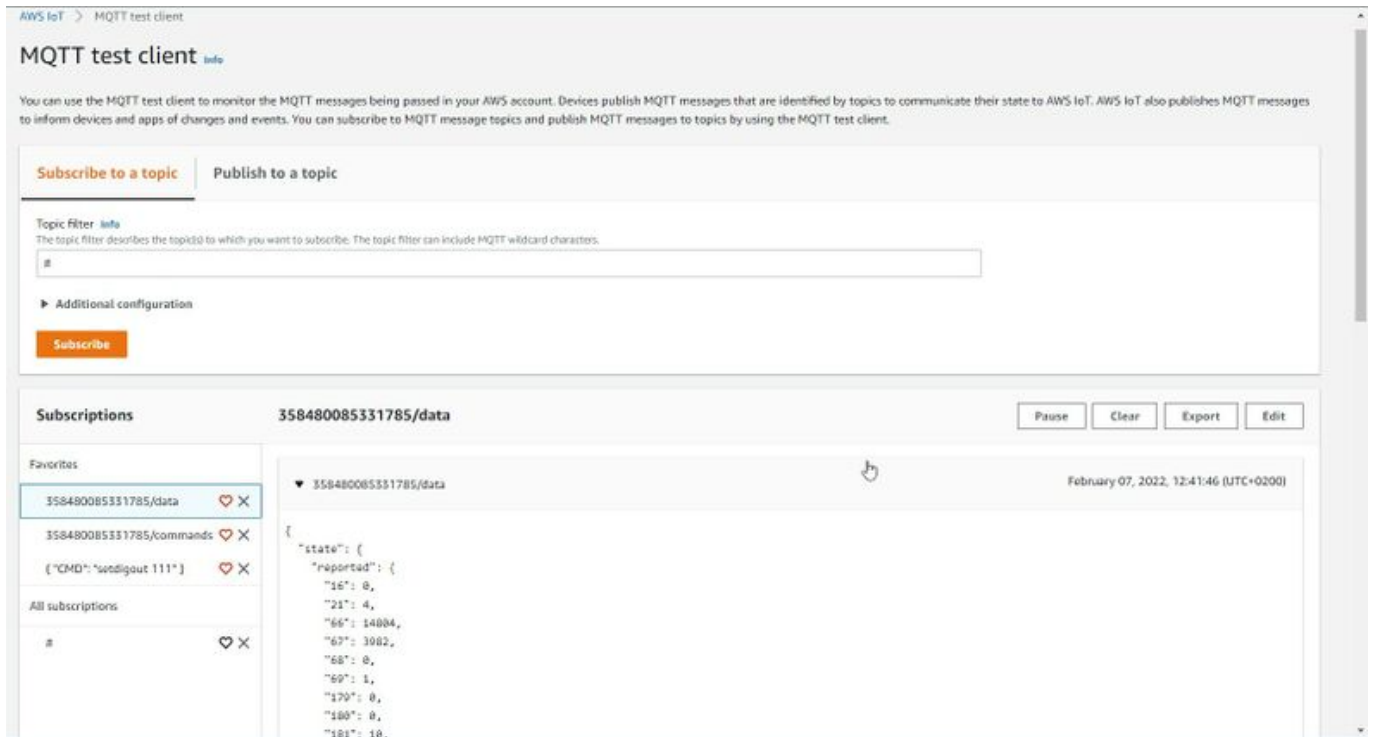


Figure 29. MQTT test client

Incoming data is received in JSON format, for e.g.:



Figure 30. Received data format

To send SMS/GPRS commands to the device subscribe to a topic name - *DeviceIMEI*/commands, and, in the same MQTT test client window select Publish to a topic. Enter topic name - *DeviceIMEI*/commands. In the Message payload enter wanted GPRS/SMS command in following format and press Publish:

{“CMD”: “<Command>”}

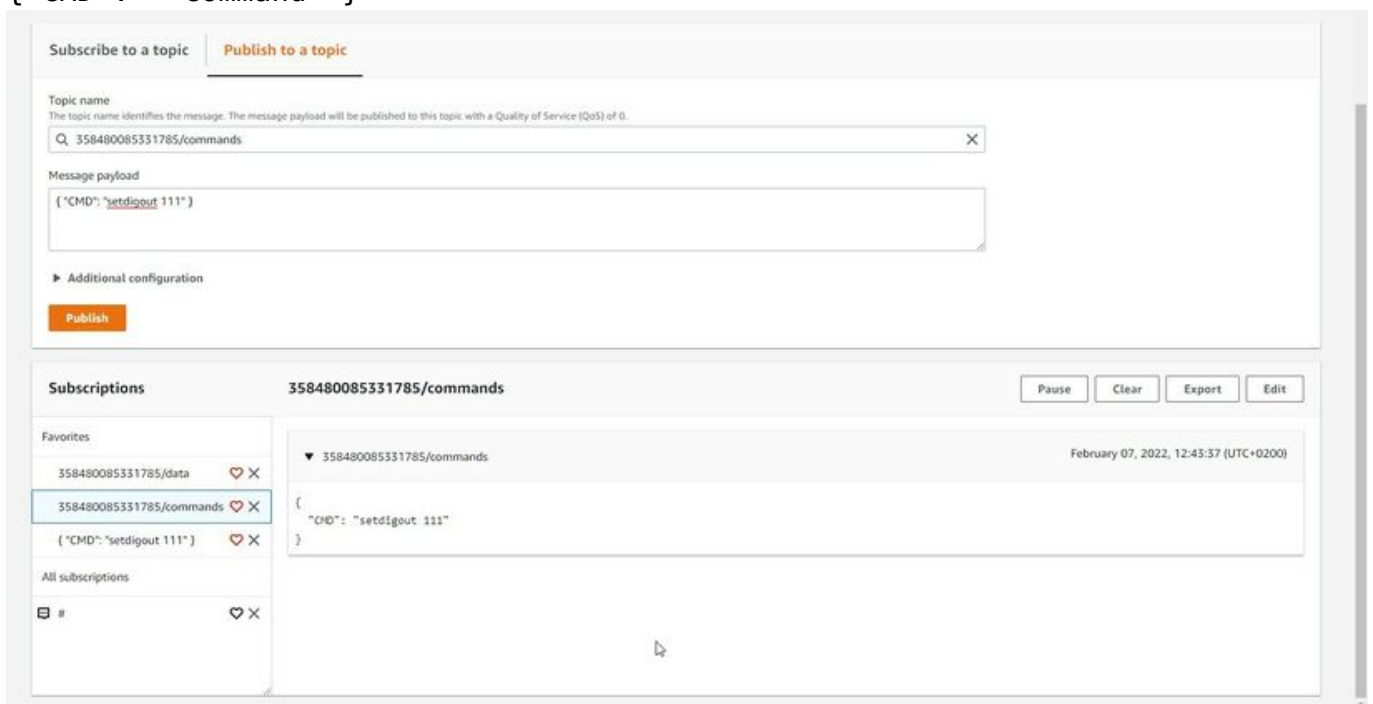


Figure 31. Sending Command in AWS IoT Core

The response to the command will be shown in the Data topic:



Figure 32. Response to a command in the data topic, the command was published in command topic

Debugging

In the situation when the issue with information upload appears, device internal logs can be taken directly from device configuration software ([instructions](#)), via Terminal.exe by connecting selecting device USB connection port, or by receiving internal logs via FotaWEB in [task section](#).

Troubleshooting

The information can be submitted to Teltonika HelpDesk and Teltonika engineers will assist with troubleshooting. For a more detailed information regarding what information should be collected for debugging, please visit the dedicated page on [Teltonika Wiki](#).

Alternatively, Teltonika has a [Crowd Support Forum](#) dedicated for troubleshooting, where engineers are actively solving problems.

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