IMST GmbH

Carl-Friedrich-Gauß-Str. 2-4, D-47475 Kamp-Lintfort

iOKE868 LoRaWAN®

AN033 - Data visualization with TTN and TagoIO

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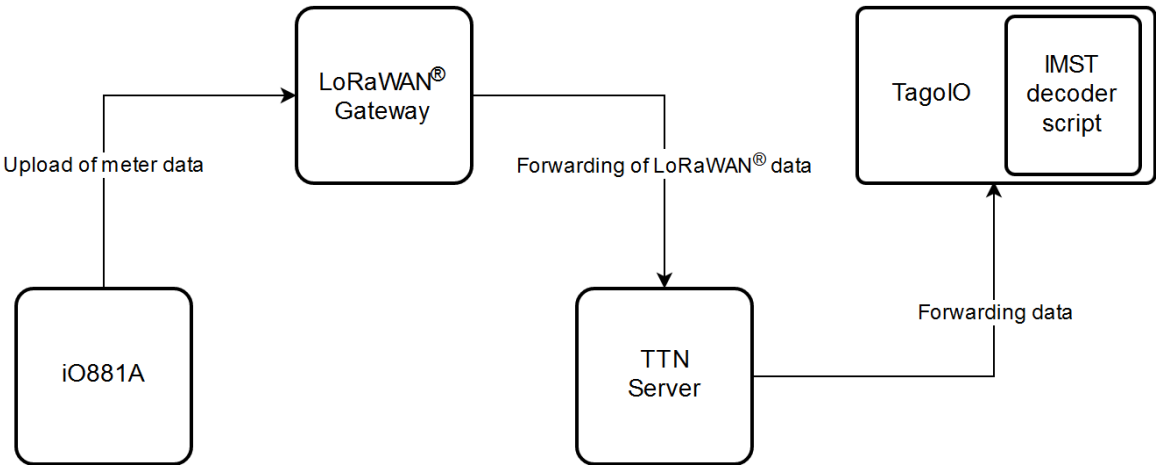
Content

General Information AN033

Aim of this Document

This is a simple guide on how the iO881A works with The Things Network (TTN) console and how the data of the iO881A can be easily visualized in TagoIO.



TTN is a LoRaWAN® network server platform. It offers an open network of LoRaWAN gateways and an open source concept to manage devices and applications.

TagoIO is a cloud platform for decoding and visualization.

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TTN

For using TTN an account must be created firstly. That can be done at https://account.thethingsnetwork.org/register.

The overview page can be used to find out whether a gateway is available in the area of the iO881A. If no gateway is available nearby, an own one should be set up. The IMST Lite Gateway is recommended as hardware.

Instructions for registering a gateway at TTN are available at https://www.thethingsnetwork.org/docs/gateways/registration.html.

Before a end device can be created in TTN, the corresponding application must first be added, if not yet available. An explanation for that can be found at https://www.thethingsnetwork.org/docs/applications/add.html.

As the last step in TTN, the end device has to be registered and that is how it works https://www.thethingsnetwork.org/docs/devices/registration.html.

Finally you have to configure the iO881A accordingly for TTN (app eui & keys).

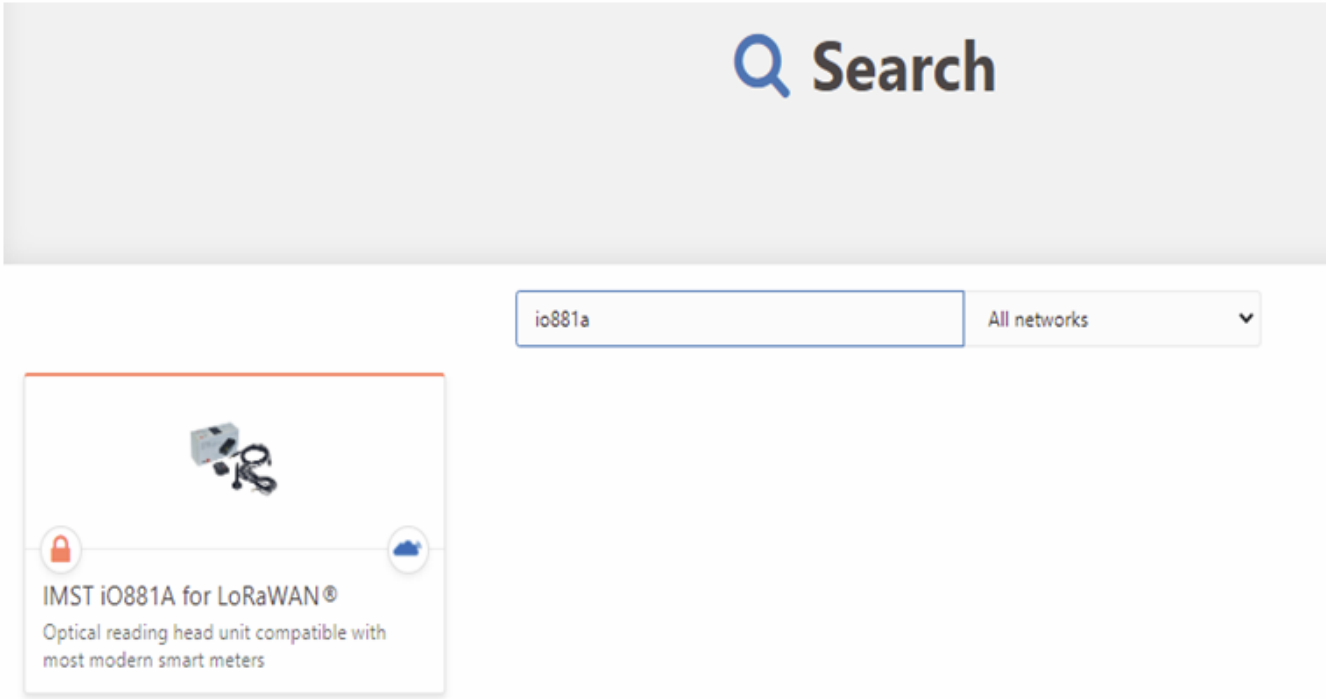
TagoIO

For working with TagoIO an account must also be created first. Signing up for free can be done at https://admin.tago.io/signup.

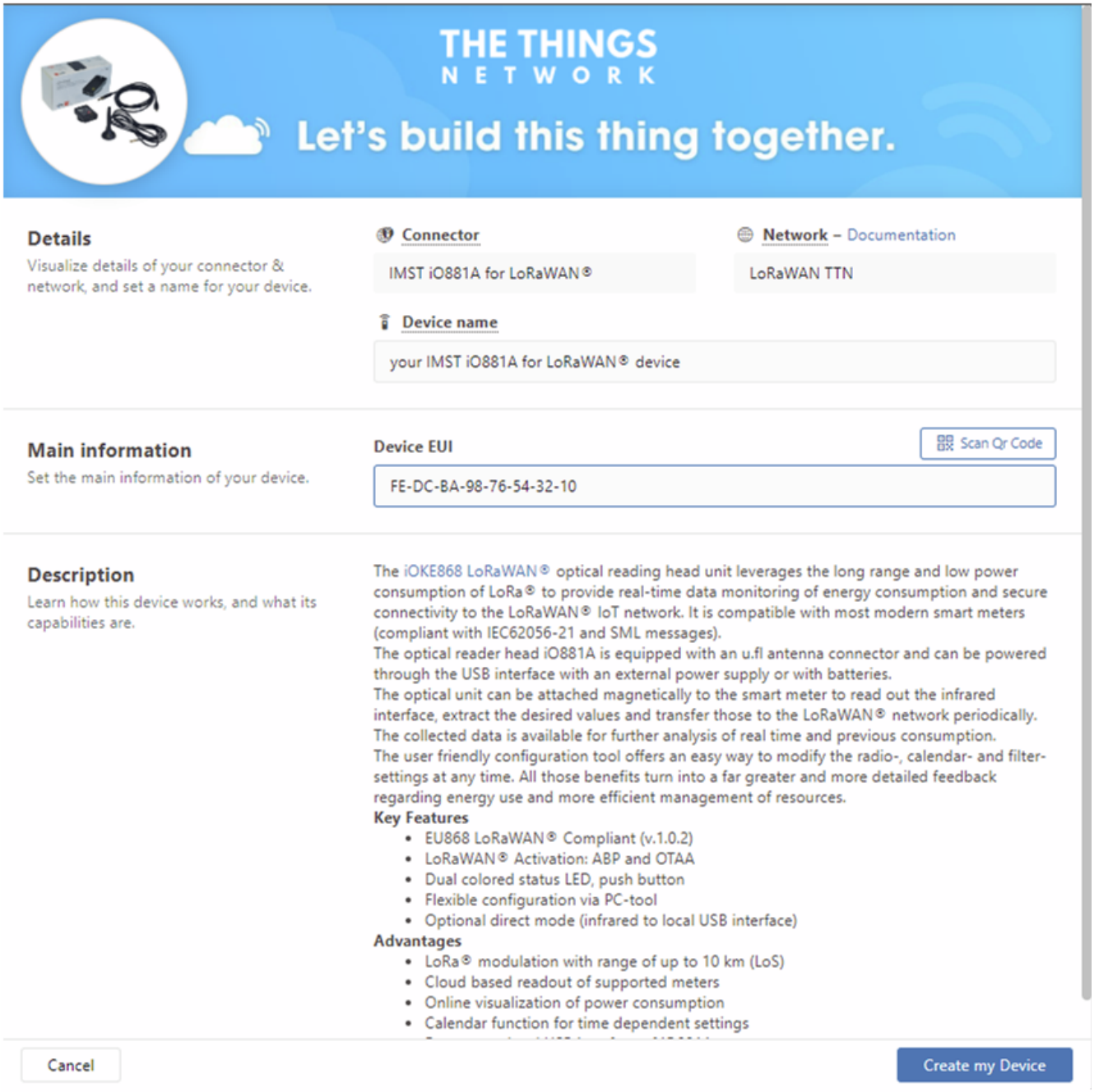
For a communication between TTN and TagoIO, an integration must be set up at TTN side and an authorization must be set up at TagoIO side. Please follow the instructions given on https://docs.tago.io/en/articles/218-authorization and https://docs.tago.io/en/articles/102-the-things-network-lorawan.

Next, the device, which was created at TTN must be added within TagoIO. A corresponding connector was created for the iO881A in TagoIO. This connector comes with a payload parser, which breaks down the received, non-segmented payload into its individual values.

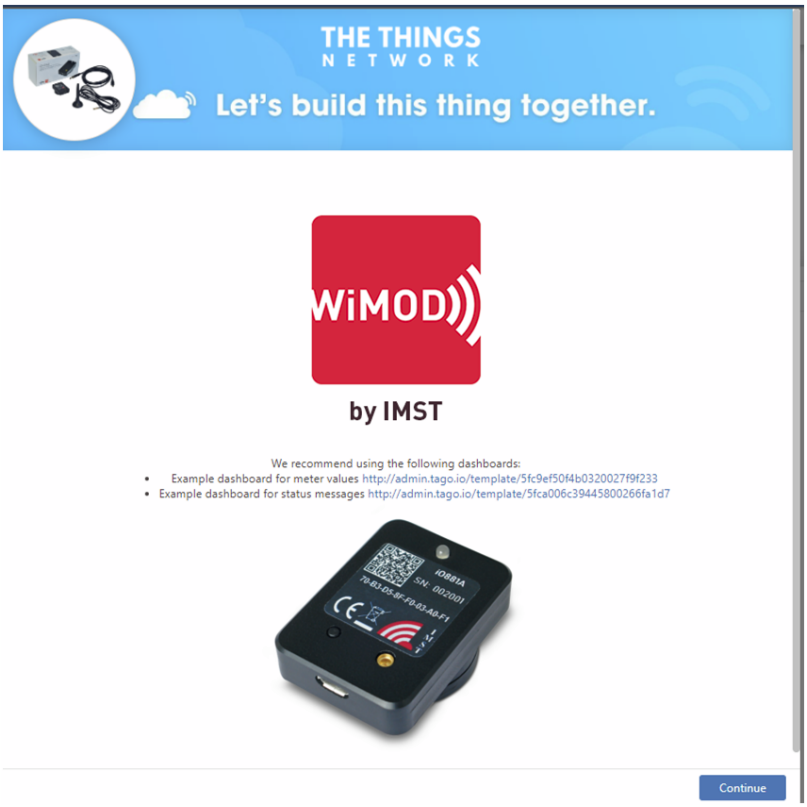
On adding the device, choose the corresponding connector 'IMST iO881A for LoRaWAN®'. It can be easily found through the search input:



A device name must be assigned and the Device EUI must be entered:

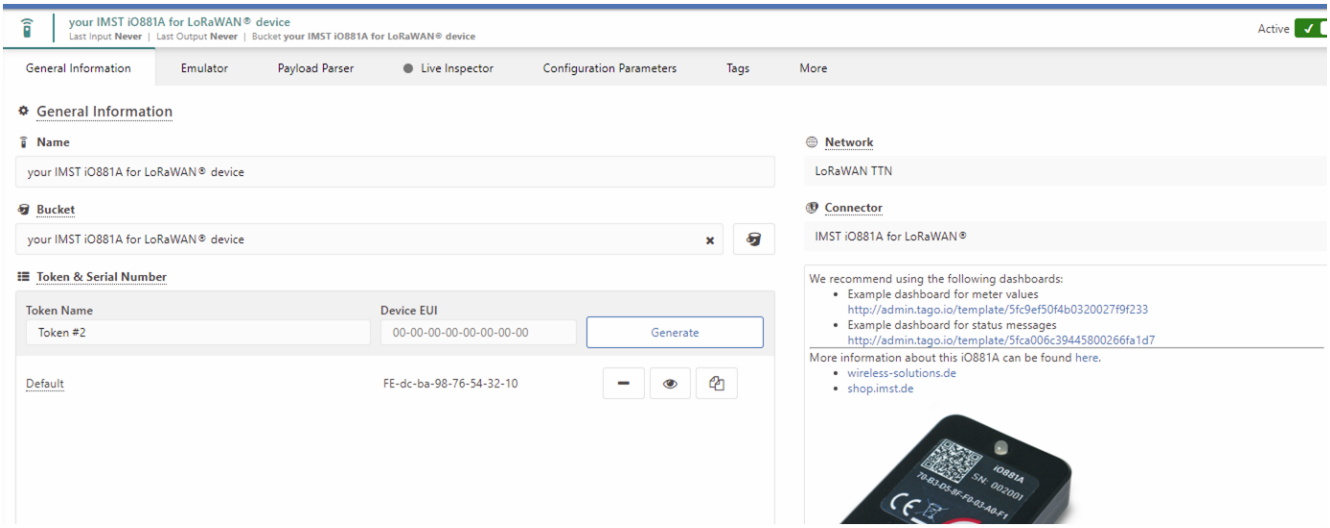


The successfully creation is signaled and two suggestions for *dashboards*, which can also be found later in the device overview, are given:



The subsequent note about generating an authorization can be ignored, because this should already have been carried out according to these instructions.

The newly created device and its information are available in the device overview. All packets received by TTN should now be forwarded to the TagoIO device and can be found in the '*Live Inspector*'.

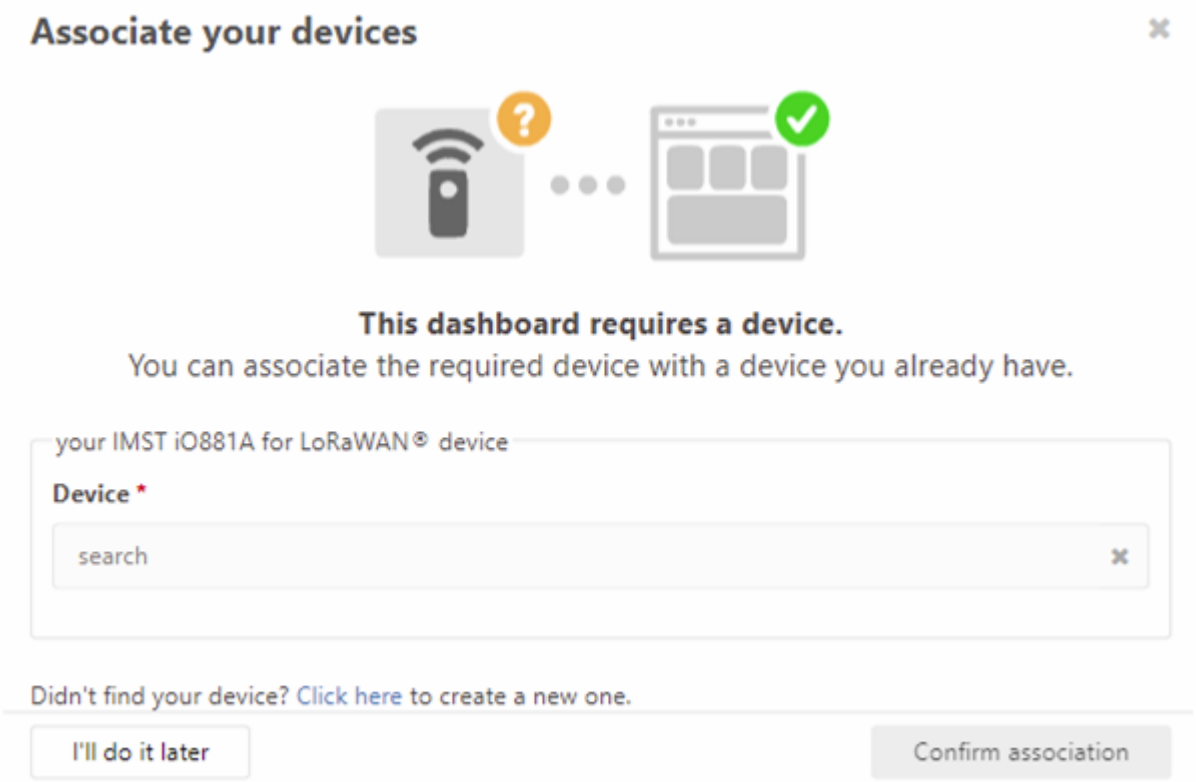


Using our example dashboards is recommended to try out dislpaying the data:

- Example dashboard for meter values
  http://admin.tago.io/template/5fc9ef50f4b0320027f9f233
- Example dashboard for status messages
  http://admin.tago.io/template/5fca006c39445800266fa1d7

For inserting a dashboard into an account, the corresponding link has to be clicked or the url has to be copied into the browser.

To associate the dashboard to the corresponding device, choose the name of the device from the drop-down list.



In the '*OBIS Values Example*' tab of the '*iO881A_OBIS_Values_Dashboard*' the graph and the table are designed for displaying the values of the OBIS ID '*1_0_1_8_0_255*'. This can be changed in the edit mode.

The dashboard is available and will display already received values and all following ones.

iO881A Configuration

The following documents are recommended for adjusting settings of the iO881A:

- iOKE868_LoRaWAN_AN031_QuickStartGuide
- iOKE868_LoRaWAN_UserManual
- WSConfigurator_UserManual_iO881A

Within LoRaWAN the possible maximum payload size of a LoRaWAN packet depends on the used data rate (spreading factor) during the transmission of the packet. Furthermore, within LoRaWAN an ADR (Adaptive Data Rate) algorithm is used. When a packet is transmitted as a confirmed data packet an adaptation of the data rate after the transmission of the packet can appear. This change in data rate might have an immediate impact on the possible maximum payload size that can be used within a LoRaWAN packet. Due to the nature of the application data to be transmitted, it might be necessary to spread larger application data into several LoRaWAN packets. So, uploaded application data might be segmented depending on the payload length and used data rate (maximum allowed payload size of a LoRaWAN packet). Those sequences of LoRaWAN packtes must be reassembled to complete application data on the receiving side again. In general application packets consisting of less than 36 bytes are not segmented during LoRaWAN transmission.

The reassembling of packets is not possible with the payload parser included in the connector of TagoIO.

However, in addition to parsing non-segmented payloads, the IMST payload parser also offers the option of parsing the first packet of segmented transmission. In this case an correspondig warning message is generated by the parser within the 'Live Inspector' view.

An interpretation of a segmented payload should be possible for the following lengths depending on the data rate:

DataRate		Payload Size
0	LoRa: SF12 / 125 kHz	36
1	LoRa: SF11 / 125 kHz	36
2	LoRa: SF10 / 125 kHz	36
3	LoRa: SF9 / 125 kHz	100
4	LoRa: SF8 / 125 kHz	207
5	LoRa: SF7 / 125 kHz	207
6	LoRa: SF7 / 250 kHz	207
7	FSK: 50 kbps	207

For all settings in the table above the given payload sizes can be 15 bytes larger, if the device does not have to send any further MAC commands within the same packet. In the case, that all raw data fit into one packet, a second message is always sent, which signals the end of segmentation - this should contain byte 0x81.

With an increasing number of OBIS IDs to be transmitted in one event, the payload length and thus the probability of segmentation also increases. Therefore it is recommended that only one OBIS ID is configured in one event. Different events should be selected for the transmission of several OBIS IDs, which should not overlap in time.