# **Downlinks**

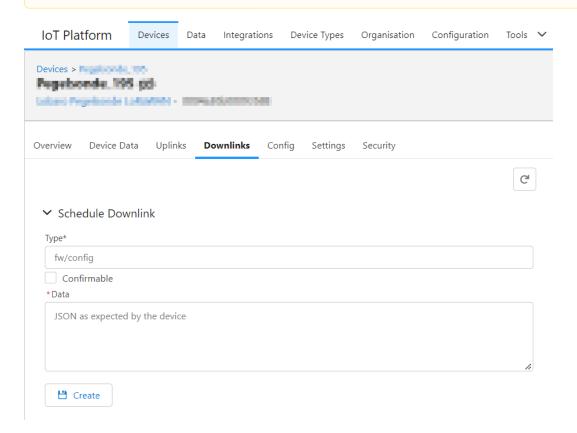


Roles: admin, org-admin, device-admin

Downlinks can be queued unter Device Downlinks or Devices Bulk Operations Downlinks



Currently only Platform Admins can Access the Interface on the Device. Org Admins and Device Admins must use the Bulk Operations as a workaround.



There are different downlink Types to be queued:

#### **Downlink Types**

Туре	Data (example)	Data
------	----------------	------

```
config

{
    "d": {
        "mFilter":
    "LOB",
        "listenCron":
    "0 0/20 * * * * *",

    "cmodeDurSec":
    "600"
    },
    "q": "config"
}

The JSON Format might be subject to change in future releases.
fw
```

The config values to be updated.

The application + secure boot firmware files to be downloaded by the device.

- app: Application firmware file ("device.app")
- boot: Associated matching secure boot firmware file ("device.boot")

† The firmware that works for remote firmware updates is uploaded to the platform by Lobaro. This is a different version than the one used via the USB adapter!

The JSON Format might be subject to change in future releases.

MA/

```
{
    "d": {
    "app": "app-
    firmware-1.x.x-
    mcuboot-slot1.
hex"
    },
    "q": "fw"
}
```

The JSON Format might be subject to change in future releases. Only the application firmware file to be downloaded by the device.

• app: Application firmware file ("device.app")

1. This is the faster (since less data has to be downloaded by the device) alternative of the firmware update command above and can be used if the needed "device.boot" firmware is already present in the device. The appropriate boot firmware version for a particular application firmware can be obtained from Lobaro. The currently installed boot firmware can be read from the device properties in the Lobaro platform.

If in doubt use the command above that updates both firmware images.

fw

```
fw
                                      Only secure boot firmware to be downloaded by the device.
                                        • boot: Associated matching secure boot firmware file ("device.boot")
           {
                     "d": {
           "boot": "app-boot-
                                      If in doubt use the command above that updates both application + secure boot firmware images.
           nrf9160-sec-TZ2-
           1.8.2-mcuboot-
           slot1.hex"
                     },
                     "q": "fw"
         The JSON Format might
         be subject to change in
         future releases.
fw
                                      Delta modem firmware update to be downloaded by the device.
           {
                     "d": {

    mfw: Associated matching delta modem firmware file provided by Nordic Semiconductor ("device.modem")

                                      Delta modem firmware updates can only be performed in small version steps. Please consult Lobaro for
           "mfw":
                                      available options.
           "mfw_nrf9160_updat
           e_from_1.3.2_to_1.
                                      Only newer Lobaro firmware support this type of update, e.g. app-nrf9160-wmbus+0.24.0 onwards.
           3.4.bin"
                     "q": "fw"
         The JSON Format might
         be subject to change in
         future releases.
                                      to insert a lorawan downlink over the platform a json object with the fiels type, data and fPort needs to be added.
Iorawan
             "data":
                                      TYPE: choose "base64", "hex" or "ascii" depending on the data content.
           "scmodeDurSec=15",
             "type": "ascii",
                                      data needs to contain the contet that is send to the device over the network server.
             "fPort": 128
                                      Details about data and the right fPort for Lobaro Devices can be found under: LoRaWAN Downlink Config
                                      ATTENTION: the downlinks will only be send if you have a default LoraWan Server defined under Integrations
                                      or the device is assigned to a loranwan server integration!
fw
             "q": "reboot"
           }
         The JSON Format might
         be subject to change in
         future releases.
                                      ASCII String that will be printed to device's Log.
fw
             "d": "ASCII
           string to print
           to log",
             "q": "comment"
         The JSON Format might
         be subject to change in
         future releases.
```

```
raw {
    format:
    "ASCII",
    data:
    "ascii-downlink-
payload"
    }

Lobaro NB-IoT Devices:
Config change:
```

Raw downlink data, with tyoe ASCII currently only supported for Tektelek devices.

Format: "cbor": meant for Lobaro Devices. The content JSON Object of "data" is marshaled to cbor and send to the device.

```
{
   "format": "cbor"
   "data": {
      "d": {

"cmodeDurSec": 123
      },
      "q": "config"
   }
}
```

#### reboot:

```
{
    "format": "cbor"
    "data": {
        "q":
    "reboot"
    }
}
```

## Raw Downlinks

### **Tekelek**

Scheduling TCP/IP downlinks for Tekelek devices.

You can schedule a downlink with the following content:

Type: raw

Data:

```
{
    format: "ASCII",
    data: "ascii-downlink-payload"
}
```

Currently only the format "ASCII" is supported.

## **Lorawan (additional Information)**

At the moment Chirpstack is the supported Lorawan Server for Downlinks.

Configure the Server under Integrations LoRaWan in you Platform instance and mark it as the default Server.

When you create a downlink it will be qued at the platform but only one downlink will be put into the downlink que of the chirpstack server at any time. Because there chirpstack will drop the queue on a device reconnect. This and other cases will leed to situations where we cant say if a downlink was send by chirpstack or not. For more information observe the information in the downlink tab of your platform for the device. (Or use the getDownlinks API Endpoint. The fields Completed and Error shall make clear if a downlink was send, an error occurred or it is unclear if the downlink was really send by the gateway. Always keep in mind that even a successfully send downlink not necessary was received by the device if it is an unconfirmed downlink.