

How to store data on Mindsphere cloud

We will use a Mindconnect Node-RED node to store data on Mindsphere

As documented here

[node-red-contrib-mindconnect \(node\) - Node-RED \(nodered.org\)](#)

First you have to create some data on mindsphere

Assets, aspects and variables

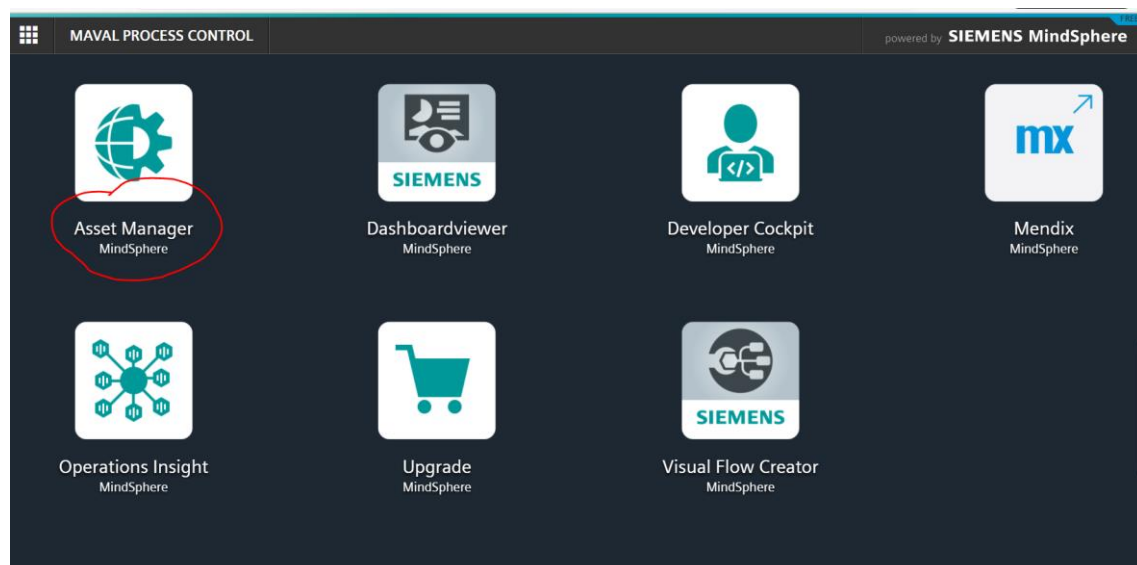
As explained here

[MindSphere – Como conectar um Raspberry PI ao MindSphere - YouTube](#)

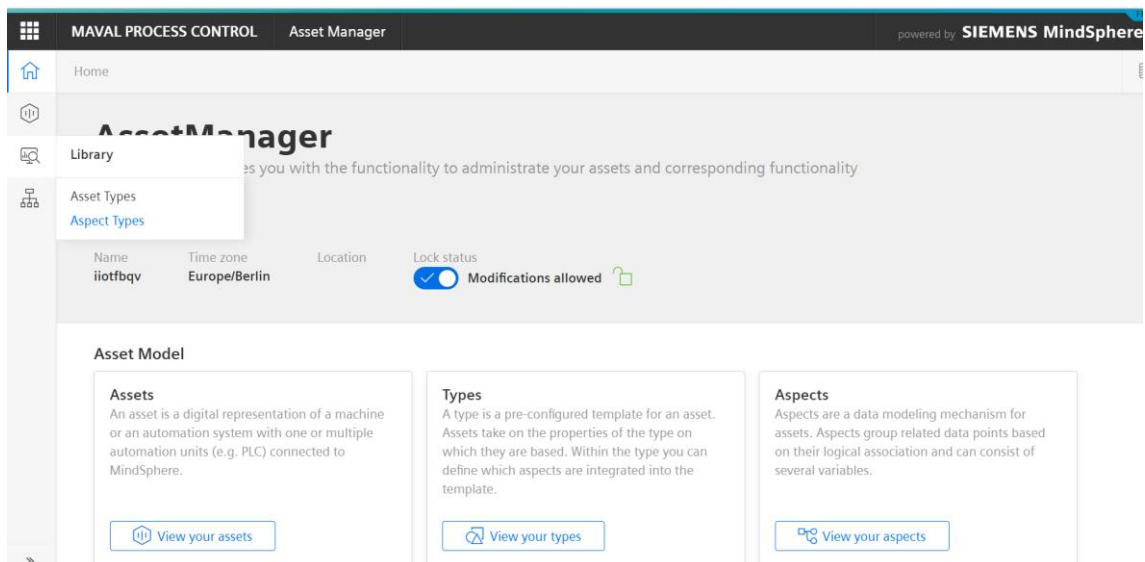
And here you see how to inject to Mindsphere

[MindSphere – Como utilizar o Visual Flow Creator \(NODE-Red\) no MindSphere - YouTube](#)

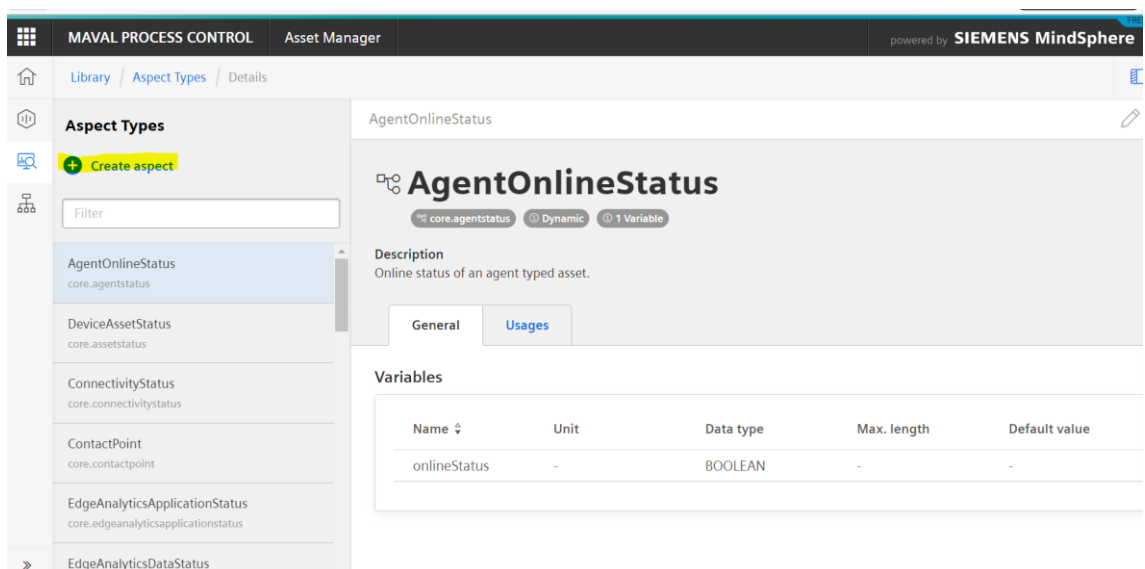
So let's create an Asset from Asset Manager



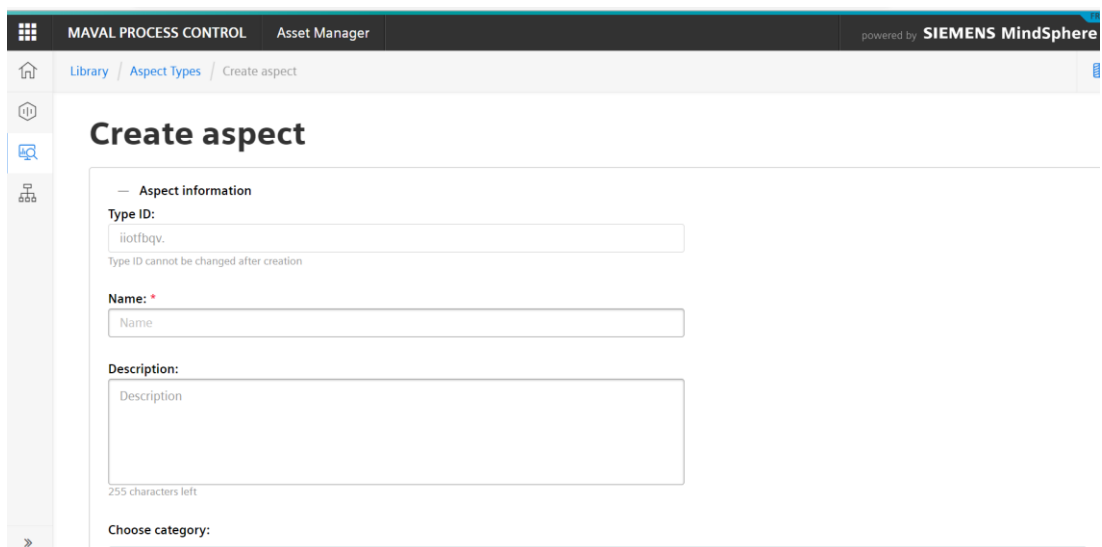
Let's create an Aspect (A set of variables) so the Asset will be a type of Aspect, so you can have several assets (for instance Edge machines) of same type, so you do not have to create a new one each time.



Let's create an Aspect



In this case called LoRaWAN_test



MAVAL PROCESS CONTROL Asset Manager powered by SIEMENS MindSphere

Library / Aspect Types / Create aspect

Create aspect

— Aspect information

Type ID:
iiotfbqv.LoRaWAN_test
Type ID cannot be changed after creation

Name: *
LoRaWAN_test

Description:
Description
255 characters left

Choose category:

Scroll down and add a variable

MAVAL PROCESS CONTROL Asset Manager powered by SIEMENS MindSphere

Library / Aspect Types / Create aspect

☒ Dynamic
The aspect is used for time-series data

☐ Static
The aspect is used for static data

— Variables

⚠ Please add at least one variable!

No variables entered yet
Add your first variable to your aspect

+ Add variable

MAVAL PROCESS CONTROL Asset Manager powered by SIEMENS MindSphere

Library / Aspect Types / Create aspect

ⓘ The category of an aspect cannot be changed afterwards.

☒ Dynamic
The aspect is used for time-series data

☐ Static
The aspect is used for static data

— Variables

ⓘ

- Variable names must be unique inside an aspect.
- The data type BIG_STRING is only available for a dynamic aspect.

+ Add variable ↗ Import variables ⬇ Download template ⬇ Export variables 🗑 Delete all new

Name	Unit	Data type	Max. length	
Name	Unit	Select...	Max. length	Defined

Save Cancel

Fill in (add more variables like humidity, pressure, etc) and click save

MAVAL PROCESS CONTROL Asset Manager powered by SIEMENS MindSphere

Library / Aspect Types / Create aspect

The category of an aspect cannot be changed afterwards.

☒ Dynamic
The aspect is used for time-series data

☐ Static
The aspect is used for static data

— Variables

- Variable names must be unique inside an aspect.
- The data type BIG_STRING is only available for a dynamic aspect.

+ Add variable ↑ Import variables ↓ Download template ↓ Export variables 🗑 Delete all new

Name	Unit	Data type	Max. length	
Temperatura_nevera	°C	DOUBLE	Max. length	Defined

Save Cancel

If you scroll down you will see the just created Aspect type: LoRaWAN_test

MAVAL PROCESS CONTROL Asset Manager powered by SIEMENS MindSphere

Library / Aspect Types / Details

Aspect Types

+ Create aspect

Filter

- sinumerikBasicMachineModel
core.sinumerikbasicmachinemodel
- SinumerikBasicMachineStatus
core.sinumerikbasicmachinestatus
- SinumerikBasicStartup
core.sinumerikbasicstartup
- acceleration
iiotfbqv.acceleration
- aspectDemoPumpData
iiotfbqv.aspectDemoPumpData
- LoRaWAN_test**
iiotfbqv.LoRaWAN_test

AgentOnlineStatus

AgentOnlineStatus

core.agentstatus Dynamic 1 Variable

Description
Online status of an agent typed asset.

General Usages

Variables

Name	Unit	Data type	Max. length	Default value
onlineStatus	-	BOOLEAN	-	-

Now you need to create an Asset Type, it will be an instance of predefined Aspect type

Let's select Asset Types

MAVAL PROCESS CONTROL Asset Manager powered by SIEMENS MindSphere

Library / Aspect Types / Details

Aspect Types

Library

Asset Types

Aspect Types

- sinumerikBasicMachineModel
core.sinumerikbasicmachinemodel
- SinumerikBasicMachineStatus
core.sinumerikbasicmachinestatus
- SinumerikBasicStartup
core.sinumerikbasicstartup
- acceleration
iiotfbqv.acceleration
- aspectDemoPumpData
iiotfbqv.aspectDemoPumpData
- LoRaWAN_test**
iiotfbqv.LoRaWAN_test

AgentOnlineStatus

AgentOnlineStatus

core.agentstatus Dynamic 1 Variable

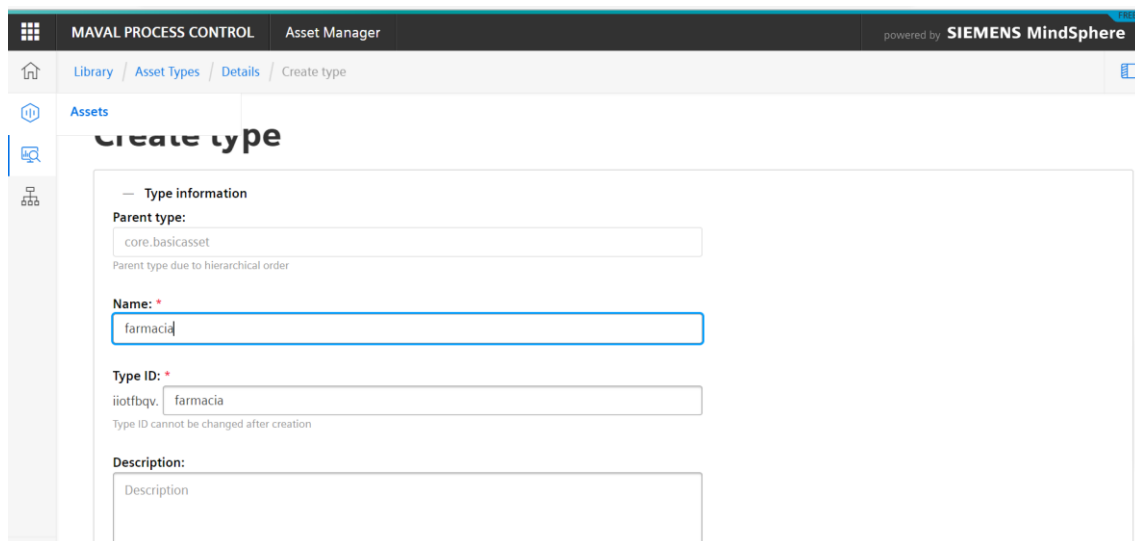
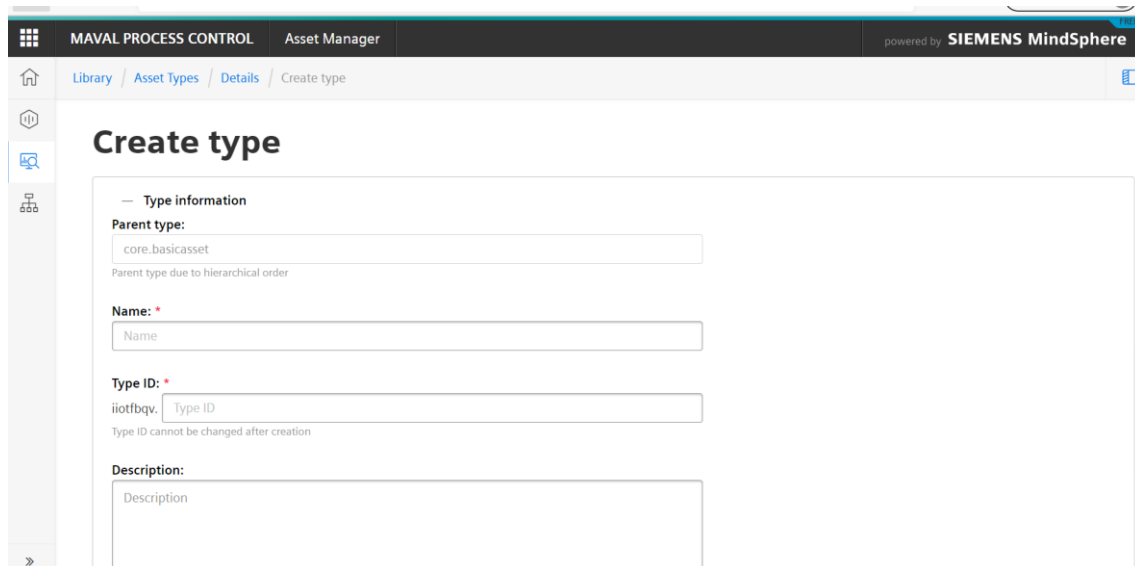
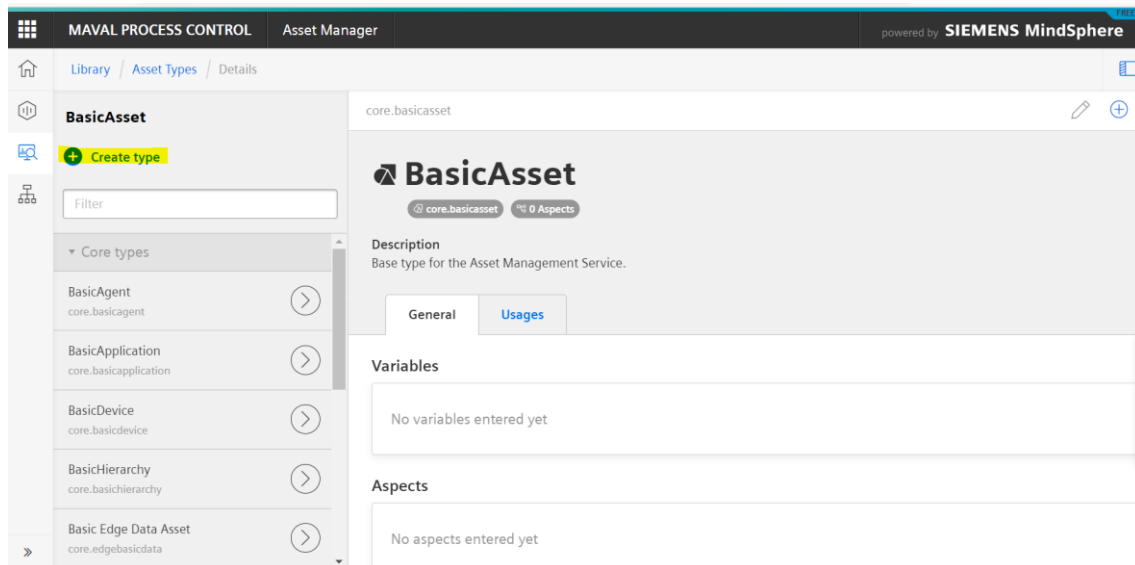
Description
Online status of an agent typed asset.

General Usages

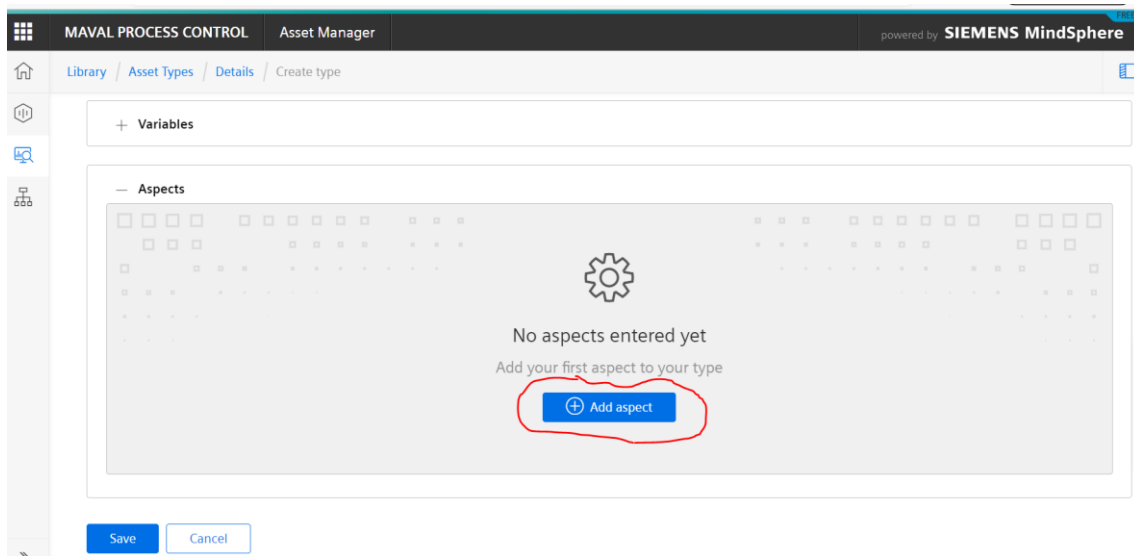
Variables

Name	Unit	Data type	Max. length	Default value
onlineStatus	-	BOOLEAN	-	-

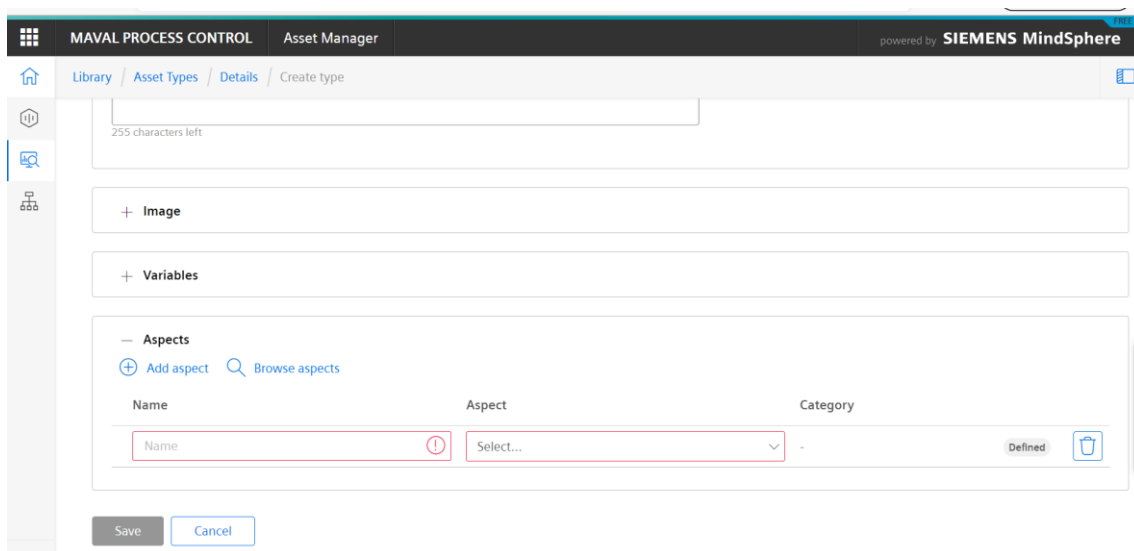
And create Type



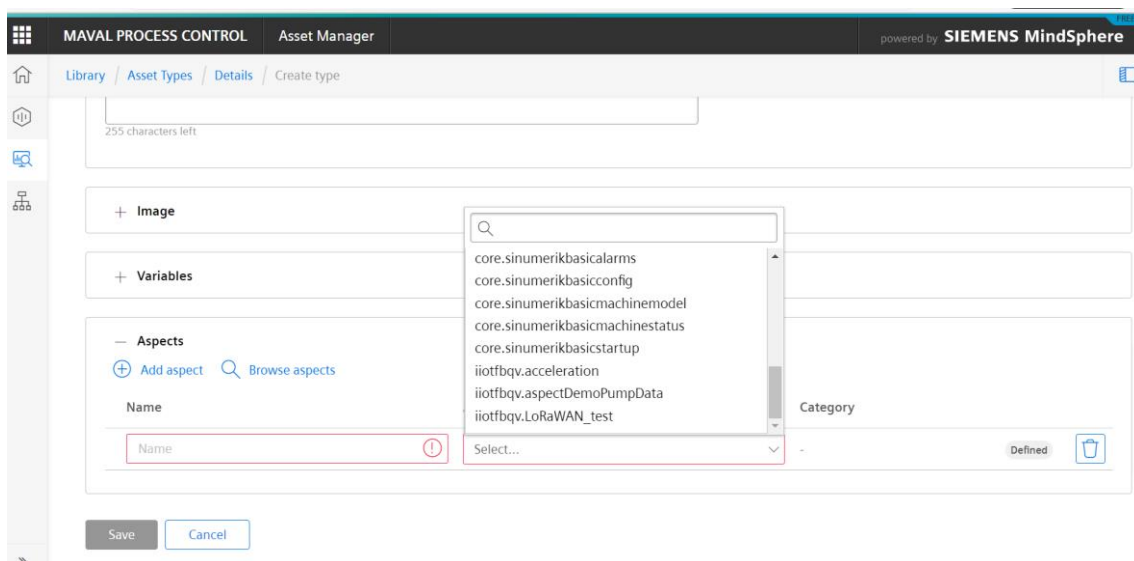
Then you have to scroll down and click on + aspect



And select one of the created Aspects



Give a name and select an Aspect



MAVAL PROCESS CONTROL Asset Manager powered by SIEMENS MindSphere

Library / Asset Types / Details / Create type

255 characters left

+ Image

+ Variables

— Aspects

+ Add aspect Browse aspects

Name	Aspect	Category	
> LoRaWAN_test	iiotfbqv.LoRaWAN_test	Dynamic	Defined

Save Cancel

Once created you will see it on the list

MAVAL PROCESS CONTROL Asset Manager powered by SIEMENS MindSphere

Library / Asset Types / Details

BasicAsset

+ Create type

Filter

- MindConnectIoTExtension core.mindconnectiotionextension
- OPCUADataModel core.opcuadatamodel
- OPCUADatatype core.opcuadatatype
- OPCUAHierarchyDataType core.opcuahierarchydatatype
- Own types
- farmacia** iiotfbqv.farmacia

core.basicasset

BasicAsset

core.basicasset 0 Aspects

Description
Base type for the Asset Management Service.

General Usages

Variables

No variables entered yet

Aspects

No aspects entered yet

If you click on “farmacia” you will see this

MAVAL PROCESS CONTROL Asset Manager powered by SIEMENS MindSphere

Library / Asset Types / Details

BasicAsset

+ Create type

Filter

- MindConnectIoTExtension core.mindconnectiotionextension
- OPCUADataModel core.opcuadatamodel
- OPCUADatatype core.opcuadatatype
- OPCUAHierarchyDataType core.opcuahierarchydatatype
- Own types
- farmacia** iiotfbqv.farmacia

core.basicasset / iiotfbqv.farmacia

Description
File to store data

General Usages

Variables

No variables entered yet

Aspects

Name	Aspect	Category	
> LoRaWAN_test	iiotfbqv.LoRaWAN_test	Dynamic	Defined

Now we have to make two actions:

- 1 Talk to mindsphere (send data to mindsphere but this data will be lost) (we will name it as data_connection)
- 2 Store data to mindsphere (to make this data permanent) (we will name it as data_storage)

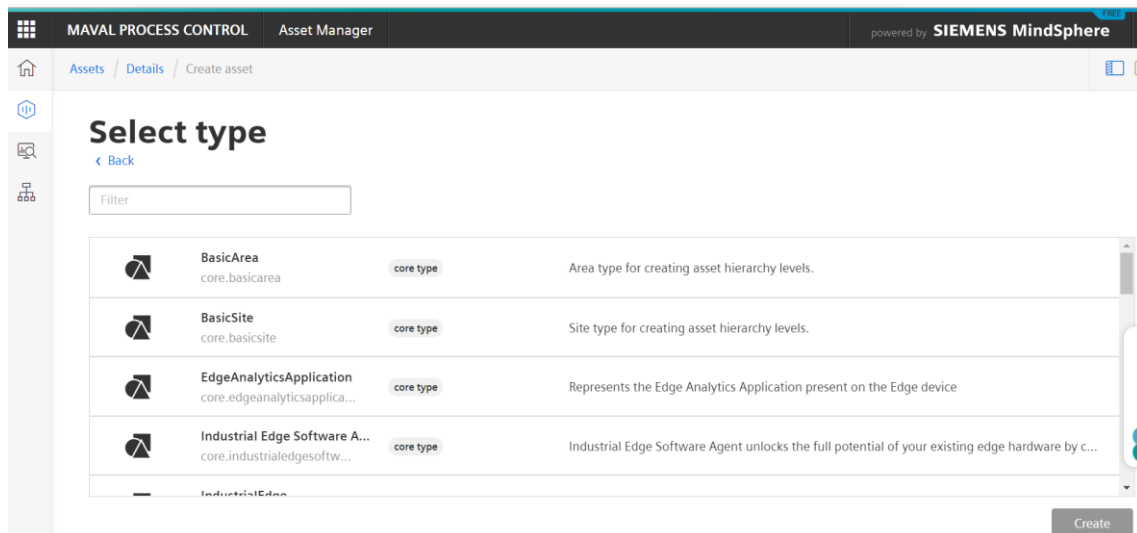
So click on Assets

The screenshot shows the 'Asset Manager' interface. The left sidebar contains a list of asset types: MindConnectIoTExtension, OPCUADatamodel, OPCUADatatype, OPCUAHierarchyDatatype, Own types, and farmacia (iiotfbqv.farmacia). The main panel displays the details for 'core.basicasset / iiotfbqv.farmacia'. It includes a description 'File to store data', tabs for 'General' and 'Usages', and a section for 'Variables' with the text 'No variables entered yet'. Below this is a table of 'Aspects' with columns 'Name', 'Aspect', and 'Category'. The table contains one entry: 'LoRaWAN_test' with aspect 'iiotfbqv.LoRaWAN_test' and category 'Dynamic'. A 'Defined' button is visible next to the entry.

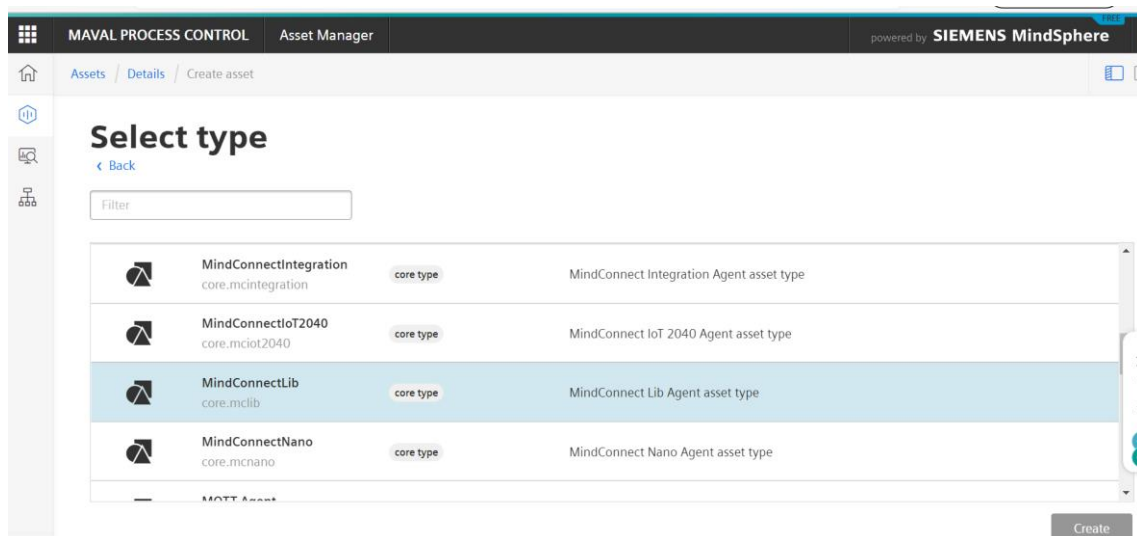
Name	Aspect	Category
LoRaWAN_test	iiotfbqv.LoRaWAN_test	Dynamic

And create Asset

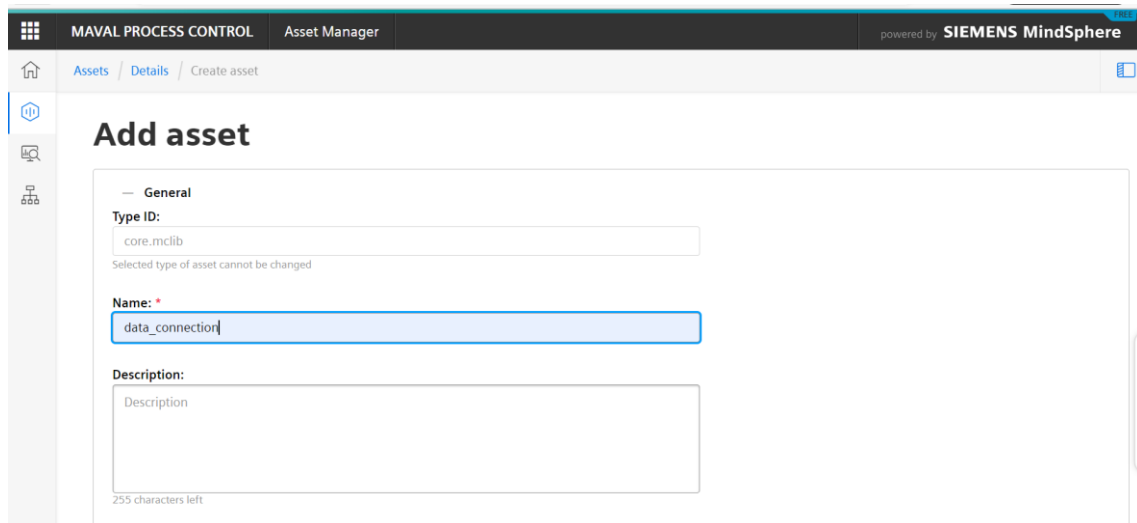
The screenshot shows the 'Asset Manager' interface. The left sidebar contains a list of asset types: data_connection, data_storage, DemoPump, MobilePhone, and RPI Device. The main panel displays the details for 'iiotfbqv'. It includes a description 'Root Asset for iiotfbqv tenant', a location 'No location available', and a section for 'Events' with the text 'No events in the last 24 hours' and a 'Refresh' button. Below this is a section for 'Aspects'.



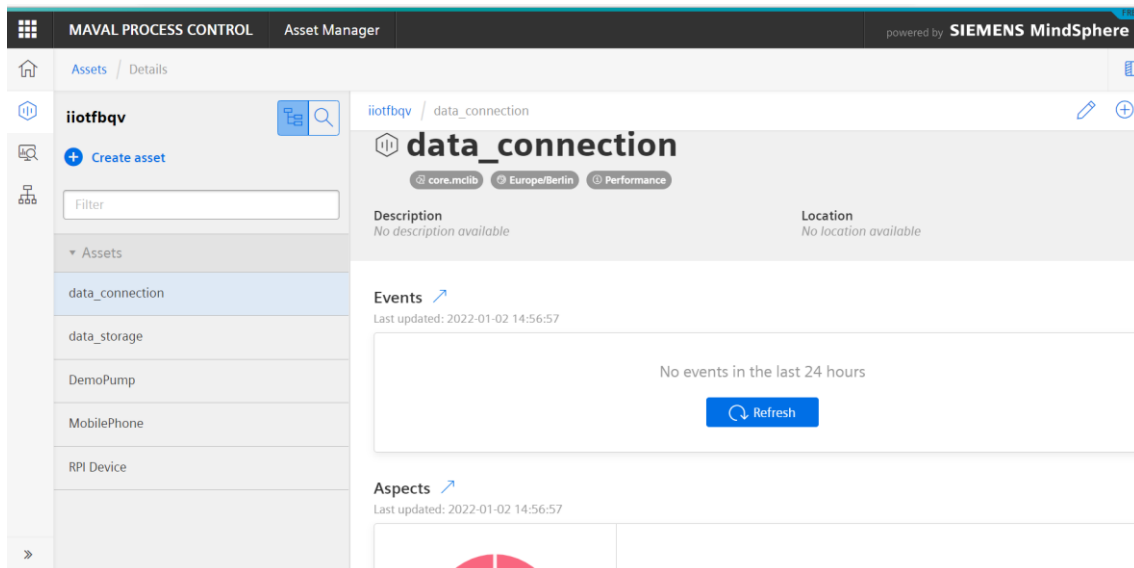
And we select MindconnectLib



And give a name

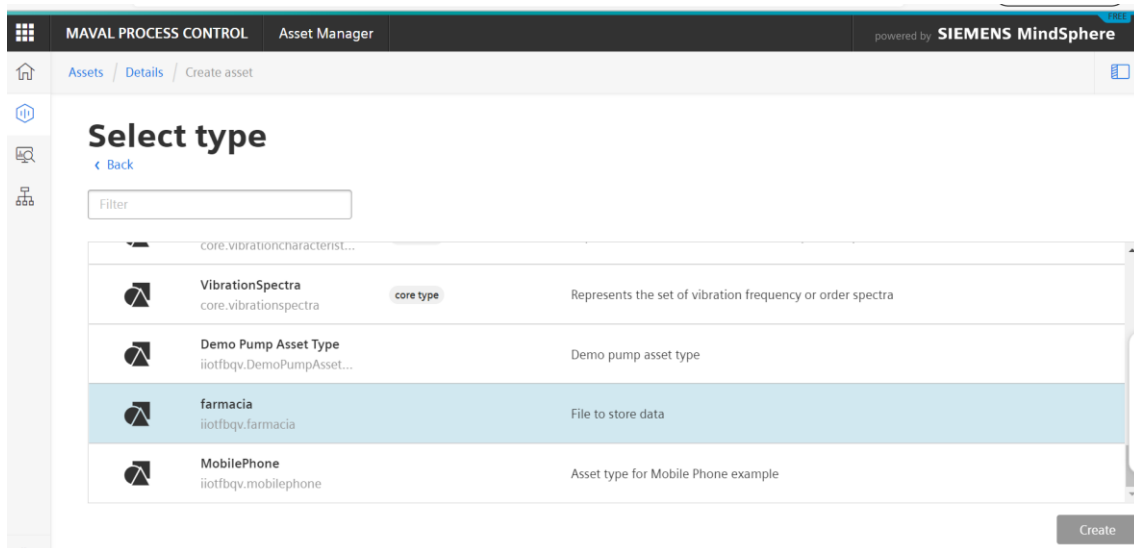


You will see this



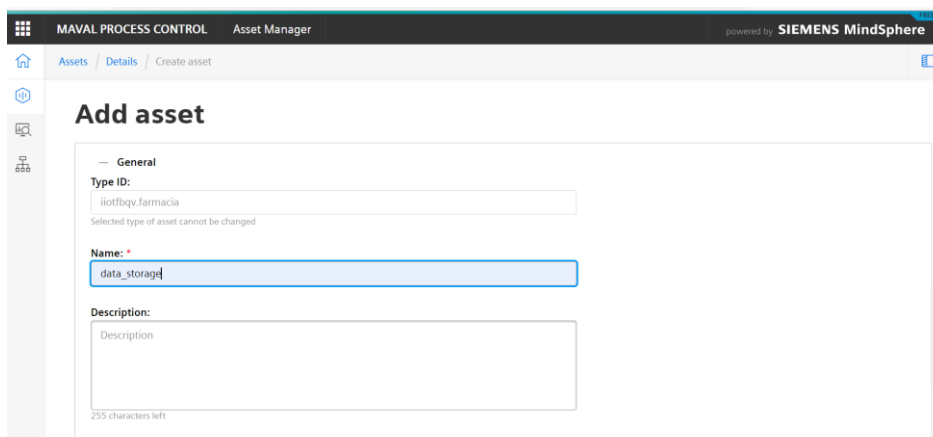
Now we create a storage asset same type than we have created before (farmacia)

We create new asset

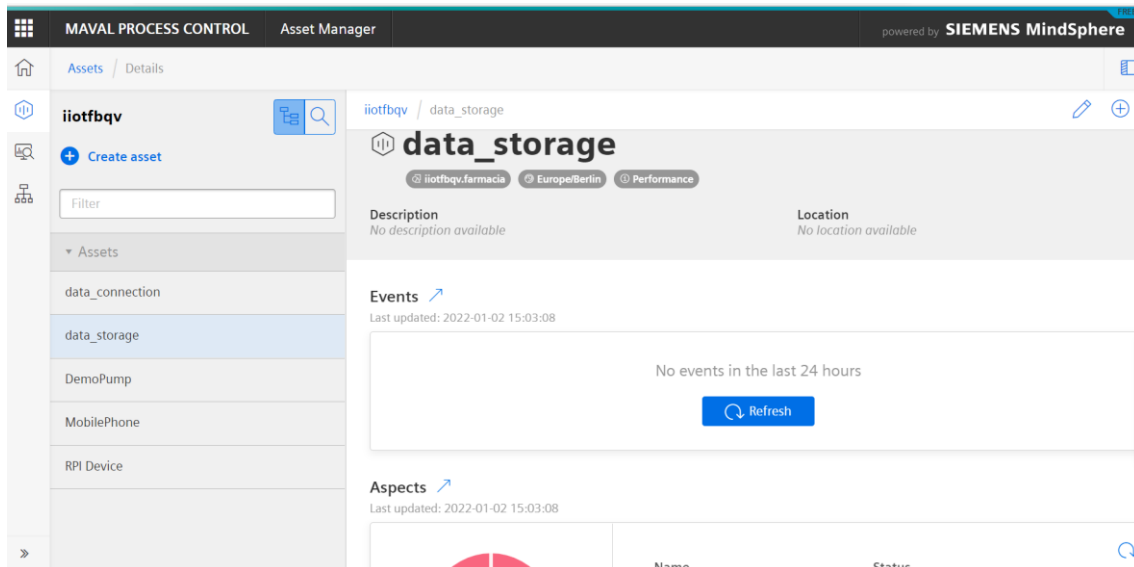


Select previously created asset (farmacia)

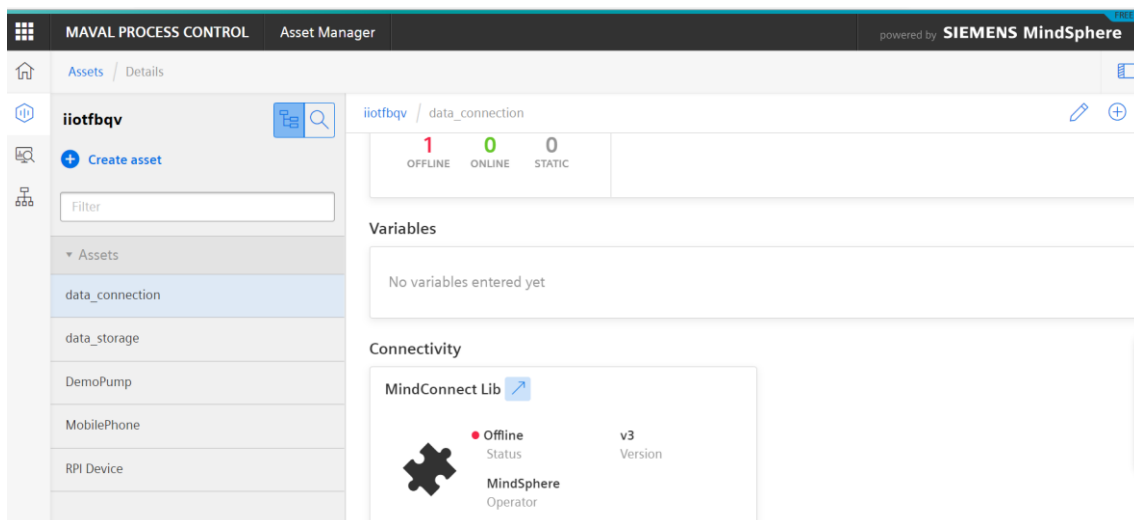
And click on create



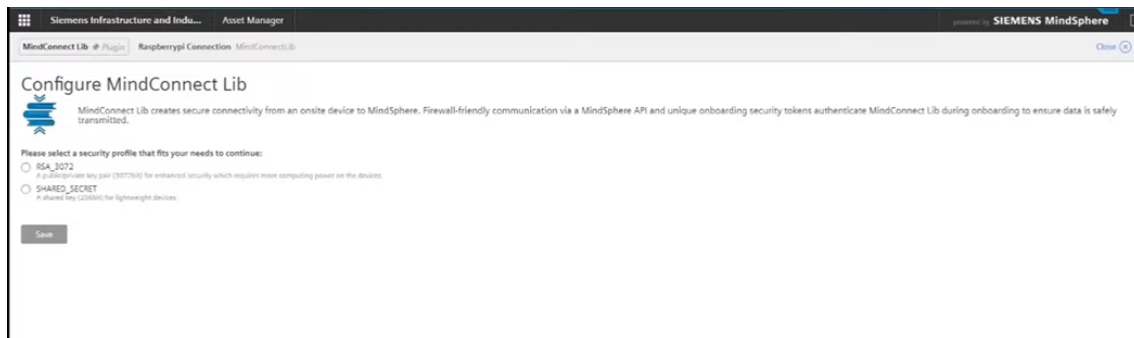
Click on save and you will see this



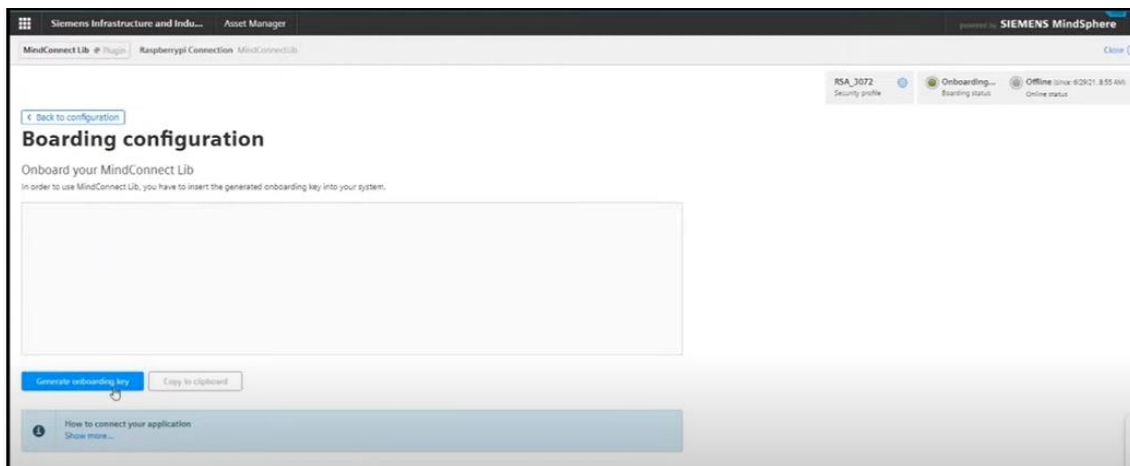
Now we have to go to data_connect asset created and click on the blue arrow close to MindConnect Lib to generate a security Key



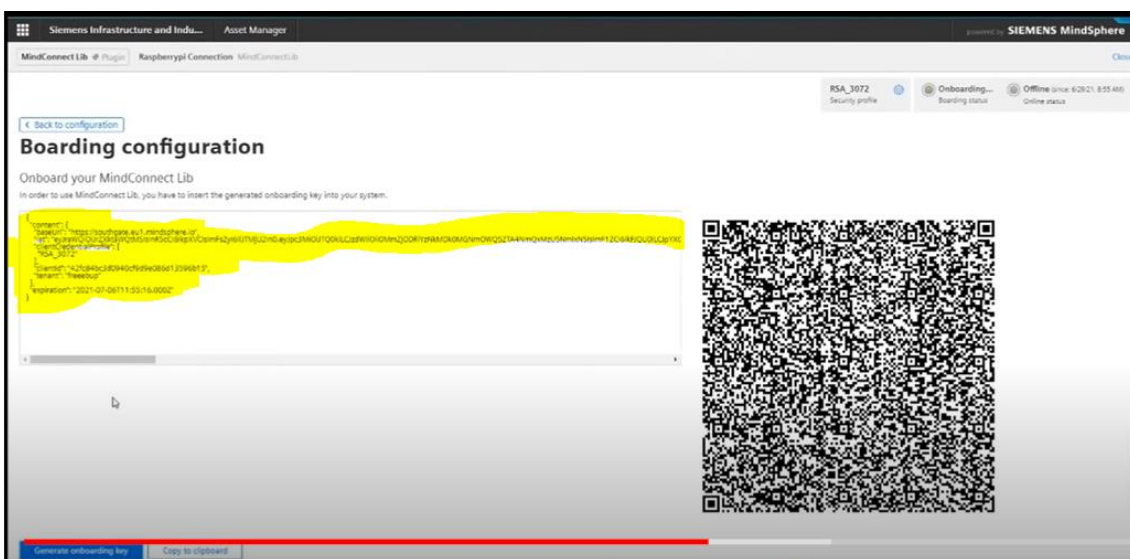
Let's select SHARED SECRET



And click on save

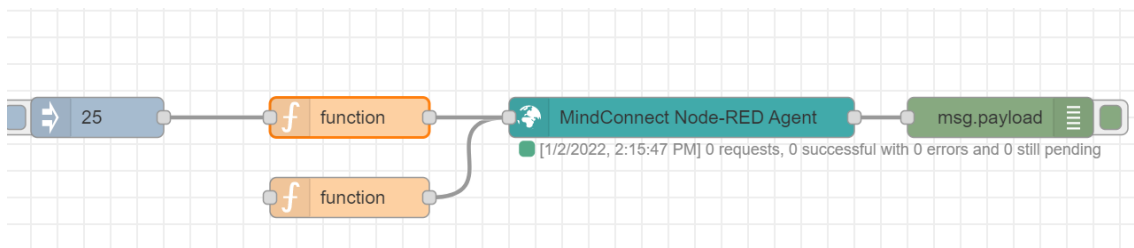


And click on “generate onboarding key”



You will see a key JSON text, copy it and save on a plain text file. You will need it later.

Now we can go to the IBM node RED or any Edge machine we will use



You must use a function like this one, with same name of variable you have created as Datapoint starting with DP-

Edit mindconnect node

Delete

Cancel

Done

⚙️ Properties

⚙️

📄

🖨️

🏷️ Name

🔒 Profile

SHARED_SECRET

▼

🔄 Retries

3

▲▼

⬆️ Async requests

1

▲▼

⬇️ Async duration

10

▲▼

(in seconds)

⚙️ Agent Configuration

📄 Agent Information

🔧

🔄

🗑️

```
{
  "content": {
    "baseUrl": "https://southgate.eu1.mindsphere.io",
    "iat":
```

You will see this

Agent Configuration

⌵

⚙️ Automatic Data Source Configuration (Node Id: b52886e52bc45d23):

The data source configuration will automatically create the data source and data mappings for selected asset. If you want to use a more complex configuration (e.g. if you want to map the agent to multiple assets and/or aspects) please use the [MindSphere Configuration Dialog](#) instead.

📄 The automatic data source configuration will delete all previously configured data sources and mappings.

🔽 Asset List: 🔽 Filter Assets

Showing all assets except core.* assets (like areas, sites, agents etc.)

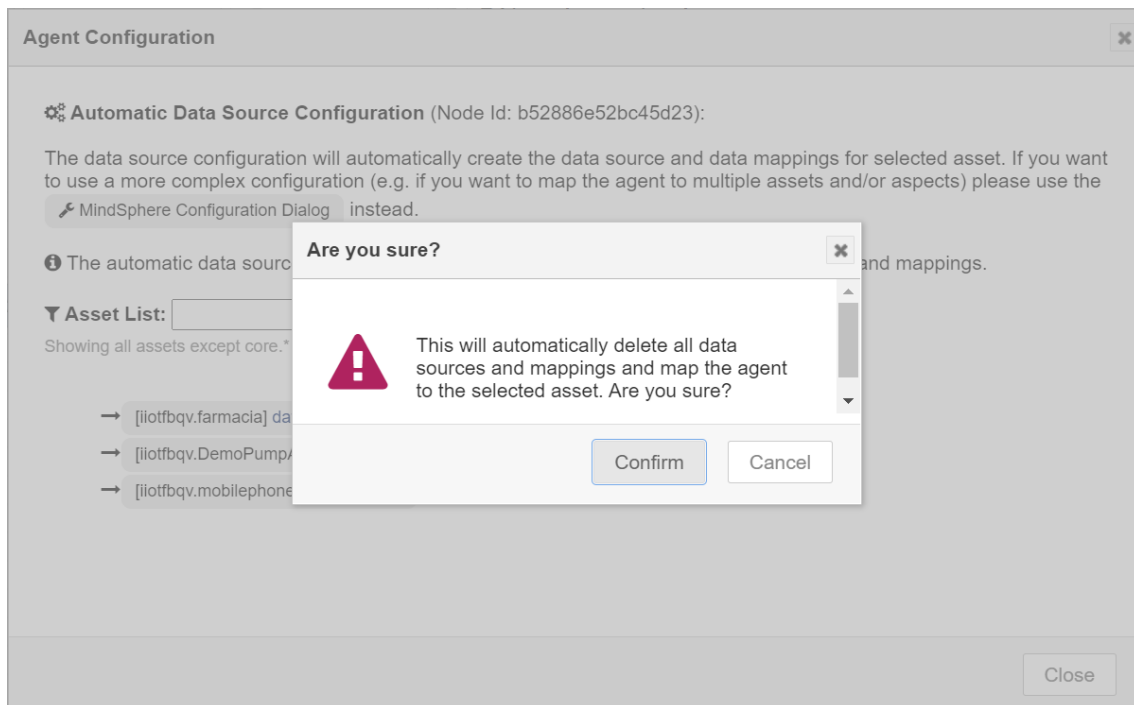
→ [iliotfbqv.farmacia] data_storage

→ [iliotfbqv.DemoPumpAssetType] DemoPump

→ [iliotfbqv.mobilephone] MobilePhone

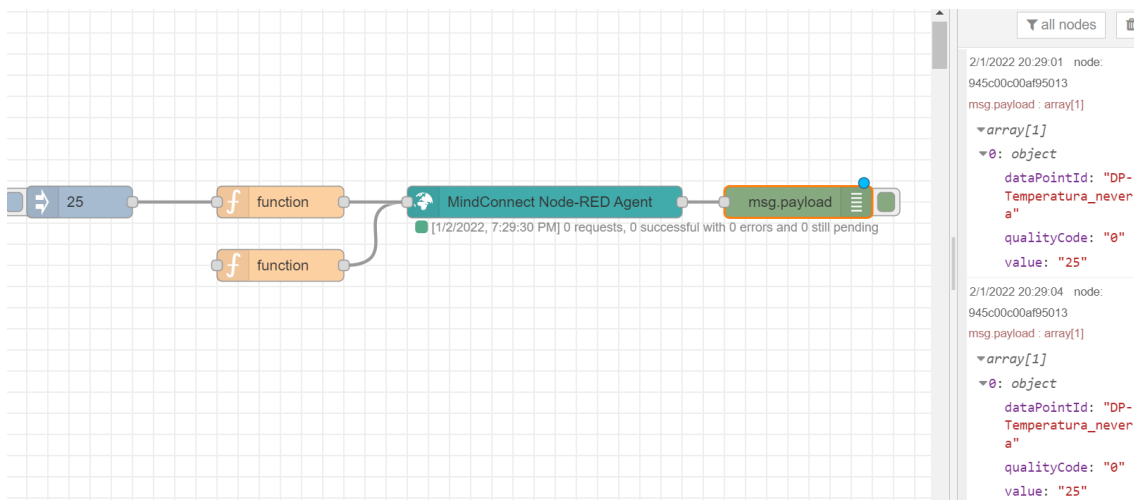
Close

Select our data_storage



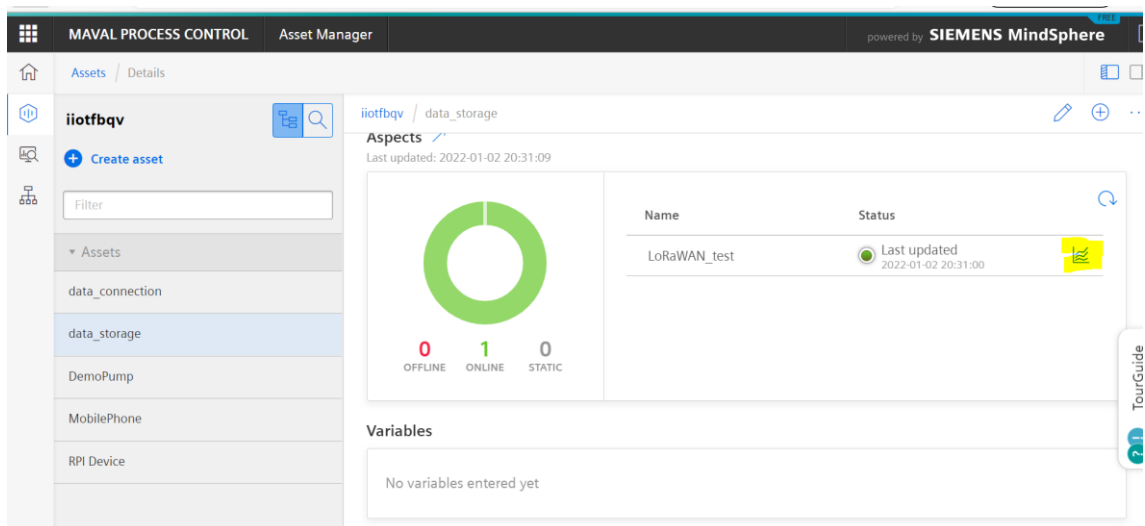
You will see data_connection in green color

We can test the IBM node-RED Flow

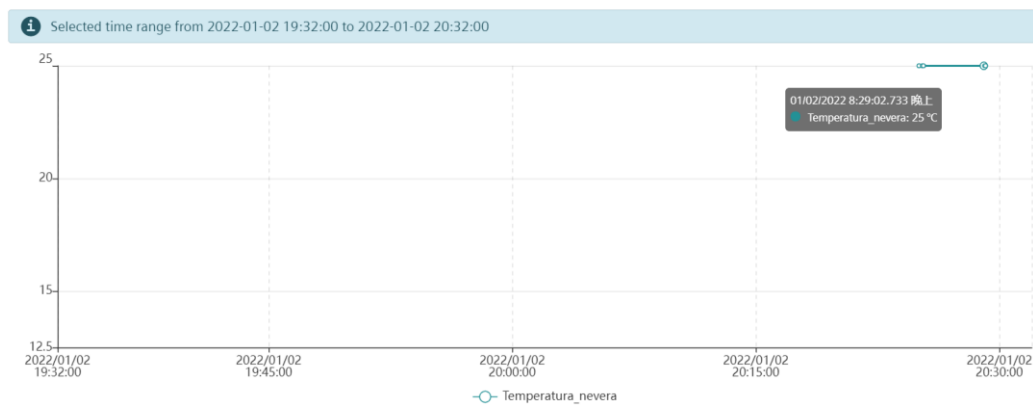


Now we can go to Asset Manager on Mindsphere

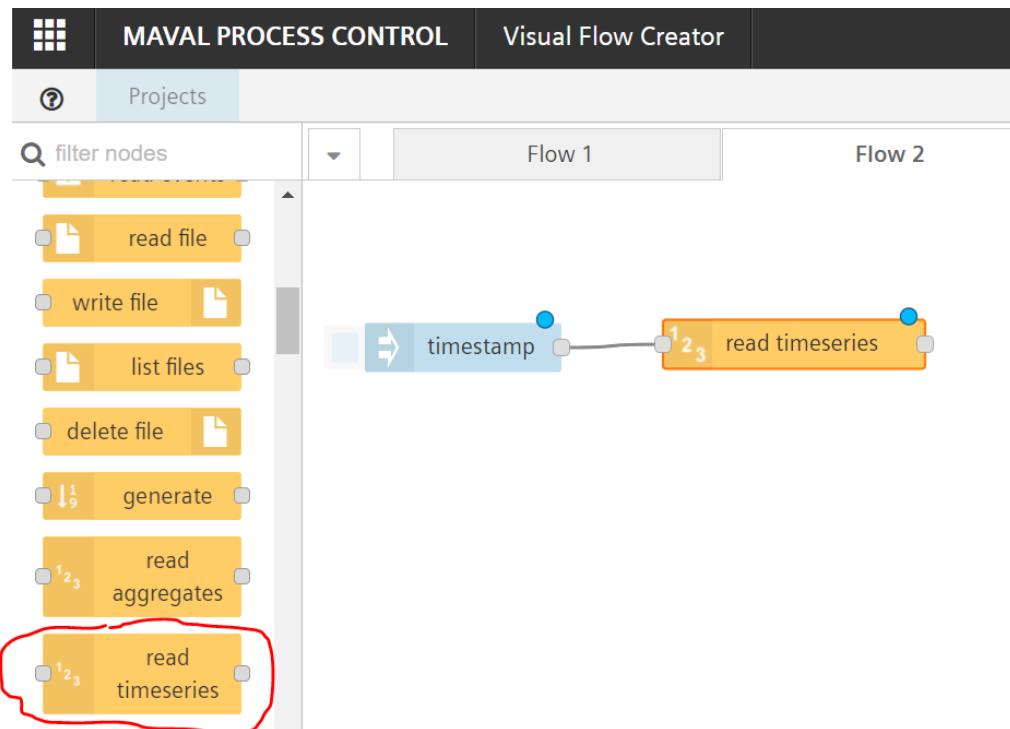
Assets / data_storage and click on the trend graph icon



Time series data for: LoRaWAN_test



Now we can go to the Visual Flow creator from Mindsphere and see wether there is data:



Edit read timeseries node

Delete

Cancel

Done

node properties

Name

Name

Topic

Topic

...

Topic Summary

No asset selected

Mode

Period

Period

1 hour

Offset

no offset

TourGuide

?

!

Assets

Aspects

Variables

Search ...

6 / 6

data_connecti...

core.mclib

-

data_storage

iiotfbqv.farmacia

-

DemoPump

iiotfbqv.DemoPum...

Please do not mo...

iiotfbqv

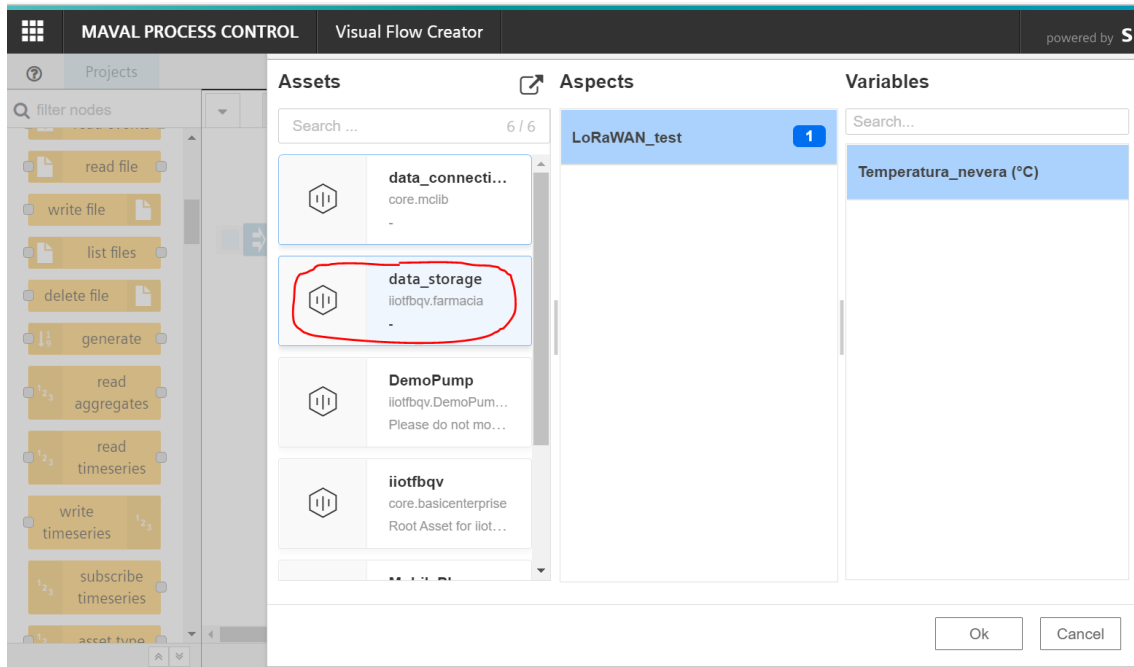
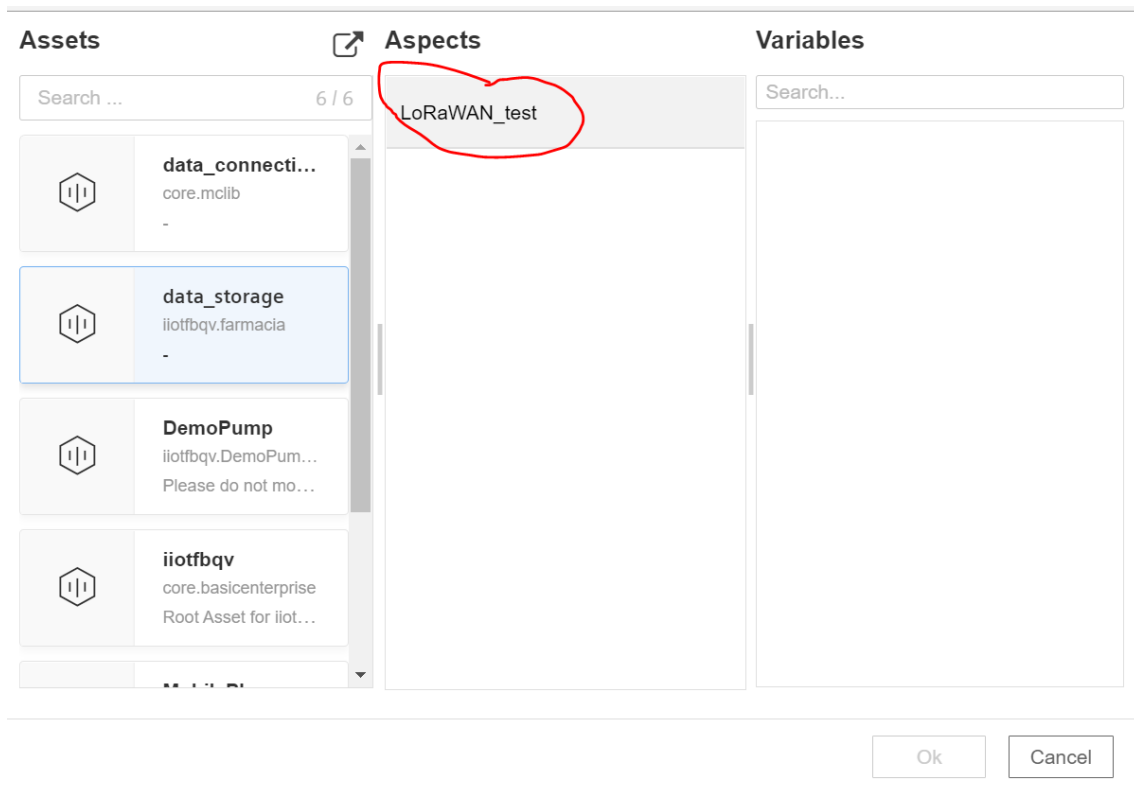
core.basicenterprise

Root Asset for iiot...

Search...

Ok

Cancel



You will get these values

Edit read timeseries node

Delete

node properties

Name:

Topic: ...

Topic Summary:

47f54f6f6afa4f40ad4375ea44ce84e9 (LoRaWAN_test)

Temperatura_nevera

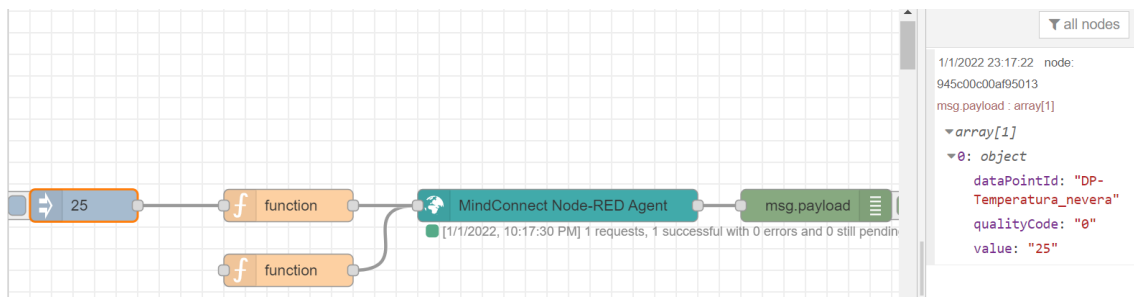
Mode:

Period:

timestamp → ¹2₃ read timeseries data_storage/LoRaWAN_test/Temperatura_nevera → msg.payload

Let's test the flow

First let's inject data from IBM cloud to mindsphere



Attention, you have to insert DP- in front of your data name

Edit function node

Delete Cancel Done

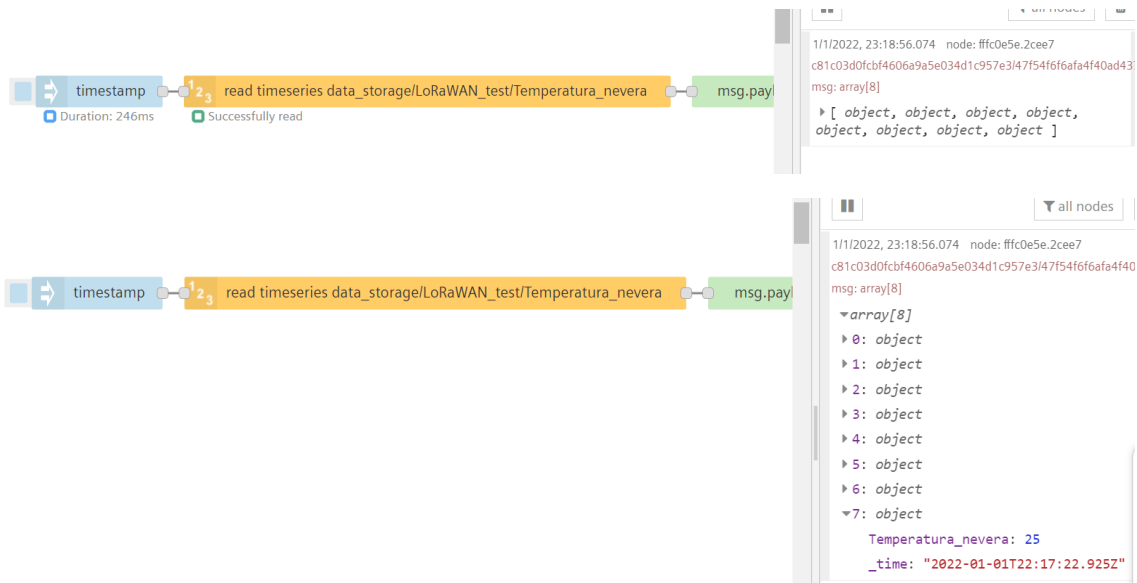
Properties

Name:

Setup On Start On Message On Stop

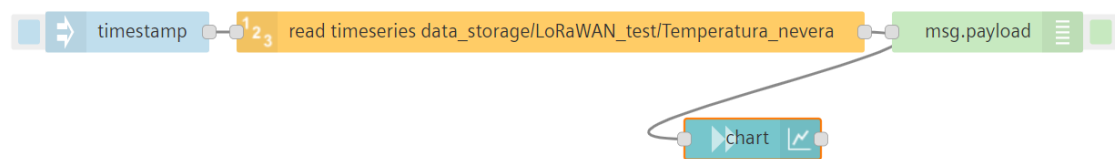
```

1 var newmsg = msg.payload;
2 const values = [{
3   "dataPointId": "DP-Temperatura_nevera",
4   "qualityCode": "0",
5   "value": `${newmsg}`,
6   // "value": "25"
7 },
8 ];
9
10 msg.time = new Date();
11 msg.payload = values;
12 return msg;
  
```



So it works!

Let's add a chart



Edit chart node

Delete Cancel Done

node properties

Group Temperatura_nevera [Temperatura ne ▼]

Size auto

Label chart

Type Line chart ▼ ☐ enlarge points

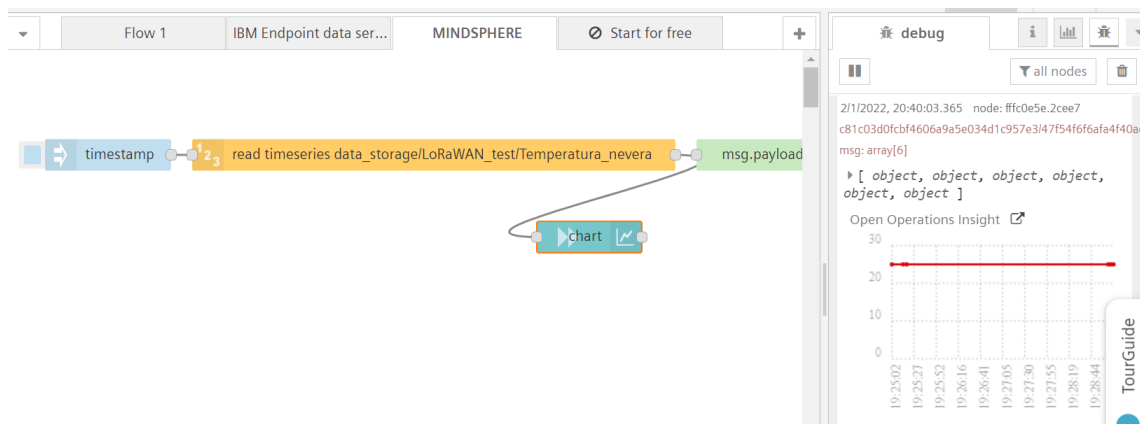
X-axis last 1 hours ▼ OR 1000 points

X-axis Label ▼ HH:mm:ss

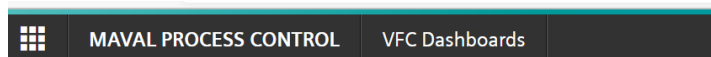
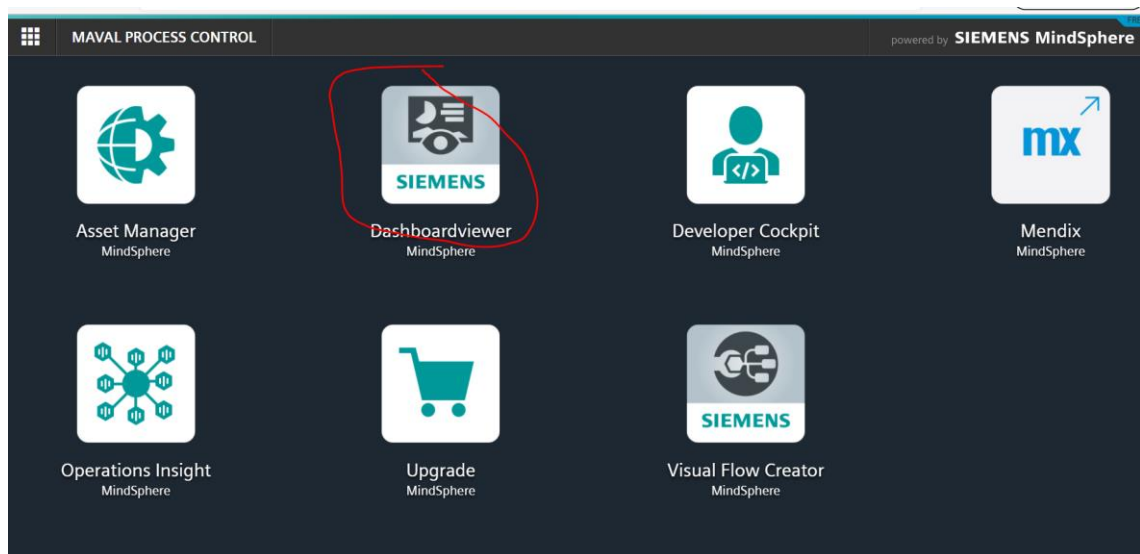
Y-axis min 0 max 1641075307

> port labels

And let's inject again



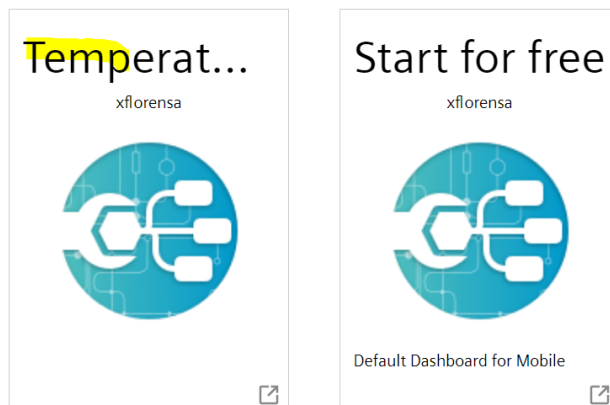
Now let's see the dashboard

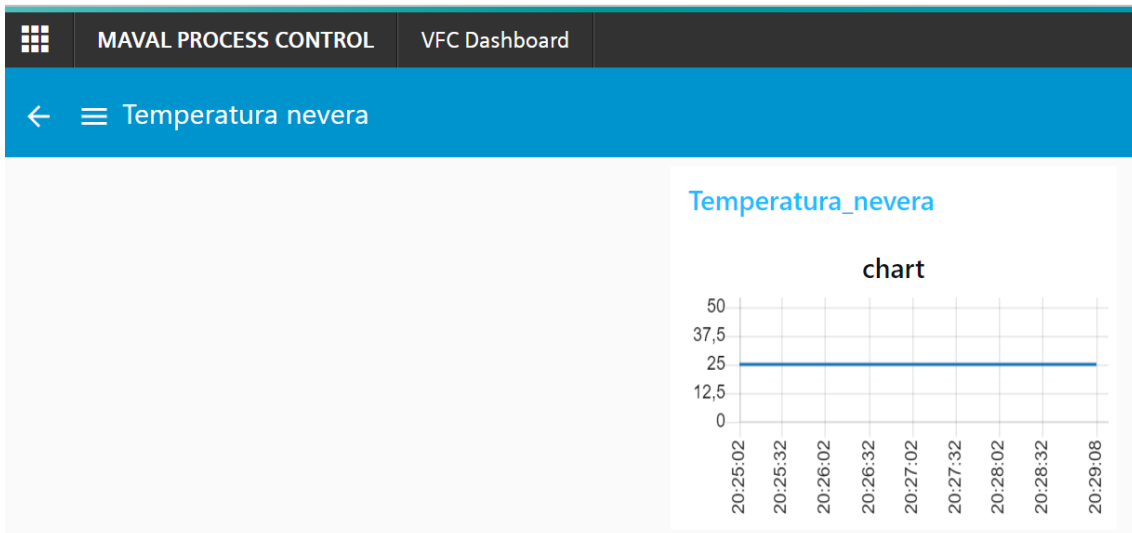


Dashboards Overview

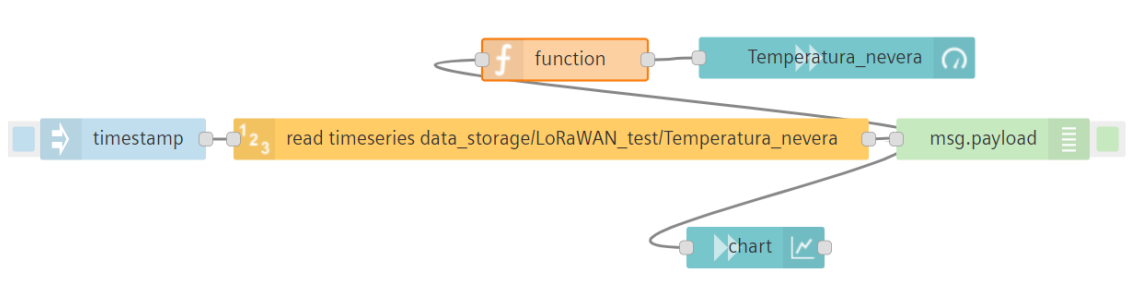
Here you can view all of the Dashboards available to you.

Search for a Dashboard:





We may add a Gauge to see last value



Edit function node

Delete Cancel Done

node properties

Name

Code

```
1 msg.payload=msg.payload[msg.payload.length-1].Temperatura_nevera;  
2 return msg;
```

Outputs 1

See the Info tab for help writing functions.

port labels

Edit gauge node

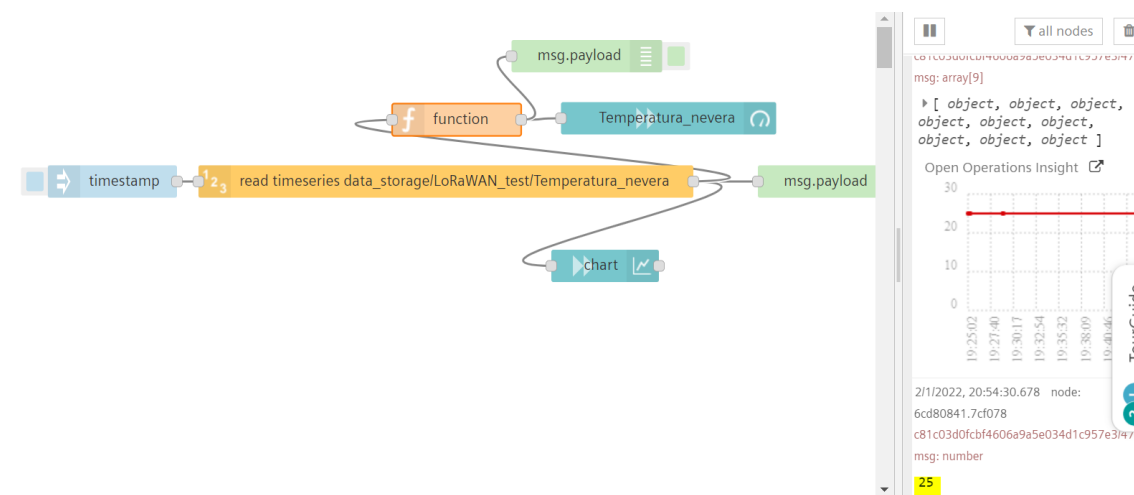
Delete
Cancel
Done

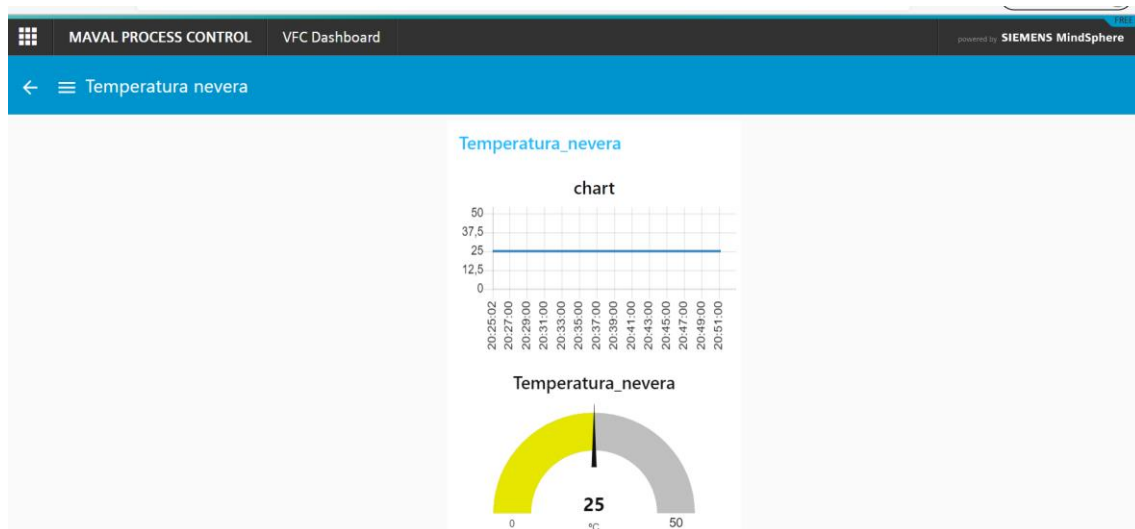
▼ node properties

Group	Temperatura_nevera [Temperatura ne ▼]	
Size	auto	
Type	Gauge ▼	
Label	Temperatura_nevera	
Value format	{{value}}	
Units	°C	
Range	min 0 max 50	

> port labels

Let's inject again on both IBM and Mindsphere Node-RED





Next step is to inject real LoRaWAN data