LPWAN (LoRaWAN) Product order details

Pessl Instruments, GmbH

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Content

1. Purpose

To fulfill the order of LPWAN (LoRaWAN communication) product from Pessl Instruments, read through this document and fill in the necessary information.

Unfulfilled or missing data will be treated as standard settings which are set by default.

When this document is not provided, the ordered devices will be set up and provisioned with our TTN V3 application.

2. Order number

Please write the order number here: _____

3. Product configuration

3.1 Select Region

Select LoRaWAN region where you will use your product. Mark selection with X.

[ ] EU863-870

[ ] US902-928

[ ] AU915-928

[ ] AS920-923

[ ] AS923-925

[ ] RU864-870

In case AS920-923 or A923-925 is selected, select one of the following ISM bands:

	ISM Band	Frequency of Operation (Hz)
[ ]	ISM_AS923_BRUNEI	923000000 to 925000000
[ ]	ISM_AS923_CAMBODIA	923000000 to 925000000
[ ]	ISM_AS923_HONG_KONG	920000000 to 925000000

[ ]	ISM_AS923_INDONESIA	923000000 to 925000000
[ ]	ISM_AS923_JAPAN	920000000 to 928000000
[ ]	ISM_AS923_LAOS	923000000 to 925000000
[ ]	ISM_AS923_NEW_ZEALAND	915000000 to 928000000
[ ]	ISM_AS923_SINGAPORE	920000000 to 925000000
[ ]	ISM_AS923_TAIWAN	922000000 to 928000000
[ ]	ISM_AS923_THAILAND	920000000 to 925000000
[ ]	ISM_AS923_VIETNAM	920000000 to 925000000

3.2 Select RN2483/2903 LoRaWAN module settings

[ ] use the RN module with default settings[1]

[ ] set up the RN module with the TTN LoRaWAN provider settings[2]

[ ] set up the RN module with custom settings[3]

[1] The LoRaWAN RN module will be set as they come from the factory, no specific setup will be done, no upfront provisioning on our TTN V3 app will be done

[2] The device will be provisioned on the TTN V3 Pessl Instruments app and the RN module will be set accordingly

[3] Custom settings:

Check with your LoRaWAN provider and write all necessary configurations you wish to have configured on the product before it is shipped to you.

Setting parameter	Value

Clients can change these settings later via the TeraTerm menu manually on the RN module using the RN commands. Setting up custom settings is a subject of upfront agreement with Pessl Instruments.

Option [2] is the default state to which the devices will be configured if this document is not specifying otherwise.

3.3 LoRaWAN join process and keys

Our LoRaWAN products support the OTAA (Over the air activation) process. ABP is not supported.

3.3.1 OTAA process

the LoRaWAN product will come configured with default settings:

AppEUI: 70B3D57EF000676D

AppKEY: 4DA44D3AEB585485C374438937F6D540

Custom AppEUI and AppKEYs are possible. Clients can set up these values via the Teraterm app.

3.4 LoRaWAN network provider

3.4.1 Example of provisioning the device on your TTN V3 application

Provision (add) an end device (end devices are for example our lorawan weather stations) in your new TTN app.

The PI Serial number, DevEUI, AppEUI and AppKEY values are available via the TeraTerm app on every LoRaWAN motherboard, option 1 and L in the main menu.

Example for provisioning in EU1 cluster:

Steps:

- click Add end device button

- select Manually tab

info that you will need for provisioning:

Activation mode: OTAA

LoRaWAN version: MAC V1.0.2

Network server address: eu1.cloud.thethings.network

Application server address: eu1.cloud.thethings.network

Externa Join Server: not selected

Join server address: eu1.cloud.thethings.network

Basic settings:

End device ID: insert our PI Serial number of the device

AppEUI: insert the AppEUI value

DevEUI: insert the DevEUI value

End device name: insert our PI Serial number of the device

End device description: type your own description of the device

Network layer settings:

Frequency plan: if EU1 then select Europe 863-870 MHz (SF9 for RX2 - recommended)

LoRaWAN version: MAC V1.0.2 (already selected)

Regional parameters version: PHY V1.0.2 Rev B

LoRaWAN class capabilities: leave all unchecked

MAC settings: 32 bit

RX2 Data rate index: leave empty

RX2 frequency: leave empty

Join settings:

AppKey: insert AppKEY value

Home Net ID: empty

Application server ID: empty

Application server KEK label: empty

Network server KEK label: empty

3.4.2 Forwarding the data from the TTN V3

Connect your TTN app with our FieldClimate platform.

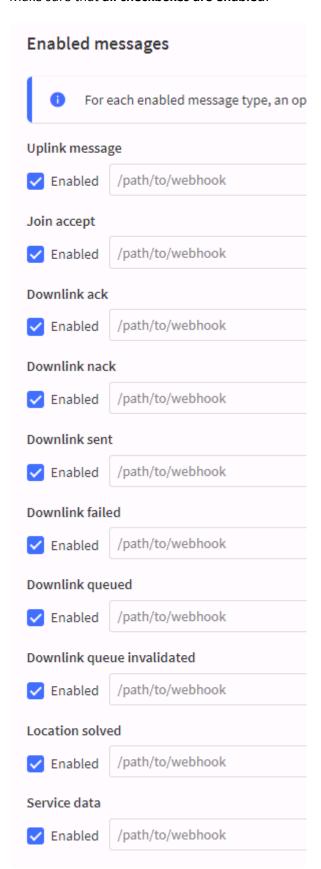On the left side of the TTN V3 portal, you have Integrations -> Webhooks.

Add a new webhook, use:

Webhook format: **JSON**

Base URL: http://lora.fieldclimate.com:1880/ttn_v3

Make sure that **all checkboxes are enabled**:

Enabled messages

ℹ️ For each enabled message type, an op

Uplink message

☑ Enabled   /path/to/webhook

Join accept

☑ Enabled   /path/to/webhook

Downlink ack

☑ Enabled   /path/to/webhook

Downlink nack

☑ Enabled   /path/to/webhook

Downlink sent

☑ Enabled   /path/to/webhook

Downlink failed

☑ Enabled   /path/to/webhook

Downlink queued

☑ Enabled   /path/to/webhook

Downlink queue invalidated

☑ Enabled   /path/to/webhook

Location solved

☑ Enabled   /path/to/webhook

Service data

☑ Enabled   /path/to/webhook

Now all data coming from all provisioned devices under your TTN application will be forwarded to our FieldClimate server.

3.4.3 Forwarding the data from the Actility platform
In this case forward the data to this HTTP listener: http://upload.fieldclimate.com/IoT/lora

3.4.4 Forwarding the data from other system
When data needs to be forwarded from another LoRaWAN network operator send an email to support@metos.at an example of the payload which will be forwarded and we will send you an appropriate HTTP POST listener URL address to where you should forward the data.

3.5 Confirmed/Unconfirmed data transmissions

Product can transmit confirmed or unconfirmed messages to the LoRaWAN network. By default, stations are set to send unconfirmed messages. If you want to use confirmed transmissions, tick the box below. Beware, some network operators charge extra for the confirmation packets sent through the network.

[ ] I want to use CONFIRMED message transmissions

This setting can be changed on the station in menu option L.

Custom integrations are addressed individually.

3.6 Measurement and transmission intervals

Default values for the Pessl Instruments LPWAN products:

Sensor measurement interval: 300 seconds (5 minutes)

Transmission interval: 900 seconds (15 minutes)

You can change these values at your own risk via the menu option on the product using the TeraTerm app but be aware that this can impact the battery lifetime of the product.

![Pessl Instruments logo]

4. Agreement

Pessl Instruments:

- is not a network providing company therefore does not take any responsibility for the LoRaWAN network status, availability, signal strength, gateway maintenance and any other related topic
- we use precertified RN modules for LoRaWAN connectivity,
  RN2483: https://www.microchip.com/wwwproducts/en/RN2483
  RN2903: https://www.microchip.com/wwwproducts/en/RN2903
  All necessary documentation for communication equipment import etc. can be found on the manufacturers website and if needed, the client needs to get necessary documents from Microchip website. We do not support unofficial firmware code on the mentioned RN modules.
- client order is checked before it goes into production, if this document is not fulfilled, Pessl Instruments can reject the order
- when product order details are not delivered with the order, Pessl Instruments can set up the station to be used by default with the TTN network
- all support is charged extra unless agreed otherwise on project's basis
- Pessl Instruments has no influence and takes no responsibility regarding the firmware used on the RN2483 or RN2903 modules. The RU864-870, AU915-928, AS920-925 are not officially supported by the Microchip so it is up to the client to check with the local regulators in their countries of deployment if the product satisfies their requirements.

Limitations:

- our LoRaWAN products cannot retransmit old data. When a data transfer fails, the data for that transmission interval is lost and cannot be retrieved. In case this is an issue, think about using GSM or NBIoT/CatM1 based stations.
- additional settings for the LoRaWAN connectivity can be done via bridge mode using the RN AT commands. If this is necessary, users can do this by themselves or with our help on a project basis.

Data payload structure:

- is a closed source and not publicly open. It can be negotiated on case by case situation
- when parsing is done on client's side, Pessl Instruments does not take any responsibility for data
- payload structures can be changed in future firmware versions without any prior or post notification

[ ] I agree with the stated facts

Name and surname: _____

Date: _____

Signature: _____