

Connect an Ewon to MindSphere[®]

APPLICATION NOTE

AUG-0082-00 1.0 en-US ENGLISH

Important User Information

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1 Preface

1.1 About This Document

This document explains how to connect an Ewon Flexy to the Siemens MindSphere® platform using the Ewon MindSphere® connector.

For additional related documentation and file downloads, please visit www.ewon.biz/support.

1.2 Document history

| Version | Date | Description |
|---------|-------------|---------------|
| 1.0 | 20190-10-15 | First release |

1.3 Related Documents

| Document | Author | Document ID |
|----------|--------|-------------|
| eBuddy | HMS | AUG-0063-00 |

1.4 Trademark Information

Ewon® is a registered trademark of HMS Industrial Networks SA. All other trademarks mentioned in this document are the property of their respective holders.

2 Introduction

The Ewon Flexy is the first industrial modular M2M router and data gateway designed for machine builders and system integrators.

The flexibility allows a user to inter-connect remote devices in an environment where communication technologies are constantly changing. It also allows universal communication with the most varied field equipment, regardless of the protocol being used.

In this document, we explain how to configure your Ewon Flexy to collect data from the PLC and send the historical data to MindSphere® platform.

MindSphere® is the cloud-based, open IoT — Internet of Things — operating system from Siemens® which connects your products, plants, systems or machines, and enables you to harness the wealth of data generated by the IoT with advanced analytics.

3 Requirements

3.1 Firmware

To connect to MindSphere®, your Ewon must run at least firmware version 14.0s0.

If you need to update the firmware of your Ewon Flexy, please refer to the eBuddy document from the [Related Documents, p. 3](#).

4 MindSphere® Setup

In MindSphere®, you need to create an **<Asset>** of type **MindConnect Lib** using a **Shared_Secret** profile.

This is required to allow the link between Ewon tags and MindSphere®.

4.1 <Asset> Creation

To create an **<Asset>**, proceed as follows:

1. Open the *Asset Manager* in MindSphere®.
2. Create an new **<Asset>**

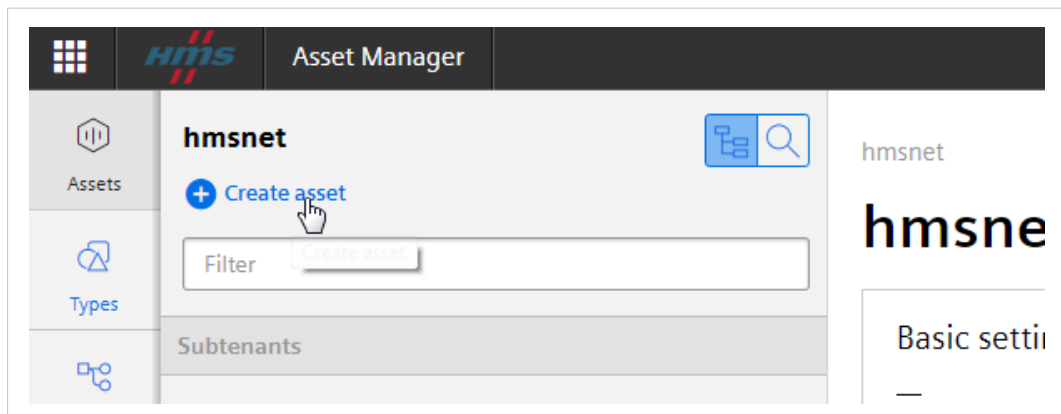


Fig. 1 <Asset> Creation

3. Select the **MindConnect Lib** option.
4. Click on **Create**.

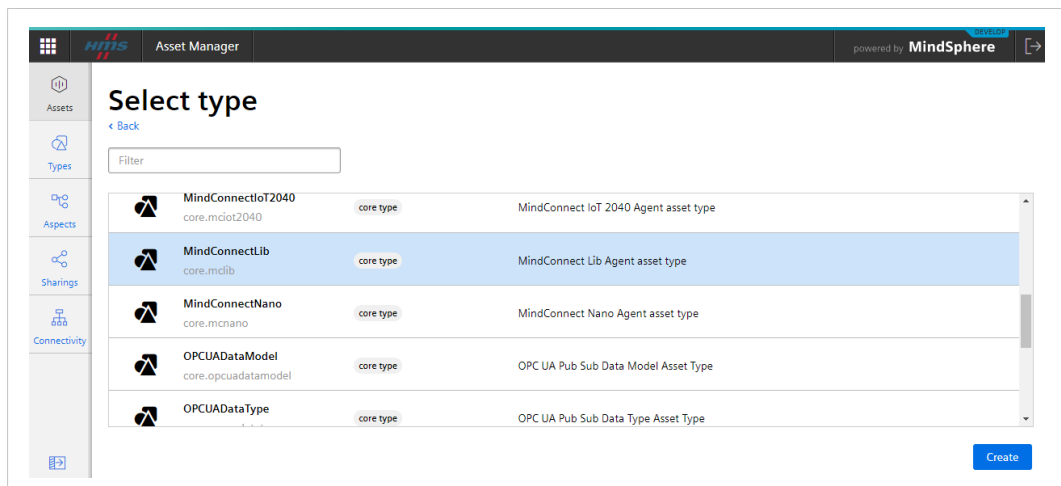


Fig. 2 <Asset> type selection

5. Provide a name to the **<Asset>**.

The **asset name** should reflect the factory or site where the Ewon is retrieving the data from.

6. **Save** the configuration.

4.2 Variables Creation

In MindSphere®, you need to create a variable for each Ewon tag you would like to map.

The MindSphere® variable and the Ewon tag must be of same data type as well as the same unit. Otherwise, data mapping is not possible in MindSphere®

| Corresponding type values | |
|---------------------------|--------------------------------|
| Ewon tag type | MindSphere® data variable type |
| Integer | INT |
| Boolean | BOOLEAN |
| Floating point | DOUBLE |
| DWord | LONG |

4.2.1 <AssetType> Creation

In MindSphere®, you need to create an <AssetType> for your machine to add variables inside your <Asset>.

The <AssetType> can either contain directly the different variables or be based on other aspects.

In our example for this document, we used the following <AssetType> : **PackagingMachine**.

core.basicasset > hmsnet.PackagingMachine

Edit type Add derived type Delete type

PackagingMachine

2 Aspects

hmsnet.PackagingMachine

ID

PackagingMachine

Name

Demo application Ewon TS

Description

Variables

No variables entered yet

Aspects

| Name | Aspect | Category |
|------------------|-----------------------|----------|
| > Conveyor_01 | hmsnet.Conveyor | Dynamic |
| > ProductionData | hmsnet.ProductionData | Dynamic |

Fig. 3 Example of an <AssetType>.

The <AssetType> is composed of 2 different <Aspects> we created inside MindSphere®: **Conveyor** and **ProductionData**.

Under these <Aspects>, we declared the different variables which will be linked to Ewon tags.

| Aspects | | | | |
|----------------|-----------------------|--------------|-------------|---------------------------|
| Name ↕ | Aspect | | Category | |
| Conveyor_01 | hmsnet.Conveyor | | Dynamic | Defined ↗ |
| Name ↕ | Data type | Unit | Max. length | Latest value |
| DownTime | INT | s | - | - |
| ProductionRate | LONG | boxes/min | - | - |
| Speed | DOUBLE | rotation/sec | - | - |
| Status | BOOLEAN | on/off | - | - |
| Temperature | DOUBLE | °C | - | - |
| UpTime | INT | s | - | - |
| ProductionData | hmsnet.ProductionData | | Dynamic | Defined ↗ |
| Name ↕ | Data type | Unit | Max. length | Latest value |
| Boxes | LONG | boxes | - | - |
| OEE | DOUBLE | % | - | - |

Fig. 4 Variables examples

4.2.2 <AssetType> and <Asset> Combination

Once the <AssetType> for your machine has been created, you can link it to the **MindConnect Lib** asset:

1. Select the **MindConnect Lib** asset you just created inside the *Asset Manager* section.
2. Click on the **Add child asset** icon.

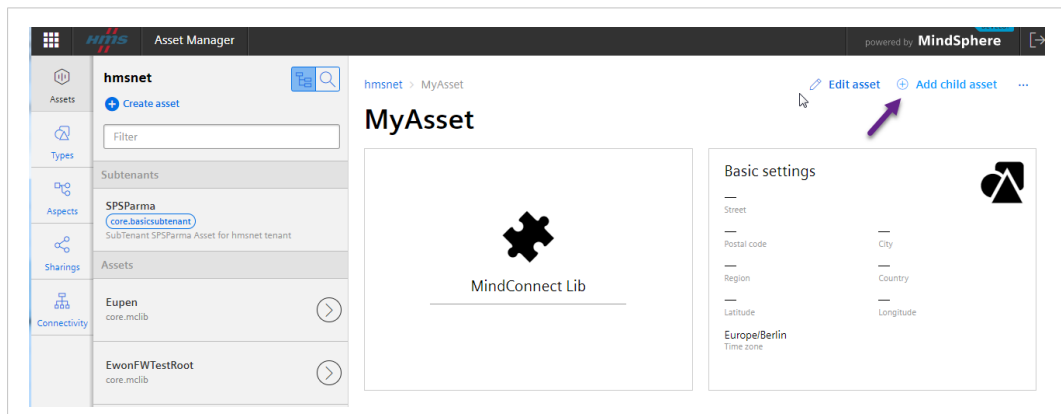


Fig. 5 Add a child asset

3. Select the <AssetType> containing the variables you created earlier when asked to choose the *Asset type*.

4.3 Tenant and IAT for Onboarding

To allow your Ewon to send data to your MindSphere® account, you need need to “onboard” the Ewon first:

1. Select the **Asset** you created for your Ewon in the *Asset Manager*.

- Click on **MindConnect Lib**.

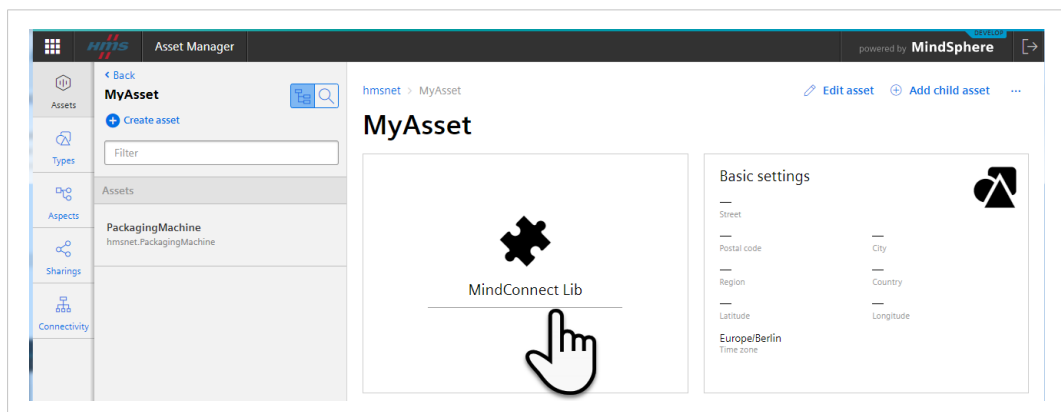


Fig. 6 Selection of Asset

- Select the **Shared_Secret** option when asked to choose the *security profile*.

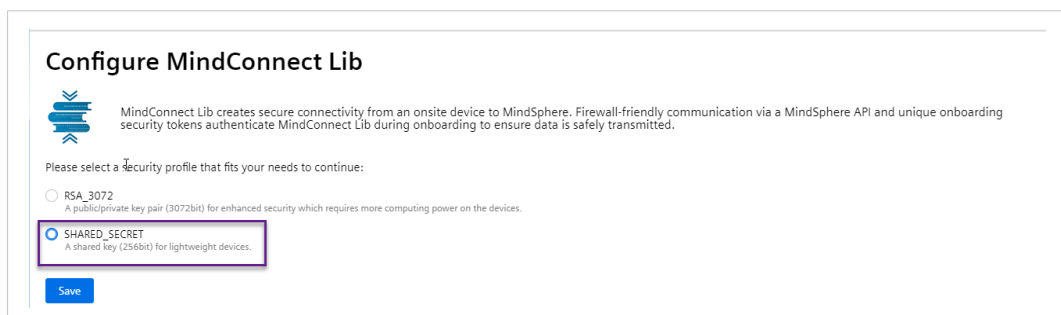


Fig. 7 Selection of the security profile

- Click on **Save**.
- Click on the **Generate onboarding key** button.

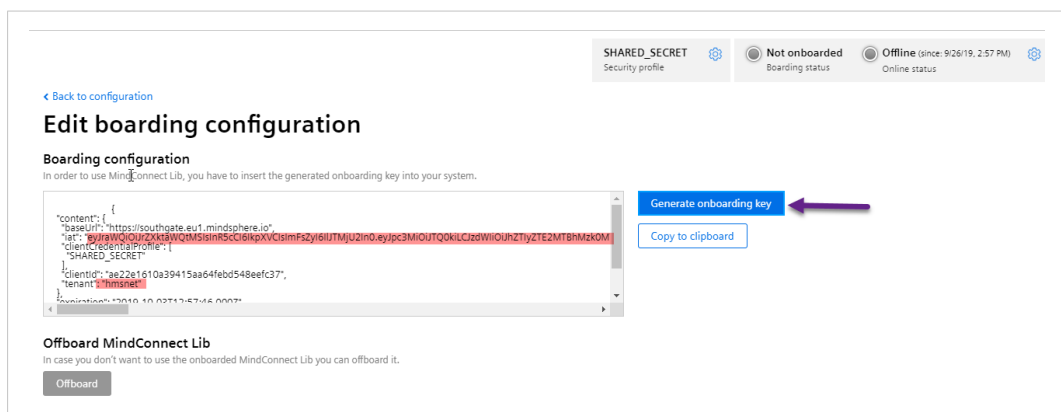


Fig. 8 Generation of the onboarding key

6. Copy the **IAT — Initial Access Token** — and the **tenant** of the onboarding key.

You will need these elements later in the Ewon configuration.

In case, you need to review the onboarding configuration, you can always display the configuration frame by clicking on the configuration icon, in the top right corner.



Fig. 9 Link to the onboarding configuration panel

5 Ewon Setup

5.1 Ewon IP Address

For the Ewon LAN interface, you must set an IP address compatible with the IP address of the Siemens® PLC you want to connect to.

To change the IP address of your Ewon, please refer to the eBuddy document from the [Related Documents, p. 3](#).

5.2 Quick Launch Wizard

To successfully connect to MindSphere® platform, you all need to set up the system and Internet connection of your Ewon:

1. Open your Internet browser.
2. Connect to the web interface of your Ewon by browsing to its LAN IP address.
The default username and password are **adm**.
3. Launch the **Quick Launch Wizard**.

You can also launch each wizard separately by clicking on the **<Wizards>** button in the top right corner.

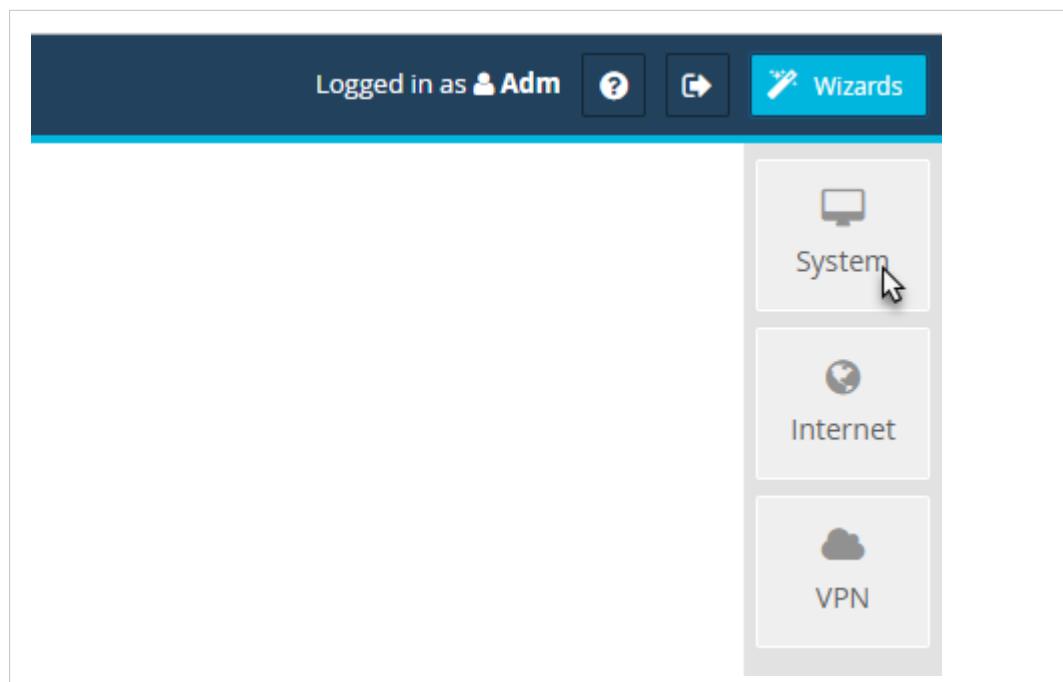


Fig. 10 Ewon wizards

5.2.1 System Wizard

To configure the system of your Ewon, proceed as follows:

1. Define the **<name>** of your Ewon.
For example: this name could be the place or factory where the Ewon is located.
2. Change the **<username>** and **<password>**. This is a mandatory modification.

3. Configure the **<date and time>**.

We recommend to select **update clock via NTP** as it is important to maintain an accurate date and time for synchronization purpose with MindSphere®.

4. Keep the standard LAN/WAN ports attribution.

5.2.2 Internet Connection Wizard

The wizard following the system wizard helps you configure the Internet connection of your Ewon.

It is important that you first plug an Ethernet cable — granting an Internet access — into the WAN port of your Ewon. On the Ewon Flexy 205, the WAN port is indicated by the orange LED near the port.



Fig. 11 Plug the WAN Ethernet cable

To configure the Internet connection of your Ewon, proceed as follows:

1. Select the **WAN interface** that will be used by your Ewon to get access to Internet.
2. Provide the **settings** of the selected WAN interface.

A standard configuration would be using the **Ethernet Internet connection** and the **DHCP** IP attribution.

Alternatively, you can also use a **Wi-Fi** or a **cellular** connection.

5.2.3 Talk2M (VPN) Wizard

This wizard allows the configuration of the remote access to the Ewon and the devices plugged in the Ewon.

If you do not need the remote access to your devices, you can skip this wizard.

The Talk2M connection is not required for the MindSphere® platform. The Talk2M connection can also be configured later on.

However, if you do not launch the Talk2M wizard, then please refer to the [Firewall Settings, p. 25](#) section.

To link your Ewon to your Talk2M account, proceed as follows:

1. Select which registration method you want to use:

– **Register with Ewon Name**

An Ewon Flexy can be automatically registered on a Talk2M account without prior configuration by using this option.

However, it is recommended to create the Ewon entry in eCatcher before selecting this method of registration.

To use this method, the **<username>** indicated in the below option field must have administrator rights in eCatcher!

As you chose to go further with this option, 4 fields appear:

- **<Talk2M Account Name>**
- **<Ewon Name>**
- **<Talk2M Username>**
- **<Talk2M User Password>**

Register with Ewon Name



If the Talk2M account is a Pro account and if the Ewon hasn't been created in eCatcher prior to the registration, make sure the auto-registration feature has been enabled in eCatcher otherwise the device will not be registered.

Register with Activation Key

The second method to register anEwon is with the activation key.

This key can be found in **Properties ▶ Talk2M Connectivity** of the Ewon created in eCatcher. It is represented under the form: **d3b3caad74bd7c9d1c7e6f5900z0zzzz**.

Once the option has been clicked in the wizard procedure, a single field appears:

- **Activation Key**



*The **<Global Registration Key>** can be used during the registration instead of the activation key. The GRK can be found in Account ▶ Show advanced settings ▶ Ewon auto-registration of the Talk2M account in eCatcher. It appears under the form: **Z00-D08E2B9981396AA380A0631ZZ0Z0000**.*

Proxy Configuration

As the registration process is over, the next page will ask if the Internet connection is established through an HTTP proxy server. Check the box if it is the case.

It is also the occasion to display the *Advanced parameters* section. During the VPN connection test (that is performed on the next page), an error might occur if the UDP port isn't accessible. In this case, the advanced parameter allows to force the connection to be established in TCP.

Testing the VPN Connection

The last page of the Talk2M wizard is the VPN connection test based on the given configuration. If the test is successful, the device should be online in eCatcher.

5.3 Collect Data from the Field Equipment

Once you have configured the different wizards, you can create the tags for the data you want to poll from the PLC and send to MindSphere®.

With its embedded IO servers, the Ewon allows to poll data from the most common PLC brands. In our demonstration, we will show how to create a Modbus tag. If you need help to poll data from other PLC brands, please refer to our website: www.ewon.biz/support.



The data exchange between your Ewon and MindSphere® is based on historical data. You need to enable the historical logging for the tags you want to transfer to MindSphere® inside your Ewon.

To create a Modbus tag, proceed as follows:

1. Go to the **Tags ► Values** section from the left-side menu of the Ewon web interface.
2. Activate the **<Setup>** mode.
3. Click on **Add**.

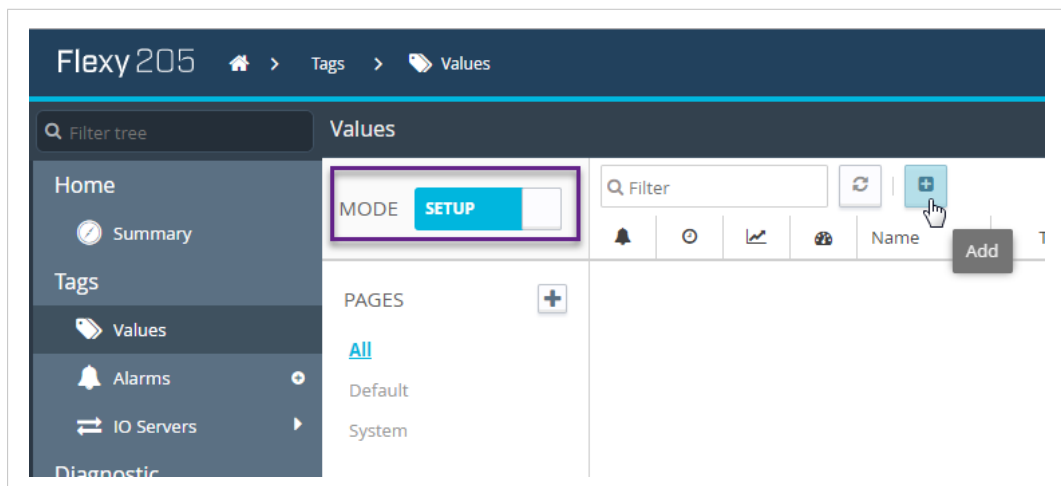


Fig. 12 Add a tag

4. Specify the different tag settings:
 - a name,
 - the IO server: Modbus,
 - a topic (e.g.: A),
 - a Modbus address,
 - a tag type,
 - the unit,
 - the historical logging enabled.

Create a new Tag

Identification

Tag Name: Value1 Page: Default

Tag Description:

I/O Server Setup

Server Name: MODBUS Topic Name: A

Address: 40001
Enter ValueName. The ValueName is a Status tag or a PLC tag. For a PLC tag, the Register address range may be optionally prefixed with an indication that second standard is followed (+), and postfixed by a value modifier

Type: Integer ☐ Force Read Only

Unit: Pa

Ewon value = IO Server Value * 1 + 0

Alarm Setup ☐ Alarm Enabled

Historical Logging ☒ Historical Logging Enabled

Logging Deadband: 5 (put a negative value to disable deadband logging)

Logging Interval: 60 Seconds (set to 0, it will enable Deadband logging only)

Add Tag

Fig. 13 Modbus tag configuration

To avoid massive data sent to MindSphere®, it is important to set accurate values for the **<Logging deadband>** and the **<Logging Interval>**. For example: configured as showed in the

above picture, the value is stored every 60 seconds but also every time the value changes more than 5 units.



Specify the correct **<Type>** and **<Unit>** for each Ewon tag. Those settings need to match the **<Data Type>** and **<Unit>** settings of the variables created inside MindSphere®. Refer to [Corresponding type values, p. 7](#)

6 Connect your Ewon to MindSphere®

To send data to MindSphere®, we need to onboard the Ewon to MindSphere®.

The onboarding process consists in connecting your Ewon to an *Asset* that you have created in MindSphere® beforehand. During the Ewon configuration, you need to specify the **<Tenant>** and the **<IAT (Initial Access Token)>** linked to this *Asset*.

Make sure you have this information ready as explained in [Tenant and IAT for Onboarding, p. 8](#).

6.1 Ewon Data Management

To export the data from Ewon to MindSphere® we will use the *Data Management* feature of the Ewon Flexy.



For the configuration step, make sure your Ewon the Internet connection configured and active (e.g.: the Ethernet WAN cable is plugged in).

1. Go to **Setup ► System ► Main ► Net Services ► Data Management** in your Ewon web interface.
2. Select **MindSphere®** from the **<Data Management>** dropdown list.

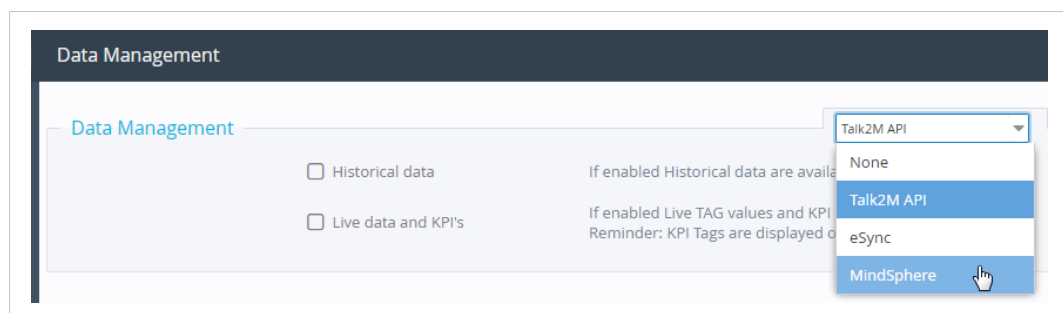


Fig. 14 MindSphere® as data management

3. Set the following fields:

- the **<Tenant>** (copied from MindSphere®),
- the **<IAT>** of the Asset (copied from MindSphere®).
- the **<Upload Interval>**.

For example: if you put 5 minutes, the Ewon synchronizes each 5 minutes its data with MindSphere®.

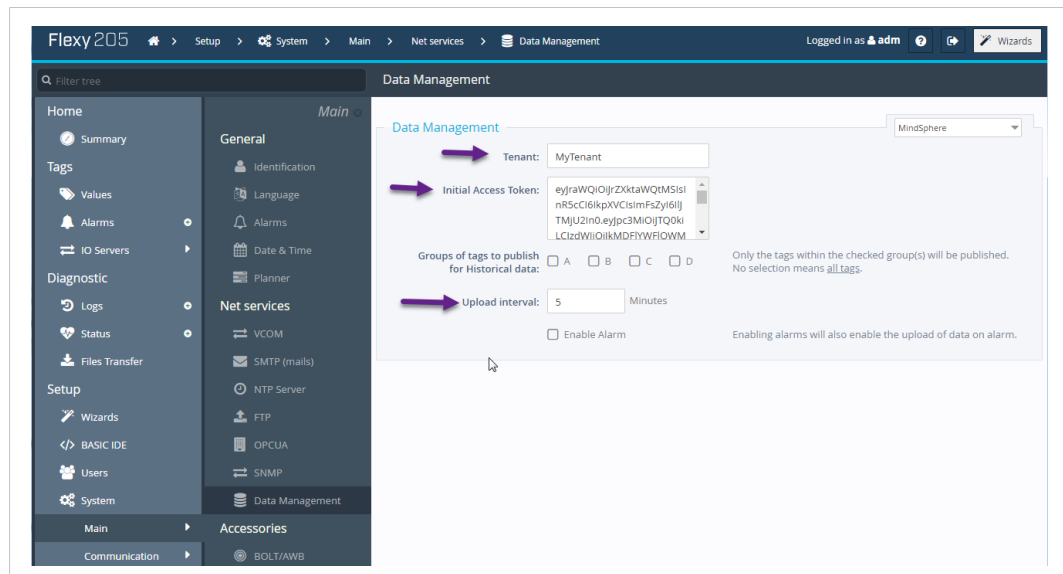


Fig. 15

4. Click on **Update**.

→ Your Ewon now starts the onboarding process. Once the onboarding process done, the *Data Management* window changes.

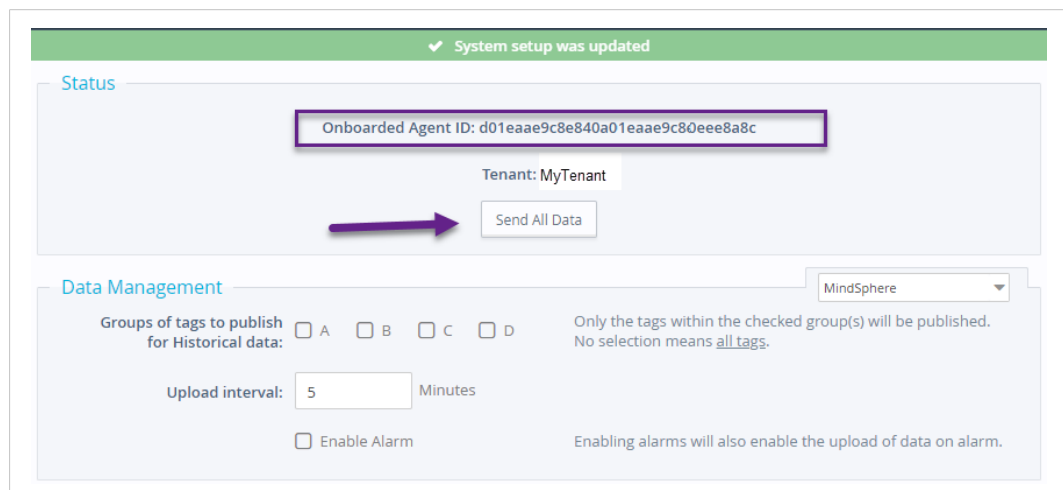


Fig. 16 Send tags to MindSphere®

5. [Optional] You can also click on **Send All Data** to force a synchronization.
6. The configuration of your Ewon is now terminated.

To verify that your Ewon Flexy is correctly sending its data to MindSphere®, proceed as follows:

1. Open the *Asset Manager*.
2. Select your **<Asset>**.

- Click on the **<MindConnect Lib>** button.

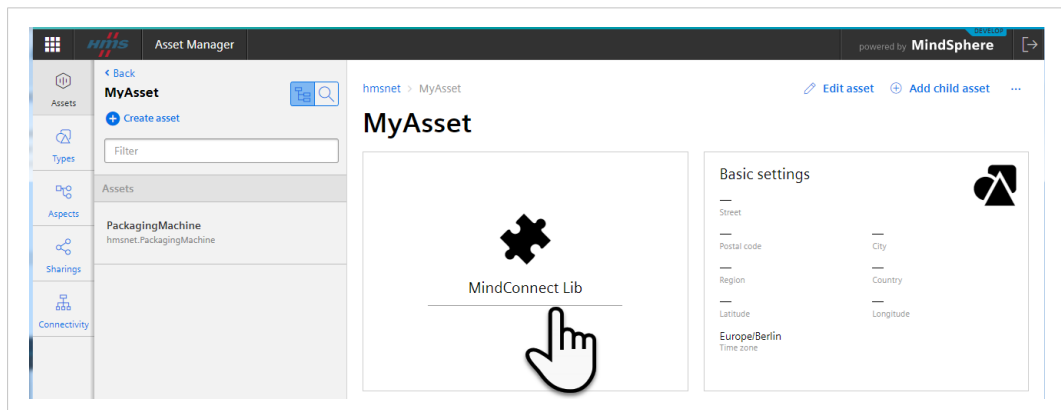


Fig. 17 Selection of Asset

The onboard box should be green. The online box is green when the Ewon has sent its data recently.

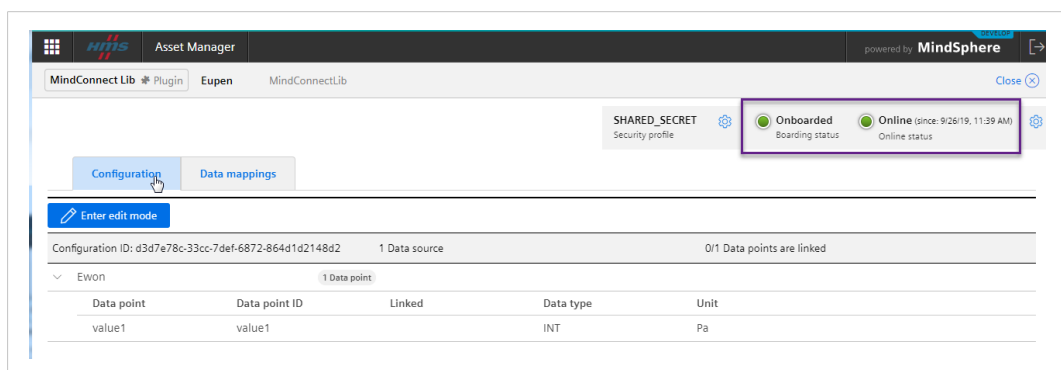


Fig. 18 Online status

6.2 Data Mapping inside MindSphere®

To use the data send by your Ewon to MindSphere®, you need to link the Ewon tags to the MindSphere® variables. To do so, proceed as follows:

- Open the *Asset Manager* in MindSphere®.
- Select your **<Asset>**.
- Click on the **<MindConnect Lib>** button.

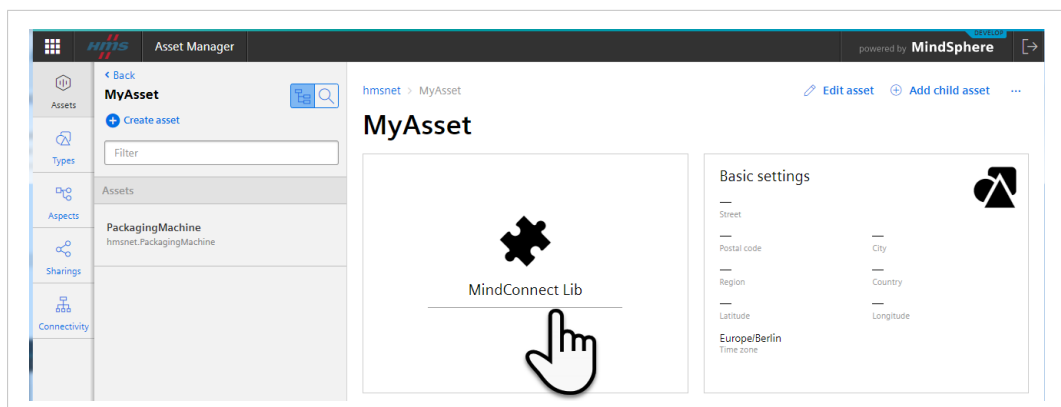


Fig. 19 Selection of Asset

- Display the **<Data mappings>** tab.

5. Select the **Ewon tag**.
6. Click on the **Link variable** icon.
A popup displays all compatible — and only those — MindSphere® variables for this tag.
Compatibility between Ewon tags and MindSphere® tags are based on data type and units.

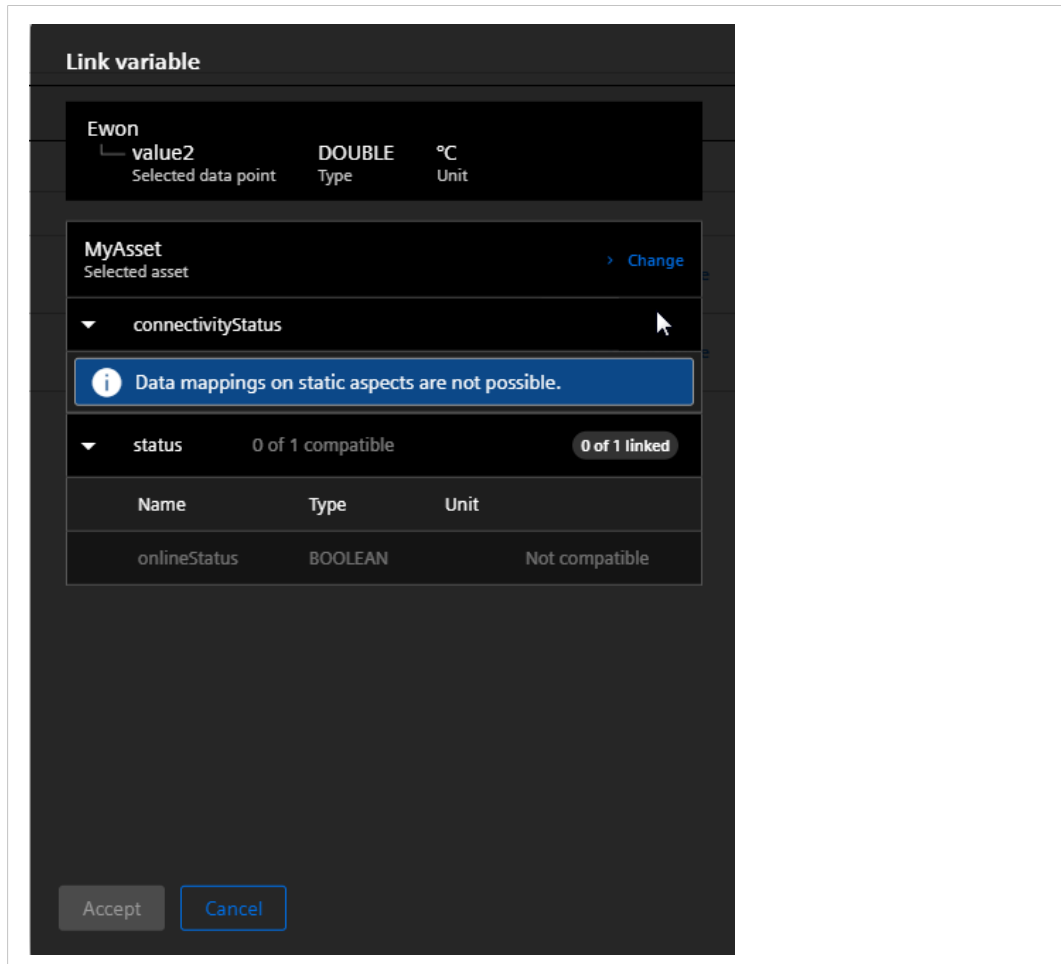


Fig. 20 Link variables to tags

Depending on how you structured your asset, you'll probably need to first select the corresponding child asset to find compatible variables.

To do so, proceed as follows:

1. Click on the **Change** button.

2. Select the **child asset**.

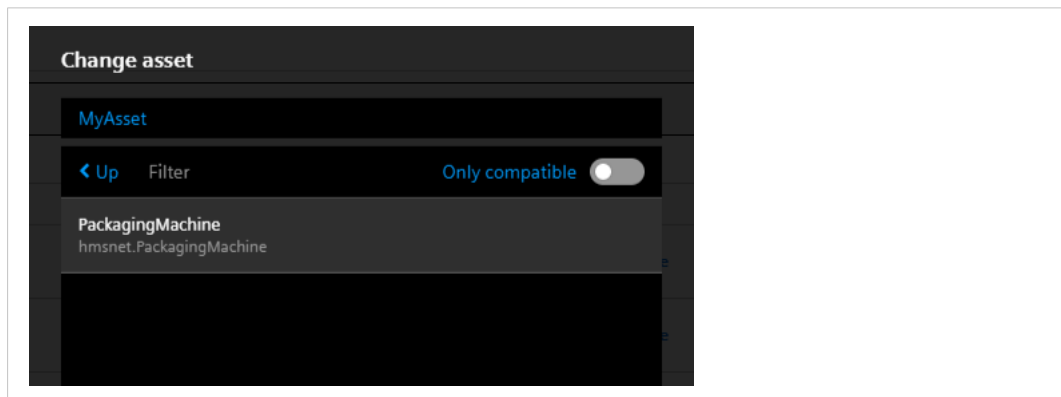


Fig. 21 Selection of child asset — 1

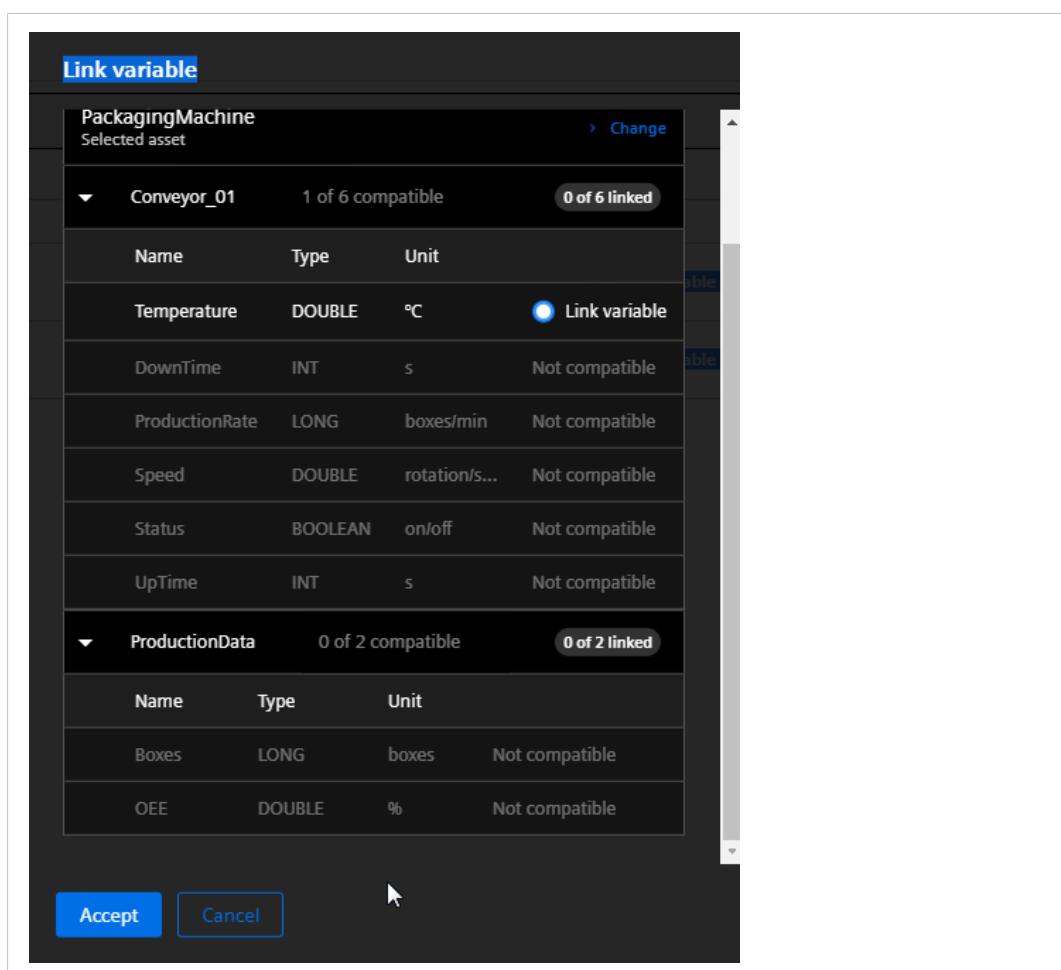


Fig. 22 Selection of child asset — 2

3. You are now able to select the corresponding variable to map to the Ewon tag.

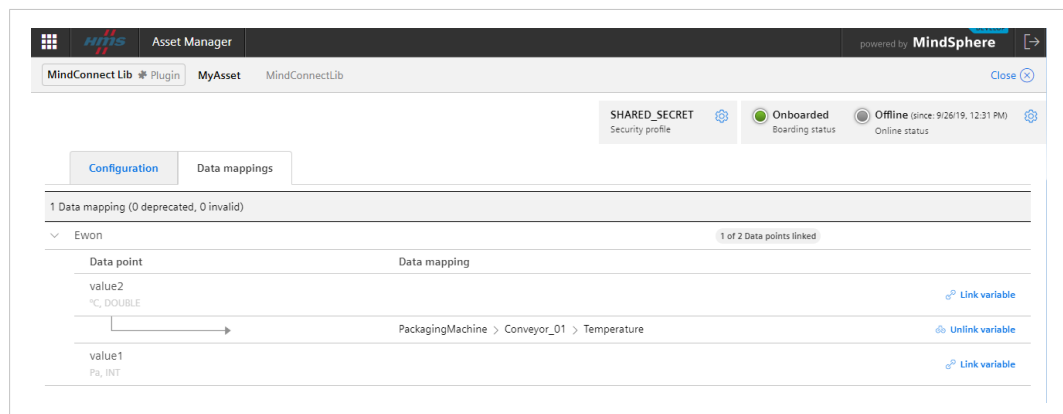


Fig. 23 Map MindSphere® variables to Ewon tags

Proceed like this for all Ewon tags you want to link to MindSphere® variables.

6.3 Display Data in MindSphere®

Once you have mapped all the variables, you can use the *Fleet Manager* inside MindSphere® to display the exported data.

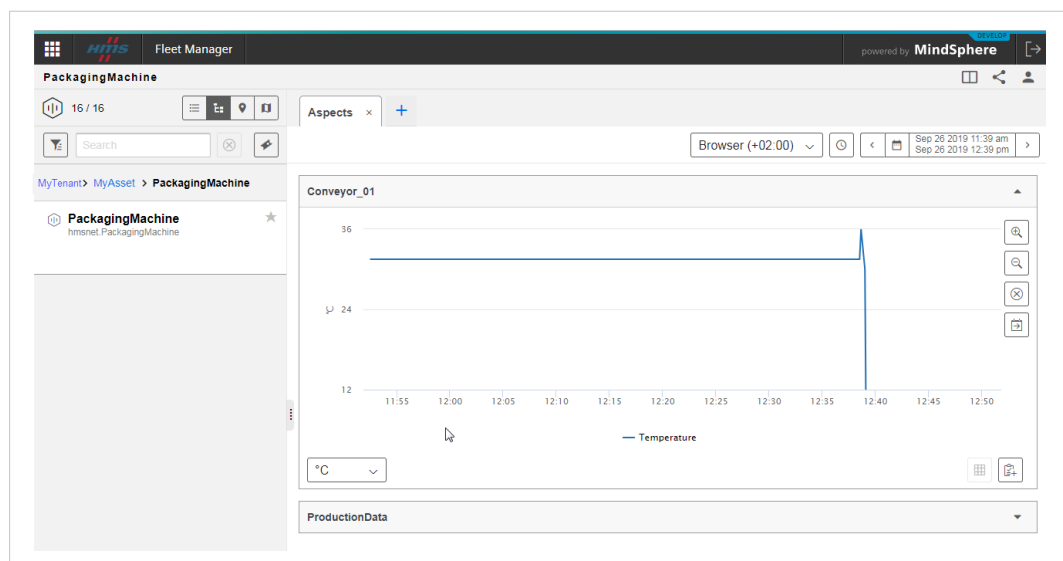


Fig. 24 MindSphere® dashboard

A Export Filtered Data to MindSphere®

The *Data Management* feature of the Ewon allows the filtering of data which is sent out.

This filtering allows you to choose only a part of the Ewon tags to be sent to MindSphere®.

To create a filter inside the *Data Management* configuration windows of the Ewon:

1. Go to **Setup ► System ► Main ► Net Services ► Data Management** section from the left-side menu of the Ewon web interface
2. Select one or multiple **tag groups**.

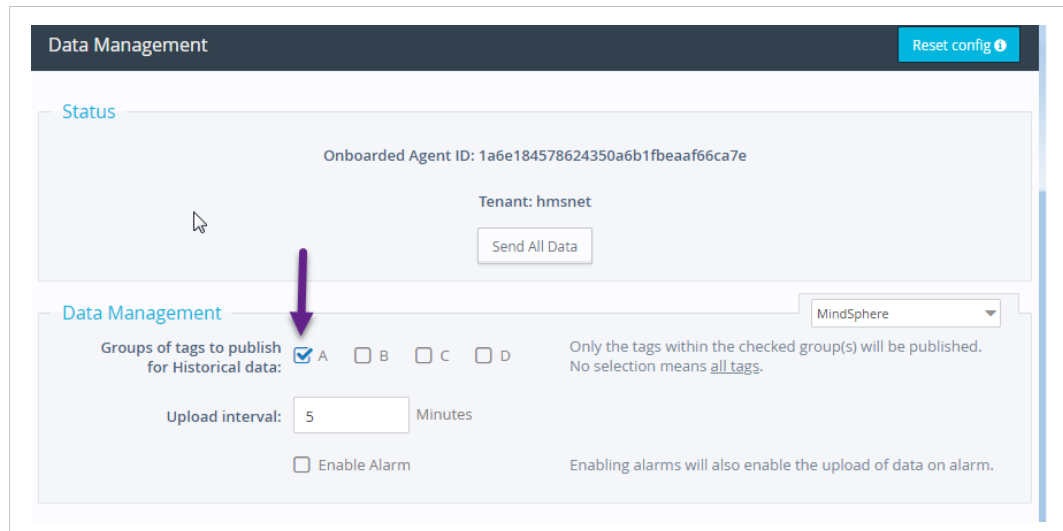


Fig. 25 Tag group selection for data management

3. Go to the **Tags ► Values** section from the left-side menu of the Ewon web interface.
4. Switch the mode to **<SETUP>**.

5. Select the **corresponding tag group** inside each Ewon tag you would like to export.

Create a new Tag

Logging Interval: 60 Seconds (set to 0, it will enable Deadband logging only)

Real Time Logging ☐ Real Time Logging Enabled

Tag Visibility

Global settings

Published value: Ewon value * 1 + 0

REMARK: Published value is unsigned 16 bits for ModbusTCP and signed 32 bits for SNMP

Modbus TCP ☐ Enabled

Register: 1 ☐ Use 32-bit format (not available for booleans)

SNMP ☐ Enabled

OID: 1 Value published: .1.3.6.1.4.1.8284.2.1.3.1.11.1.4.OID (Max value 32767)

Key Performance Indicators (KPI) ☐ Enabled

Tag groups

☒ Group A ☐ Group B ☐ Group C ☐ Group D

Add Tag

Fig. 26 Tag group selection for tag

B Firewall Settings

If you did not configure your Ewon to connect to Talk2M, then you need to set manually the security settings of the Ewon.

To activate the WAN / LAN firewall and allow only outbounds on the Ewon, proceed as follows:

1. Go to **Setup** ► **Communication** ► **Networking** ► **Security** section from the left-side menu of the Ewon web interface.
2. Set the **<WAN Protection level>** to **Discard all traffic excepted VPN and initiated traffic**.
3. Disable the **<WAN IP Forwarding>**.

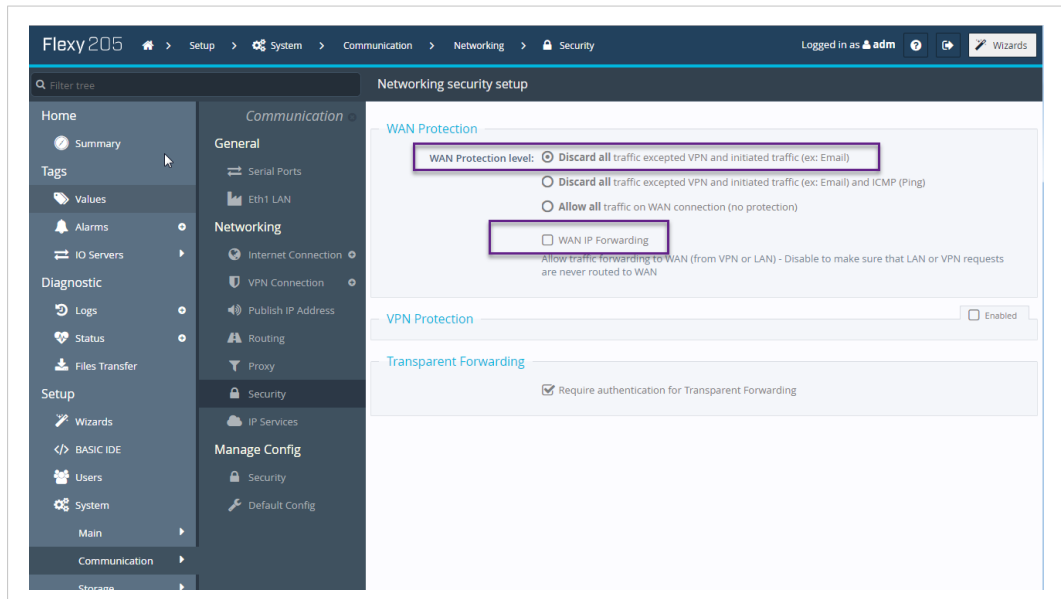


Fig. 27 Firewall for WAN / LAN control

4. Reboot the Ewon to apply the modifications.

