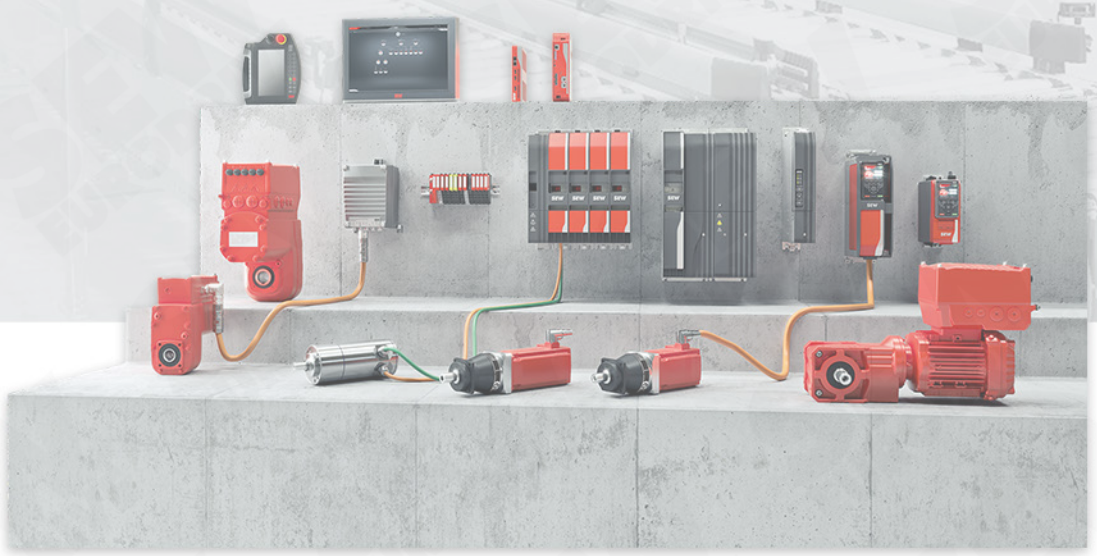
Product Training Workbook



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MOVI-C® modular automation system

DriveRadar®

SmartDataCollector

O101

DRIVE ACADEMY®

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Make sure that the operating instructions are made available in a legible condition to the system and operating managers, as well as to persons who work on the device under their own responsibility.

Objectives of this training document

- Users should be able to use the SmartDataCollector and derive or create rules for preventive maintenance

Other applicable documents:

- DriveRadar® SmartDataCollector manual
- DriveRadar® SmartDataCollector General Library manual

If you have any questions or suggestions, please contact Driveradar® Support and DriveAcadamy®.

DriveRadar® support
Tel. +49 (0) 7251 75-37611
DriveRadar@sew-eurodrive.de

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Str. 42
D-76646 Bruchsal
Tel. +49 (0) 7251 75-3911
www.driveacademy.sew-eurodrive.de

Meaning of the symbols:

Operating notes

Information

Tip

Practical task

Additional documentation

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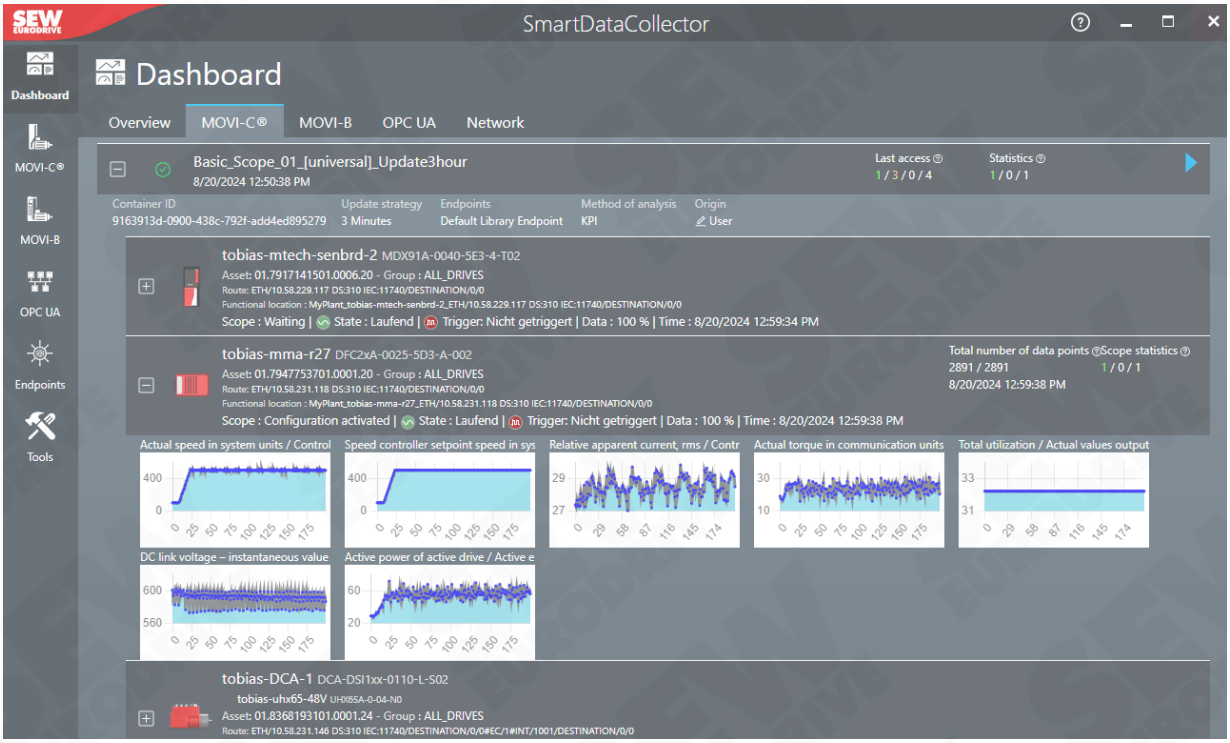
Workbook steps

The workbook provides a practical insight into the DriveRadar® SmartDataCollector. In addition to the initial startup of the software, the workbook explains all setting options for collecting data from MOVI-C® and MOVI-C® predecessor devices and passing it on to an endpoint.



Theory

1. **Introducing DriveRadar® and DriveRadar® SmartDataCollector**
3. **Presentation of the DriveRadar® SmartDataCollector interface**
4. **Settings and data backup in DriveRadar® SmartDataCollector**
10. **Standard container with example based on Device Identity**

Practice

2. **Installation and licensing of the DriveRadar® SmartDataCollector**
5. **Integration into the network and device scan**
6. **Creating and assigning metadata: Functional location, system level, and application type**
7. **Creating device groups**
8. **Creating endpoints**
9. **Creating and using parameter containers**
11. **Creating and using scope containers**

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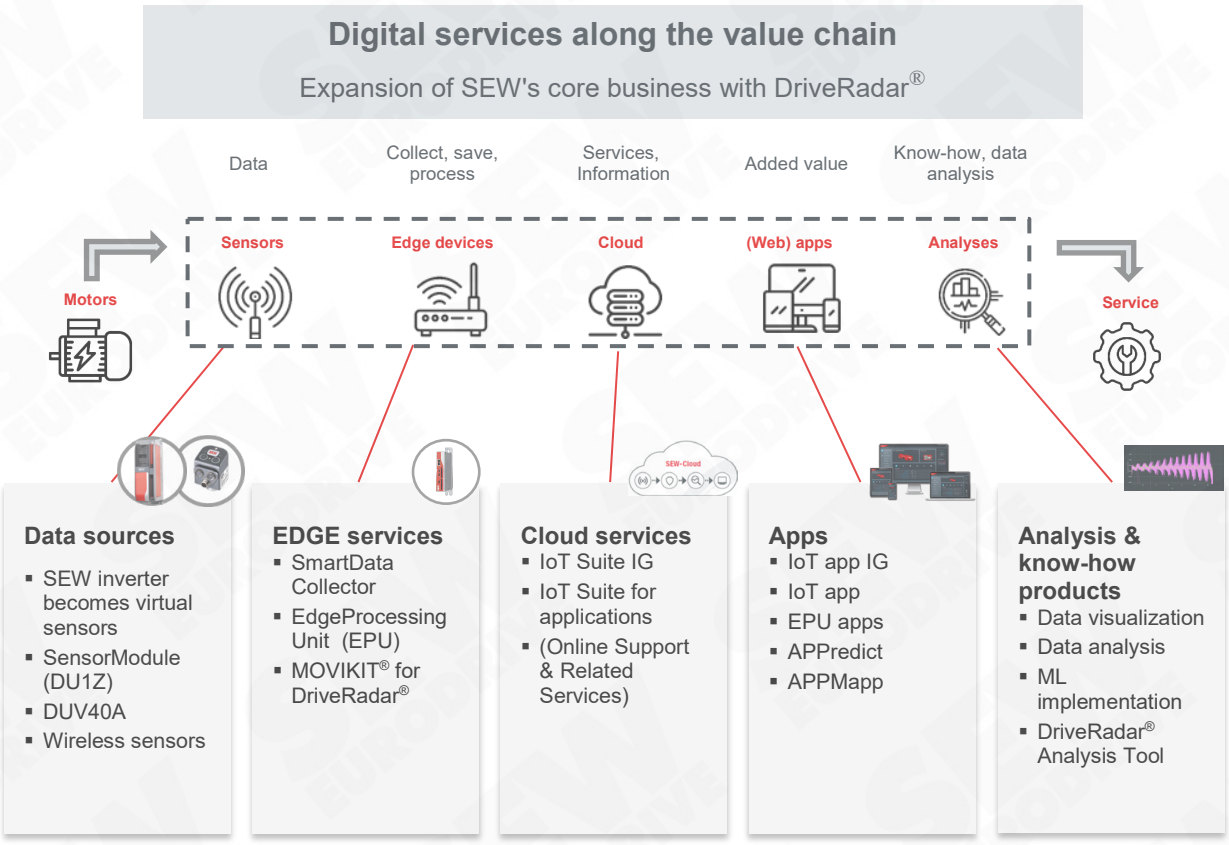
1 Introducing DriveRadar® and DriveRadar® SmartDataCollector

Objectives

You will understand

- the basic product portfolio of DriveRadar®
- the approach that DriveRadar® takes

Under the DriveRadar® brand, SEW-EURODRIVE offers intelligent, scalable services throughout the entire life cycle of individual products, solutions and complex systems.
The aim of these products and services is to improve the availability of the products and services systems significantly.
The product portfolio ranges from sensors, various edge devices and software to cloud services and the analysis options they offer. Apps are also available on different devices.



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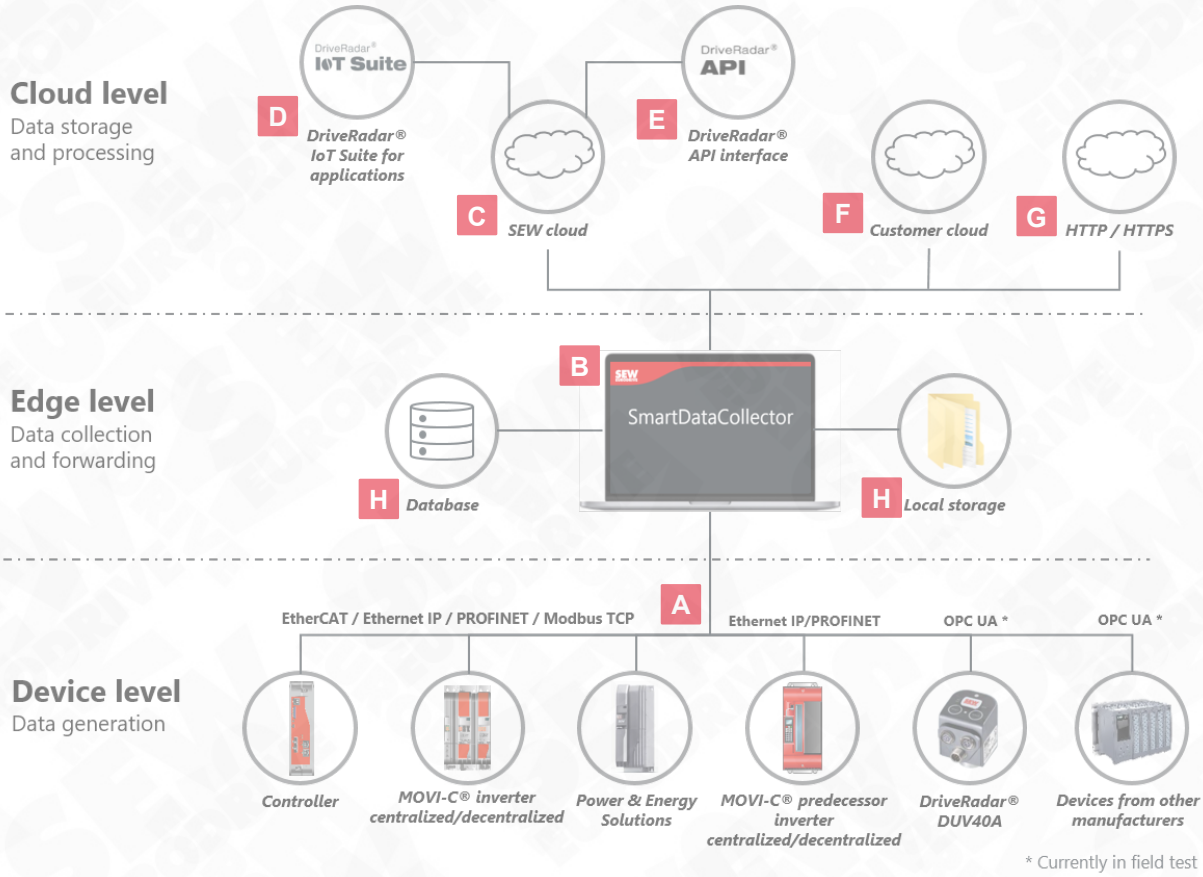
1.1 How does it work?



- **A** **Data generation** with devices from SEW-EURODRIVE and other manufacturers
- **B** Data collection and forwarding with the **DriveRadar® Smart Data Collector**
- **C** Data processing in the **SEW cloud**
- **D** Use and display of the data in the **DriveRadar® IoT Suite**
- **E** Forwarding of the processed data via **DriveRadar® API connection**
- **F** Data storage in the **customer cloud**
- **G** Storage at an **http/https endpoint**
- **H** Storage on the **local memory** on the PC or in the **database**

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1.2 What is the DriveRadar® SmartDataCollector?

The **DriveRadar® SmartDataCollector** automatically collects IIoT (Industrial Internet of Things) usable device and sensor data from electronic drive systems of MOVI-C® and MOVI-C® predecessor devices from SEW-EURODRIVE. In addition, data from manufacturer-independent system components can be accessed via the OPC UA (Open Platform Communications Unified Architecture) communication protocol.
The software stores the data on target IT systems and thus allows convenient access to this information. The recorded data can include both scope recordings and individual parameters and is saved in the form of JSON files.

The software can be set up on process-related customer IT systems or edge units. Only one instance of the software is instalable on each device. The devices are connected to the DriveRadar® SmartDataCollector wireless or cable-based via existing Ethernet-based network channels (e.g. PROFINET, Ethernet) without hardware retrofitting.
Real-time processing of the data extraction depends on the technical framework conditions and can therefore not be guaranteed.

Influencing factors include:

- Number, type and topology of devices
- Bandwidth and utilization of the network connection
- Number of configured parameters/scopes
- Number of configured containers
- Set cycletime

1.3 Other use of the SmartDataCollector in the DriveRadar® product portfolio

1.3.1 DriveRadar® IoT Suite

The DriveRadar® IoT Suite for applications enables continuous and reliable monitoring for the maintenance of drive components, system solutions and processes. The modular web application works with the collected data of the DriveRadar® SmartDataCollector and enables continuous monitoring as well as targeted evaluation and analysis of the device data. Based on the findings, rules can be derived and created that lead to specific instructions for action in the sense of preventive maintenance. At the same time, application knowledge can be generated that can be used to optimize individual components and the entire system.

1.3.2 DriveRadar® EdgeProcessingUnit

The DriveRadar® EdgeProcessingUnit (EPU) is an edge device for a variety of applications. In addition to the basic functions of data collection and forwarding, local data processing and analysis offer elementary possibilities for condition monitoring. As a result, the information content of the data can already be increased at the edge level, thus reducing the amount of data to the cloud level. In addition, SEW-EURODRIVE's expertise is made available in various apps to generate added value for the customer. The aim is to use high-quality data and insights instead of simple device raw data for local implementation of condition monitoring of devices and entire applications.

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2 Installation and licensing of the DriveRadar® SmartDataCollector

Objectives

You will be able to

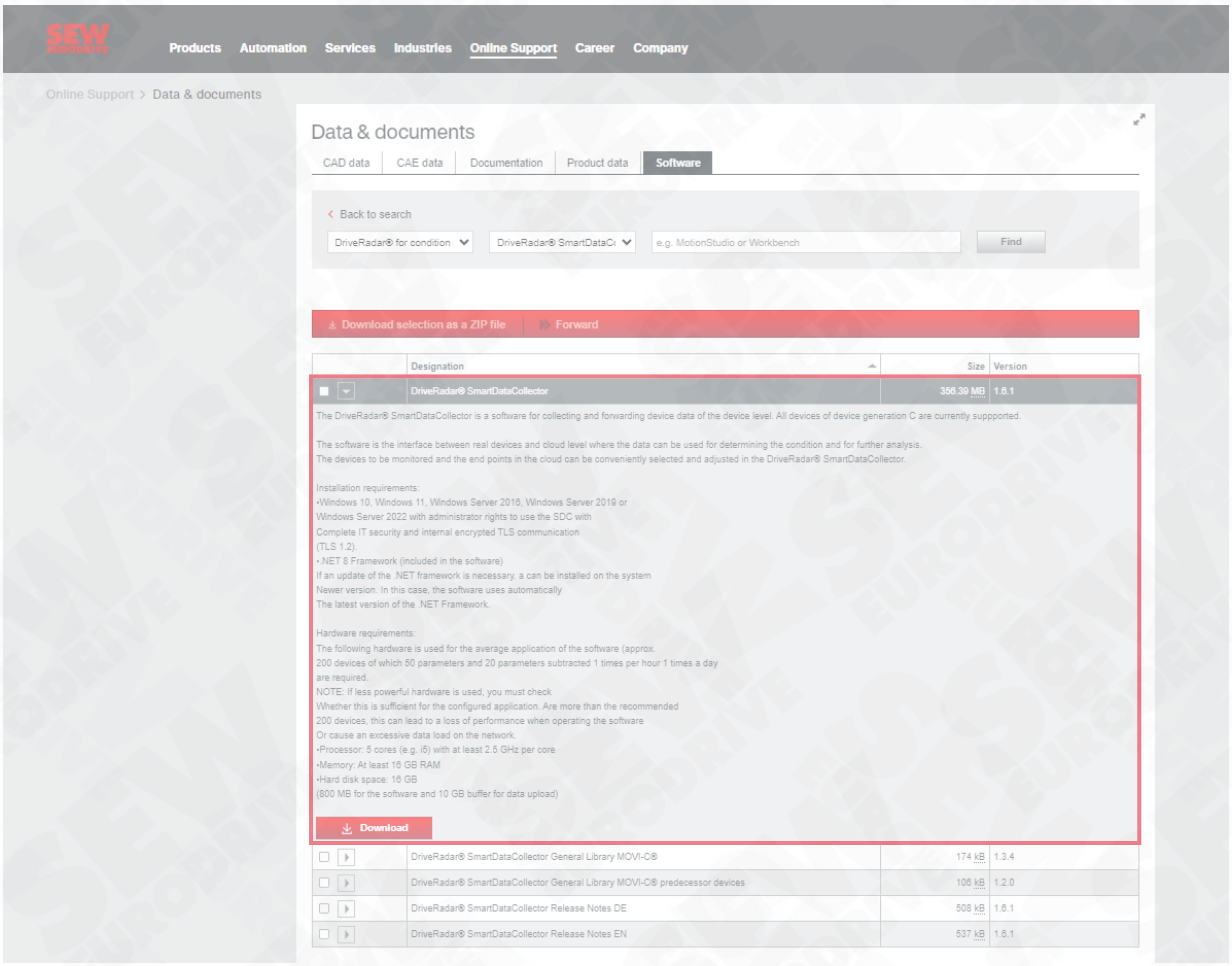
- download and install DriveRadar® SmartDataCollector
- check and activate the license
- install libraries for DriveRadar® SmartDataCollector

Startup includes all the steps required for collecting and forwarding the data, from installation to activation of the containers and the associated automatic data extraction.

2.1 Download DriveRadar® SmartDataCollector from SEW homepage

The DriveRadar® SmartDataCollector software can be downloaded from the **Online Support** tab of the SEW website.
Additional licenses are required for operation (see Chapter 2.3).

1. Download DriveRadar® SmartDataCollector from Online Support



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2.2 Install DriveRadar® SmartDataCollector

If a version of the DriveRadar® SmartDataCollector is already installed on your computer and you want to install a new version, you can proceed in the same way. During installation, the old version is automatically overwritten and the previous configurations are transferred to the new version.

1. Installation

Prerequisite for installation:

- ✓ The installation file has been downloaded and is available locally
- ✓ Your user has administrator rights on the computer

1 Open the **SmartDataCollector setup X.msi** installation file

The installation wizard opens.

2 Follow the **installation wizard**

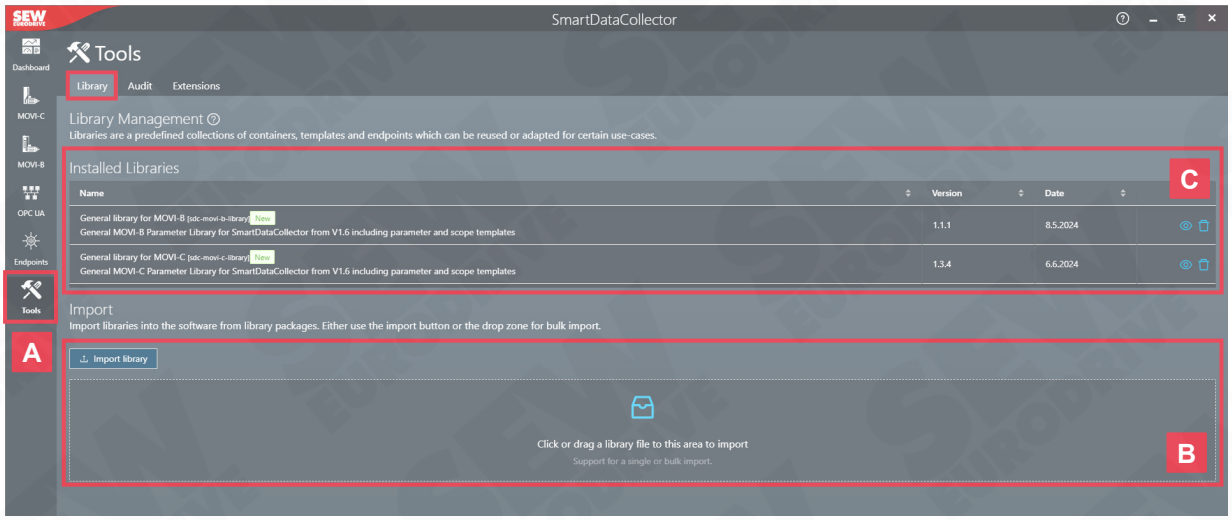
After confirming the license terms and setting the target directory, the software is installed on your computer. A desktop shortcut to the software is automatically created.

Once the DriveRadar® SmartDataCollector has been installed, a **library with standard containers** can be installed for MOVI-C® predecessor devices and MOVI-C®. The libraries offer prefabricated containers that enable reliable monitoring of the devices.

2. Import SmartDataCollector libraries

The libraries can be accessed again via the **Online Support** of the SEW website (see Chapter 2.1). The **MOVI-C_Library_X.sdclib** and **Predecessor_Devices_X.sdclib** files are then imported into the DriveRadar® SmartDataCollector.

3. Import libraries



A Switch to the **Tools** menu in the **Library** tab

B You can import library packages from the local folder structure by clicking **Import library**. Alternatively, you can **drag and drop** library packages into the framed area

C The imported libraries are then displayed in the **Installed Libraries** field

After installation, the standard containers are visualized in **template management** in the **Templates** tab of the **MOVI-B** and **MOVI-C®** menu items:

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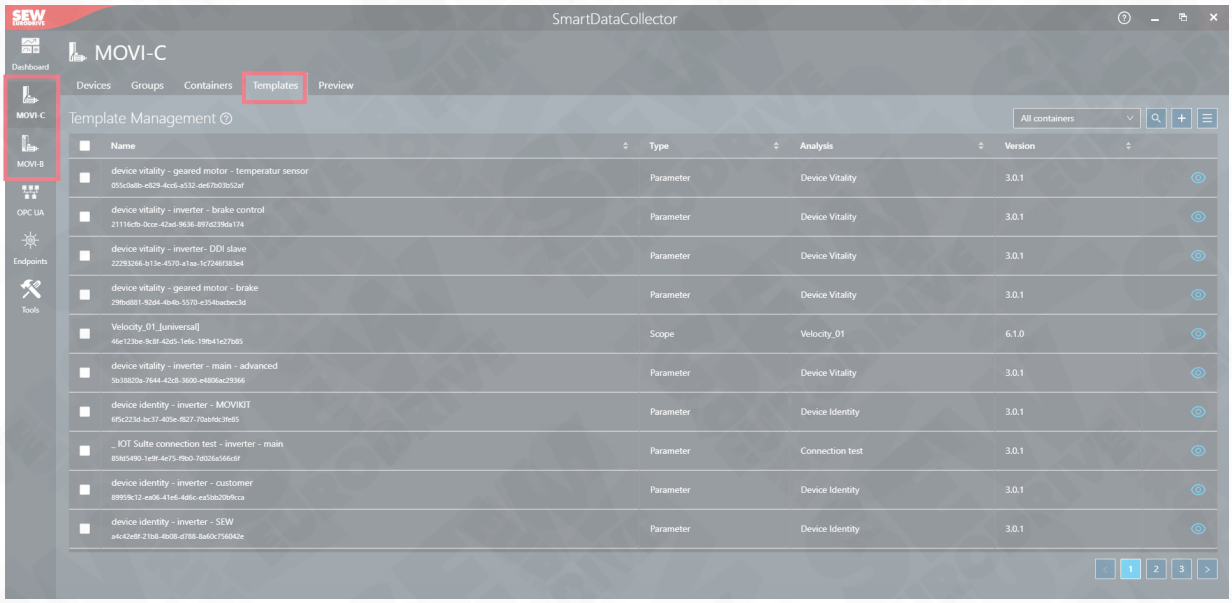

2.3 License DriveRadar® SmartDataCollector

License types & operating modes

The license types of the DriveRadar® SmartDataCollector depends on the possible operating modes. A distinction is generally made between stand-alone mode and IoT Suite mode. If both license types are activated, dual mode also exists, which combines the properties of both operating modes.

In addition to a brief introduction to the various license types, the **stand-alone** license is increasingly highlighted in this workbook.

SDC standalone mode

- Different licenses with different numbers of axes and OPC-UA servers
- Optional: 7 day test license available
- Max. capturing speed (100 ms)
- Full flexible settings in the SDC
- JSON files are send “open” (no encryption)
- SDC-License is connected to a unique hardware
- Not suggested to use with IoT Suite

IoT Suite mode

- No license key and fee for SDC
- No data volume limitation
- No device limitation
- Max. capturing speed (1 min)
- JSON files are send encrypted (ZIP-files, no customer usage)
- License could be used on several PC’s in parallel
- License is connected to a plant in the CDM / IoT Suite

Stand-alone mode

Is a license for single operation that is bound to the hardware (e.g. the computer). A separate license must therefore be purchased for each computer that uses the DriveRadar® SmartDataCollector. The available licenses differ in the number of monitored axes. The maximum number of devices is 500. All monitored devices at the inverter level are counted as one axis. For example, subcomponents, options, and higher-level controllers are not counted as devices, double axes are counted as 2 devices. All telemetry and configuration data is transmitted unencrypted.

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IoT Suite mode

For using the DriveRadar® SmartDataCollector as a data collector for the DriveRadar® IoT Suite. The collected data can only be transferred to the IoT Suite. The maximum number of devices is 500. All telemetry and configuration data is transmitted encrypted and signed as a ZIP archive.

Dual mode

To use the DriveRadar® SmartDataCollector as a data collector for the IoT Suite with the additional option of transferring the data to another endpoint. Dual mode is active when both a stand-alone license and IoT Suite mode are activated. The number of monitored devices is limited to the number of devices of the stand-alone license. All telemetry and configuration data is transferred encrypted and signed as a ZIP archive.

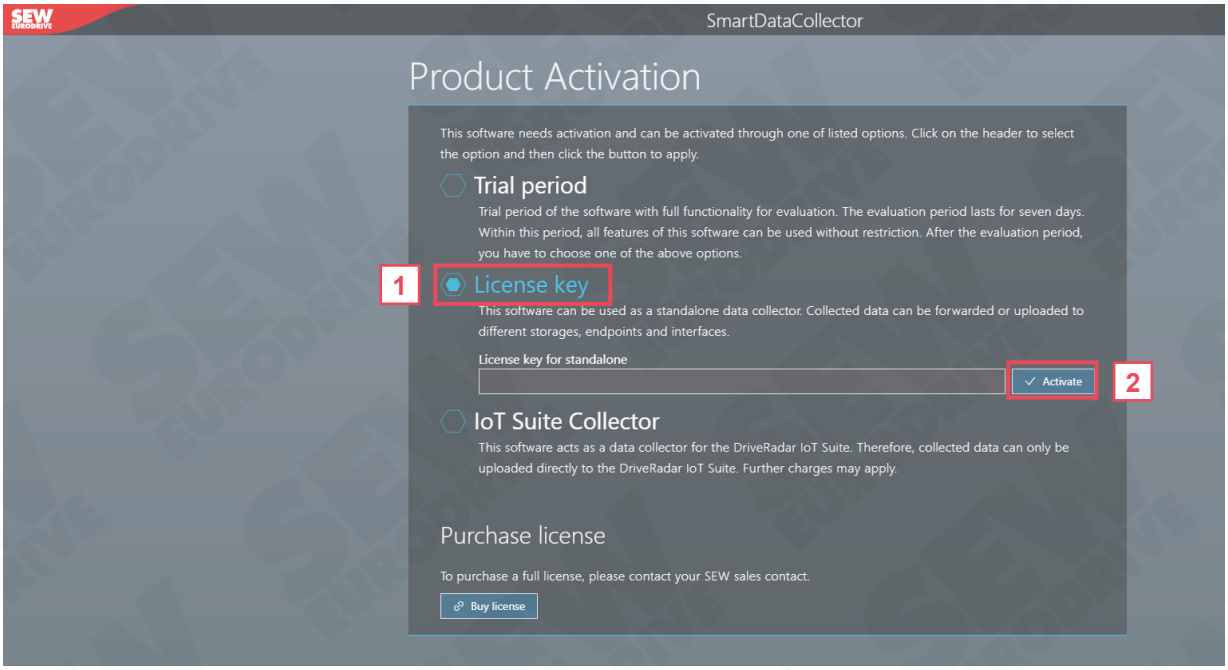
EPU mode

In conjunction with the DriveRadar® EdgeProcessingUnit (EPU) from SEW-EURODRIVE, the DriveRadar® SmartDataCollector is indirectly licensed. The operating principle of the software is the same as stand-alone mode – licensing is based on the number of axes in the same way.

1. Licensing when starting the software

When the software is started for the first time, a licensing window opens automatically in which the **product activation** can be performed.

The **trial period** can be used to test the software.



1 Select **License key** and enter the license key available to you in the visible field

2 Confirm your entry by clicking the **Activate** field

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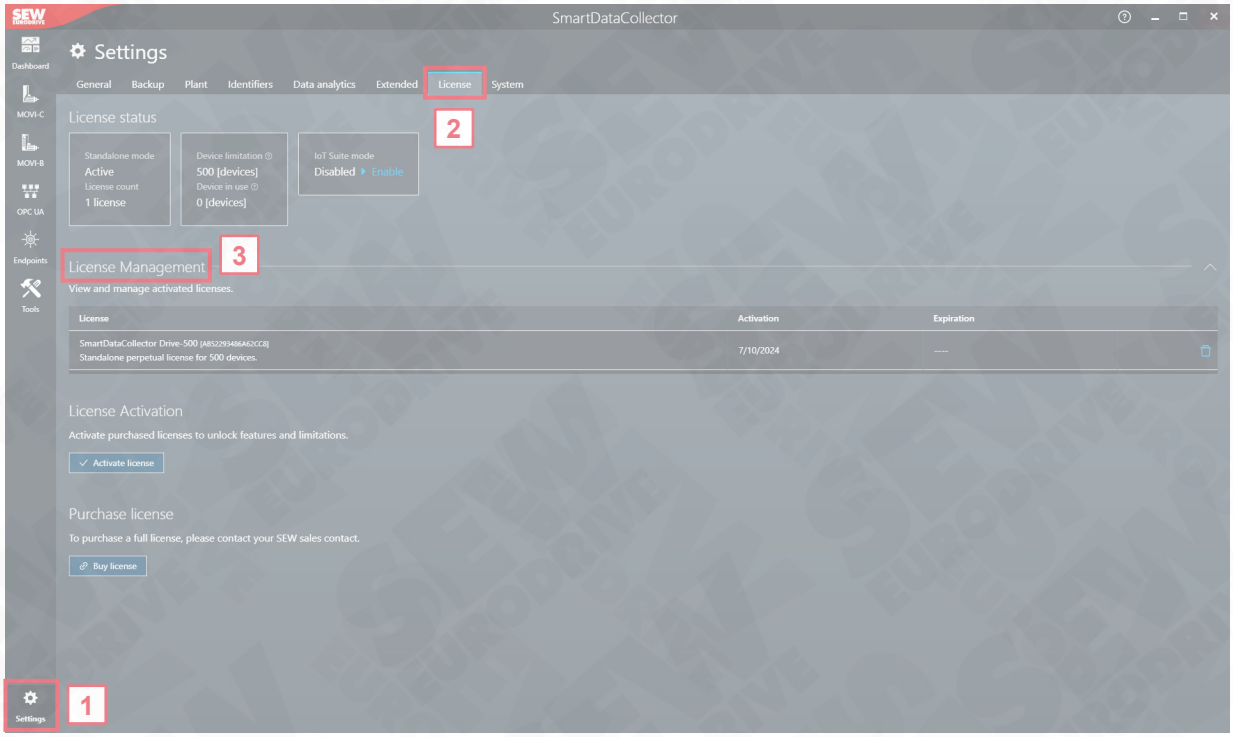
2. Checking the license or licensing during the trial period



1 Open the **Settings** menu

2 Select the **License** tab to view the current license status of the software

3 The activated licenses can be viewed under **License management**. If there is no license yet, you can find the next EURODRIVE to contact by clicking **Buy license**. If a license key already exists, the license key can be activated under **Activate license**

If the DriveRadar® SmartDataCollector is not operated in stand-alone mode, but rather as a data collector for the DriveRadar® IoT Suite, the **IoT Suite mode** must be selected. The license can be activated here in 2 ways.

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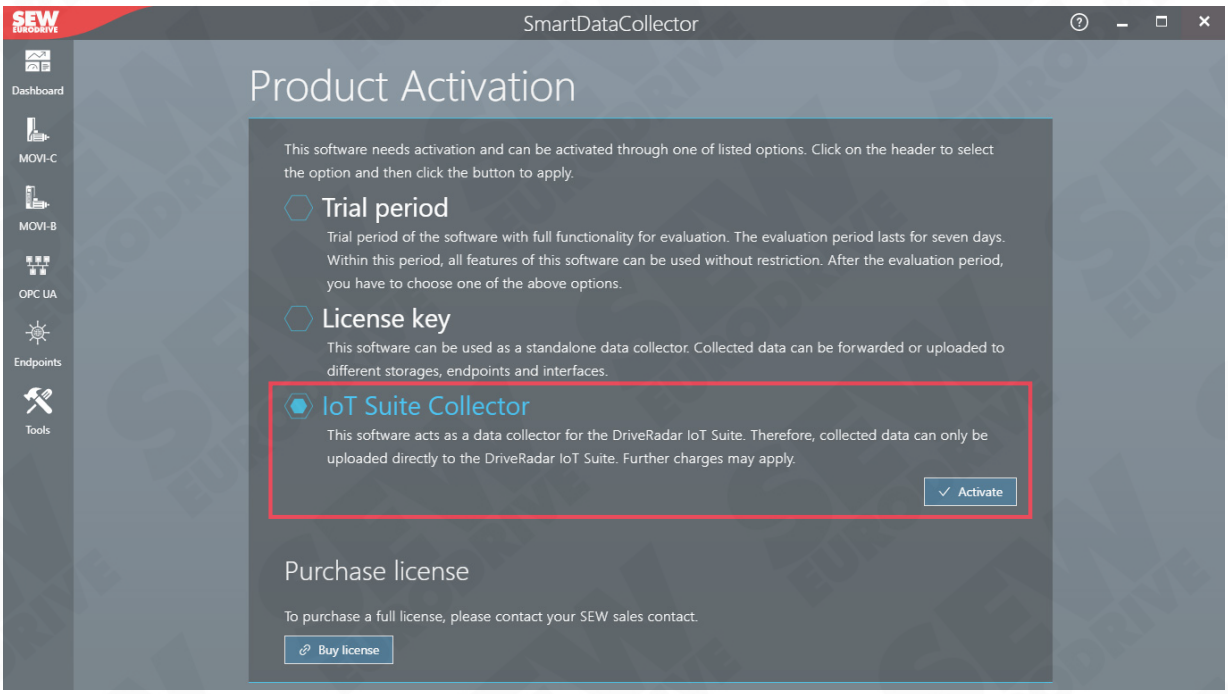
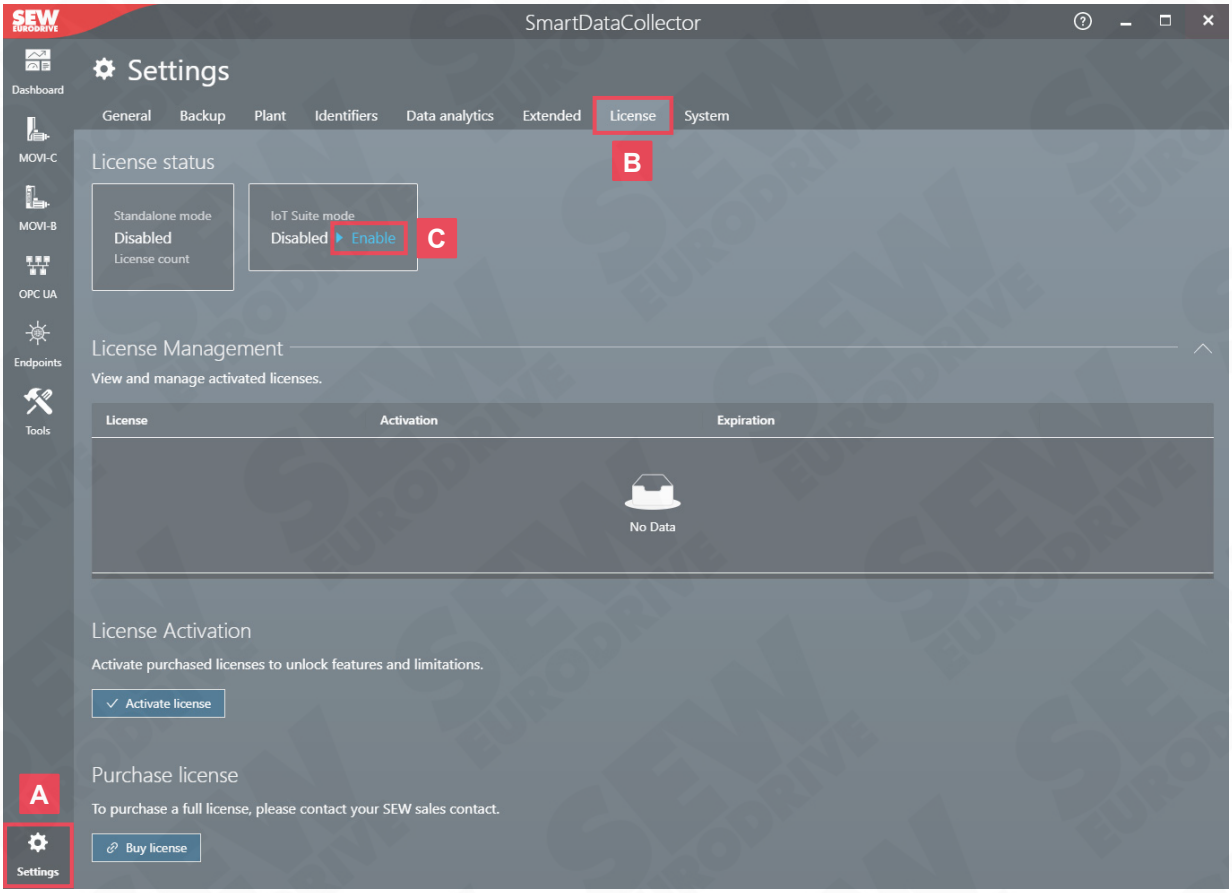
Either directly at the start of the software:



Or as follows after initial setup with the test time period



A Open the **Settings** menu

B Select the **License** tab

C The IoT Suite mode can now be **activated** under **License status**

If stand-alone mode has already been activated by a license key and IoT Suite mode is also activated, this is **dual mode**.

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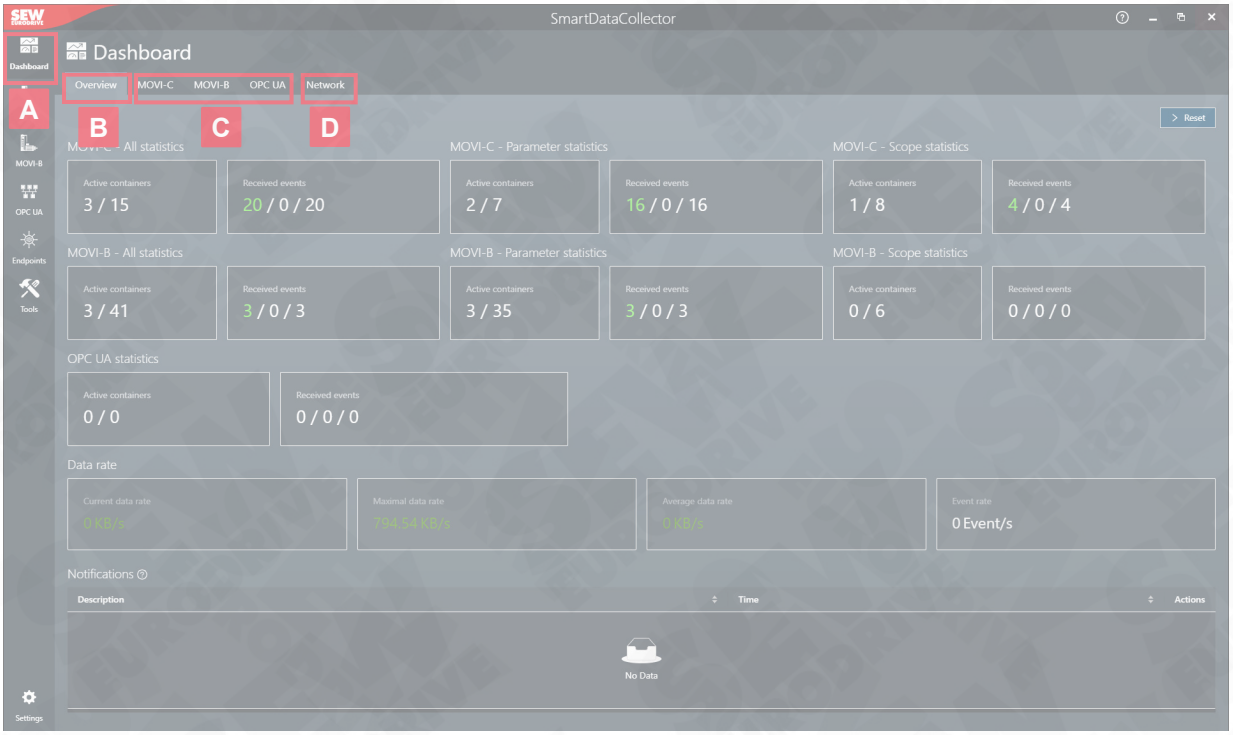
3 Presentation of the DriveRadar® SmartDataCollector interface

Objectives

You will be able to

- navigate in the DriveRadar® SmartDataCollector interface
- find important menu items and settings
- identify important status messages of the software

3.1 Dashboard



A The **Dashboard** menu is the start screen of the software

B The **Overview** tab shows the current status as well as the diagnostic values for the data flow

- All active MOVI-B, MOVI-C® and OPC UA containers
- All events and the event rate
- Current, maximum, and average data transmission rate
- Notifications of all actions of the software

C The **MOVI-C® / MOVI-B / OPC-UA** device tabs provide a detailed view of the status of the respective devices

- Status and last data of the respective containers (scope and parameters)
- Error and success messages of the respective devices
- Displays the connected devices, device components, and servers

D **Network** tab contains statistics on data transmission

- Network statistics with data transmission rate and current, maximum and average network load of the network adapter
- Endpoint statistics (successful/faulty)
- Container statistics (successful/faulty)

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3.1.1 Devices

The **MOVI-C® / MOVI-B / OPC-UA** device tabs display all containers created in each case, their assigned devices, as well as statistical values and error messages.

A Container created for a device type

B One device assigned to a container

C Data acquisition configured for the device (in this case: Scope recording)

D Button for manually triggering data acquisition

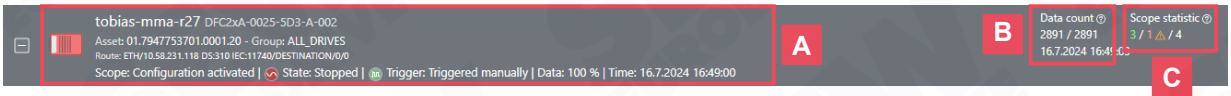
E Menu with advanced functions

For devices for which **parameter recording** is configured, the following data must be specified (from left to right and top to bottom)

A Unique PROFINET name or device signature and device identification.
Unique serial number of the device (asset ID) and group to which the device is assigned.
Network route for communication with the device

B Statistical values for the last read access

For devices for which a **scope recording** is configured, the following data must be specified (from left to right and top to bottom)



A Unique PROFINET name or device signature and device identification.
Unique serial number of the device (asset ID) and group to which the device is assigned.
Network route for communication with the device.
Status of the scope recording (including state, trigger, data)

B Data counter for data acquisition

C Statistical values for the last data acquisition

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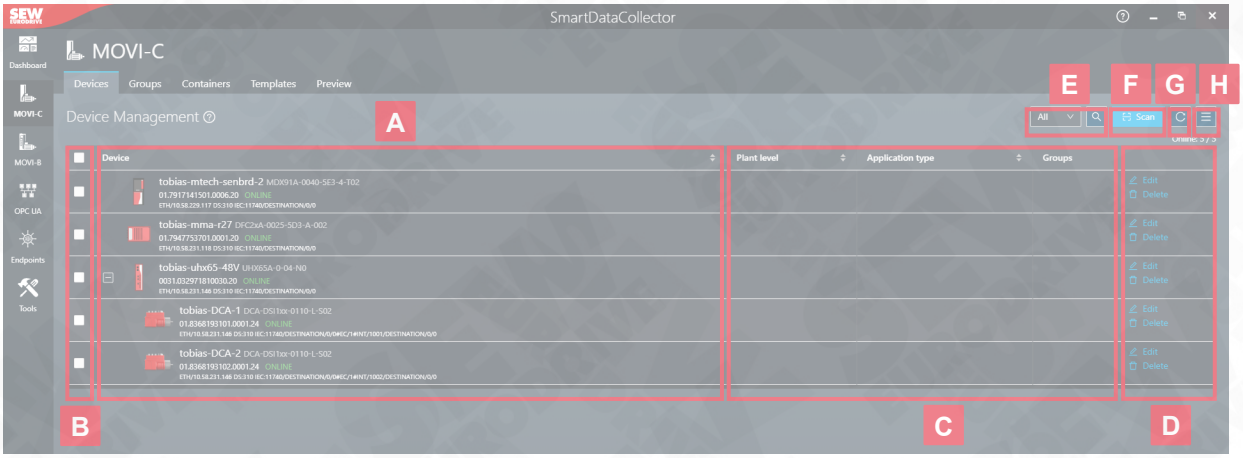
3.1.2 MOVI-C® / MOVI-C® predecessor devices

The **MOVI-C®** and **MOVI-B** (MOVI-C® predecessor devices) menus are used to manage the corresponding devices or device options and to add and configure the associated unit group, containers and templates.



A Devices/device options detected and adopted during network scan with:
- Unique PROFINET name or device signature
- Unique serial number of the device (asset ID) and current device availability
- Network route for communication (IP address, EtherCAT®/SBusPLUS address, address of device options)

B Select devices for further processing

C Assignment with regard to **system level, application type** and **device group**

D Edit or delete a device

E Functions for filtering the displayed devices or device options

F Setting up and starting the network scan

G Checking device availability (online/offline)

H Menu with functions for further processing

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4 Settings and data backup in the DriveRadar® SmartDataCollector

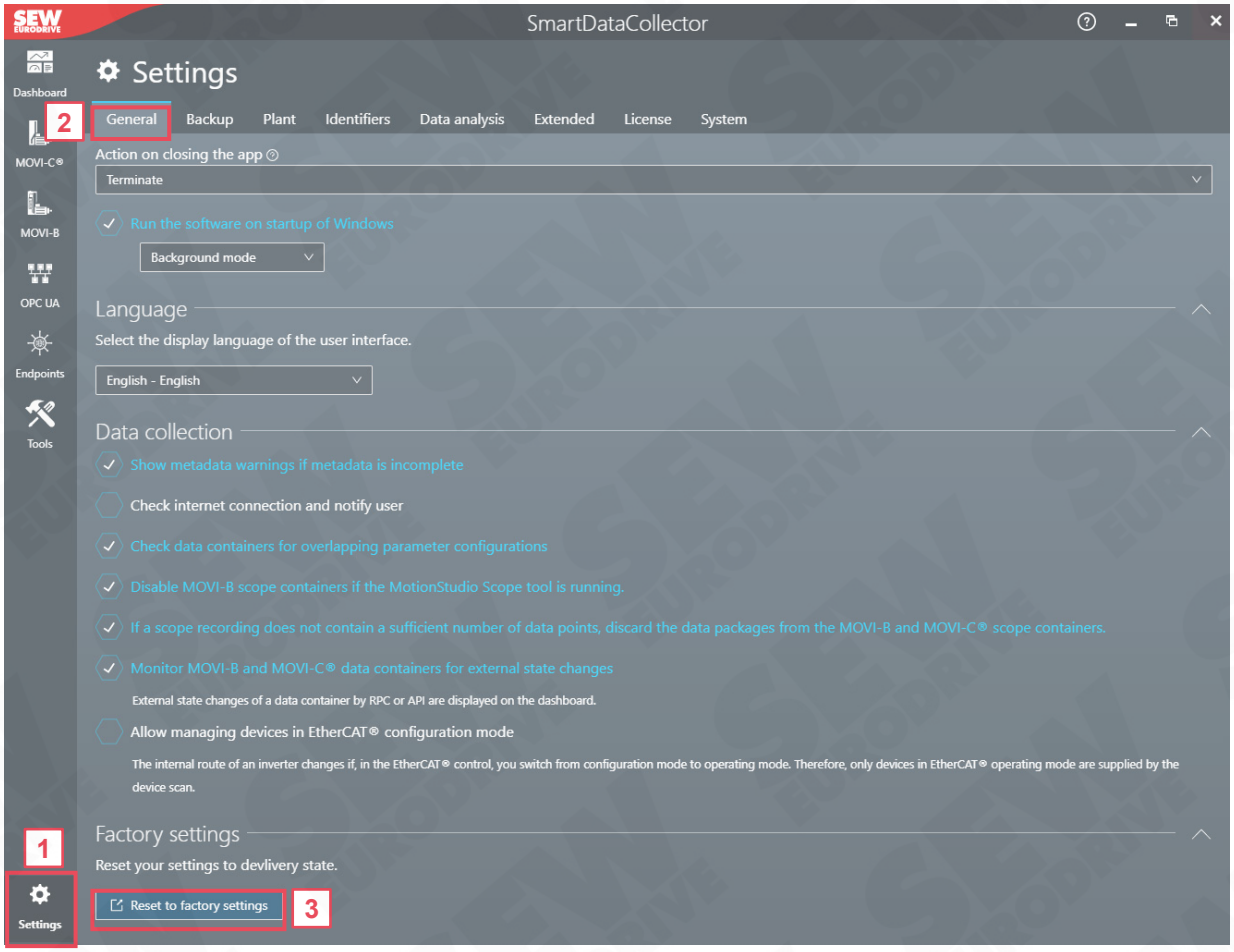
Objectives

You will be able to

- reset to factory setting
- save data and load templates
- create and load a plant template

To save startup times, there are various options that apply the settings of the DriveRadar® SmartDataCollector. The basic options for importing and exporting are described below.

4.1 Reset to factory setting



1 Switch to the **Settings** menu

2 Open the **General** tab

3 Under **Factory settings**, you can load the factory setting by clicking the **Reset to factory settings** button. **All current settings are deleted**

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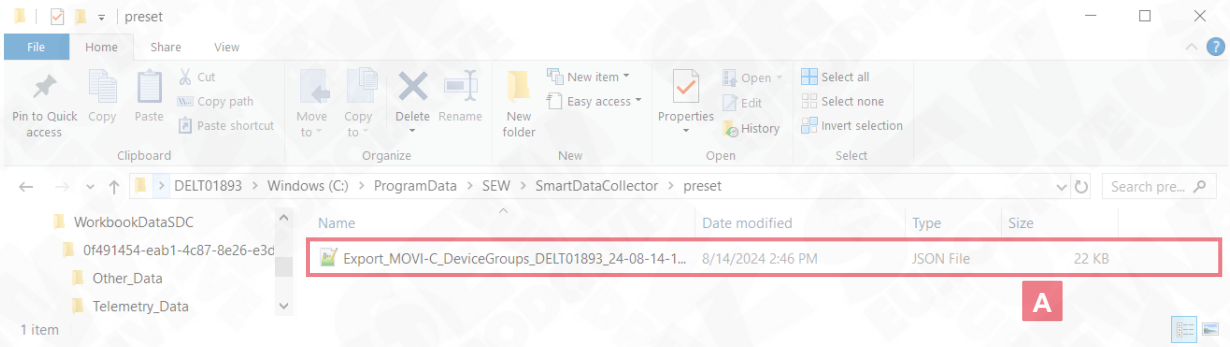
4.2 Data backup

4.2.1 Import of default settings

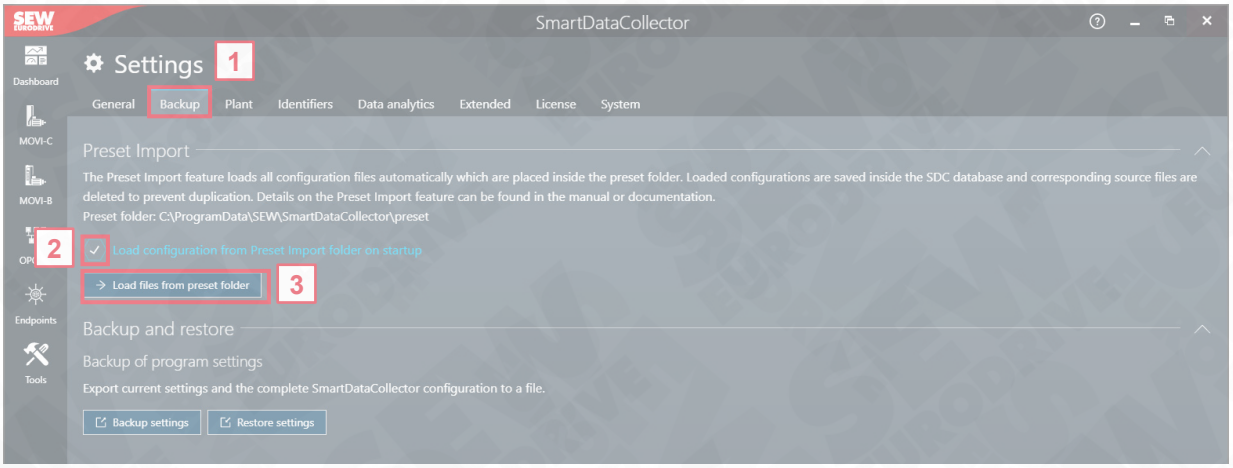
The function **Import of presets** automatically imports all configuration files from the presets directory (default path: C:\ProgramData\SEW\SmartDataCollector\preset) when the program is started or manually by clicking a button.

1. Save the export file to the preferences directory



A In the example, preconfigured device groups are inserted

2. Import default settings



1 In the **Settings** menu, navigate to the **Backup** tab

2 Activate the **check box** to automatically load the default directory **C:\ProgramData\SEW\SmartDataCollector\preset** at startup

3 You can start loading manually by clicking **Load files from preset folder**. After loading, the preferences directory is emptied again

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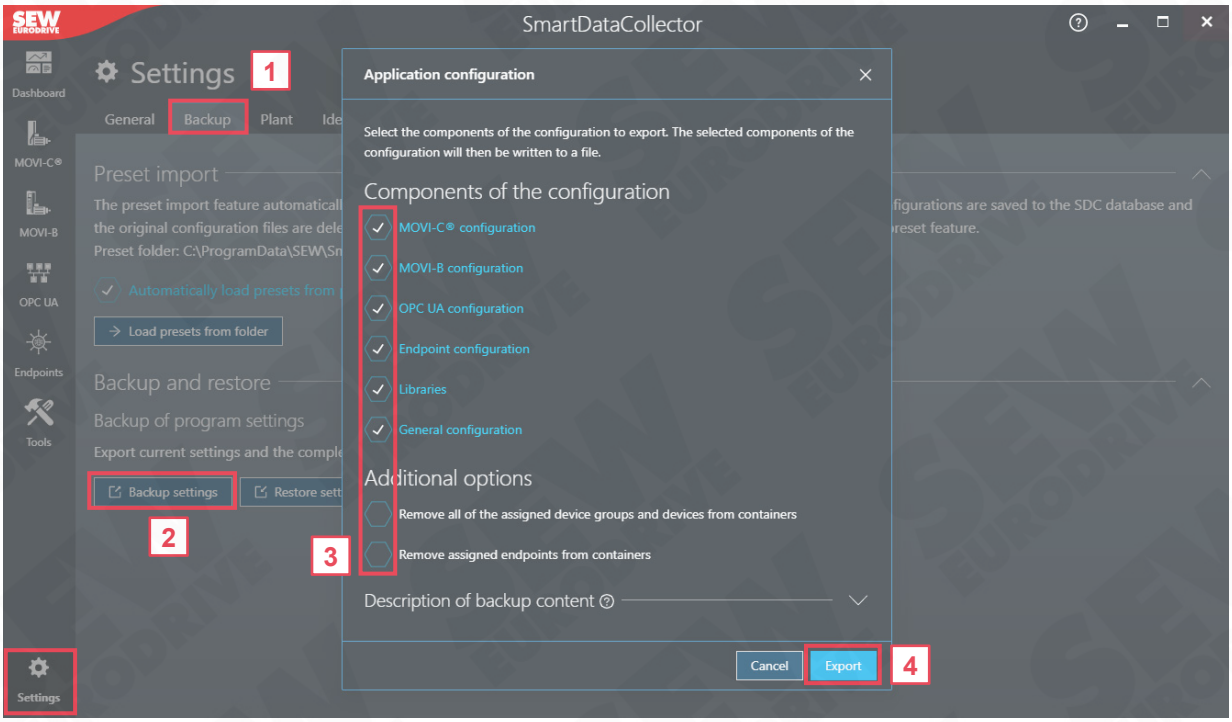
4.2.2 Backup and restore of the program configuration

The software offers the option of exporting or importing the entire program configuration. This allows all configurations to be saved and reloaded at a later time, if necessary.

1. Create backup



1. In the Settings menu, navigate to the data **Backup** tab
2. In the Backup and Restore area, click **Backup settings** → the Program configuration dialog box with export options opens
3. Make a selection in the dialog box according to your project. NOTE: The available cleaning options only delete the links of containers to device groups, devices, and endpoints. However, the device groups, devices, and endpoints themselves are included
4. Click **Export** to save your program configuration. The configuration can then be saved as a JSON file at the desired storage location

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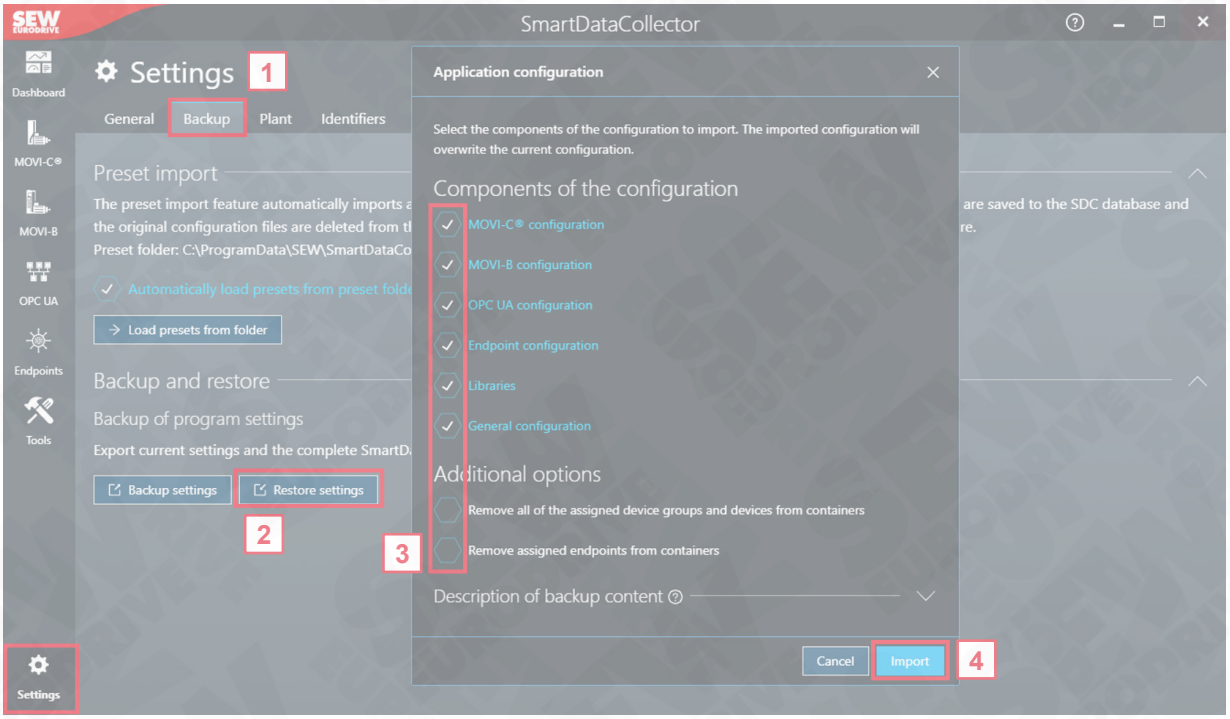
2. Restore backup



1 In the Settings menu, navigate to the data **Backup** tab

2 In the Backup and restore area, click **Restore settings** → the file browser for selecting the import file opens. Navigate to the required import file and open it

3 The Program configuration dialog box opens again – this time with selection options for importing. NOTE: The available cleaning options only delete the links of containers to device groups, devices, and endpoints. However, the device groups, devices, and endpoints themselves are included

4 Click **Import** → the program configuration is imported and applied

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5 Integration into the network and device scan

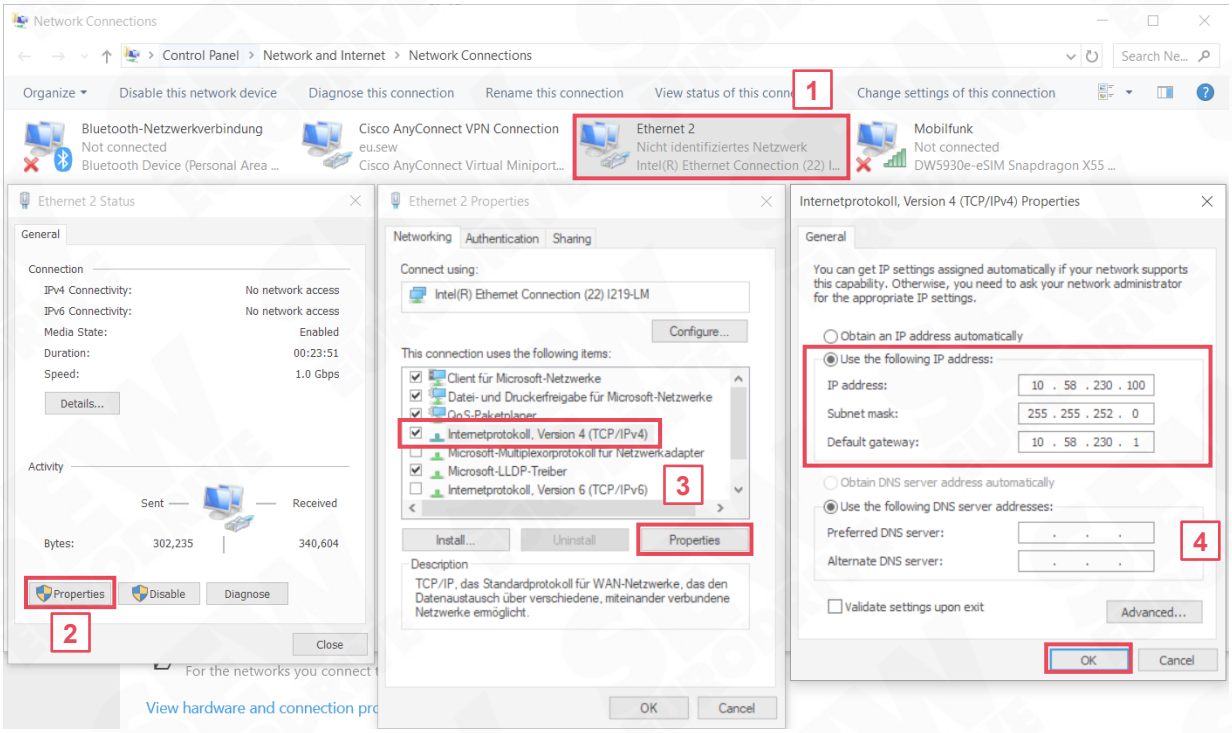
Objectives

You will be able to

- perform a device scan
- add devices for data acquisition

5.1 Prerequisites for the device scan

1. Configuring the network address of the engineering PC



1 Open the Windows network connections and **double-click** the network adapter used, **Ethernet 2** in this case

2 Edit the **Properties** of the adapter

2 Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**

3 Select an **IP address** setting **that matches the subnet of the system network**. An IP address with **192.168.10.x** would be suitable for the SEW standard IP setting 192.168.10.4.

4 Apply the settings with **OK**

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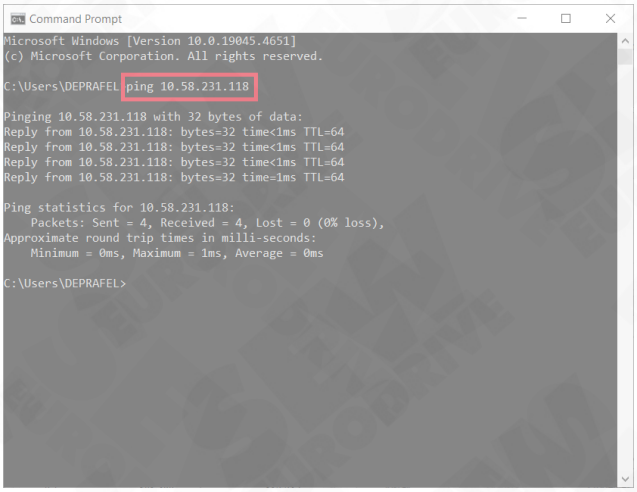
2. Check the connection with ‘ping’ command



The engineering PC requires access to the machine network via the following ports:

- Internet Control Message Protocol (ICMP) → device ping
- TCP / UDP (port 300) → MOVILINK / DataStream

If necessary, check the firewall settings.

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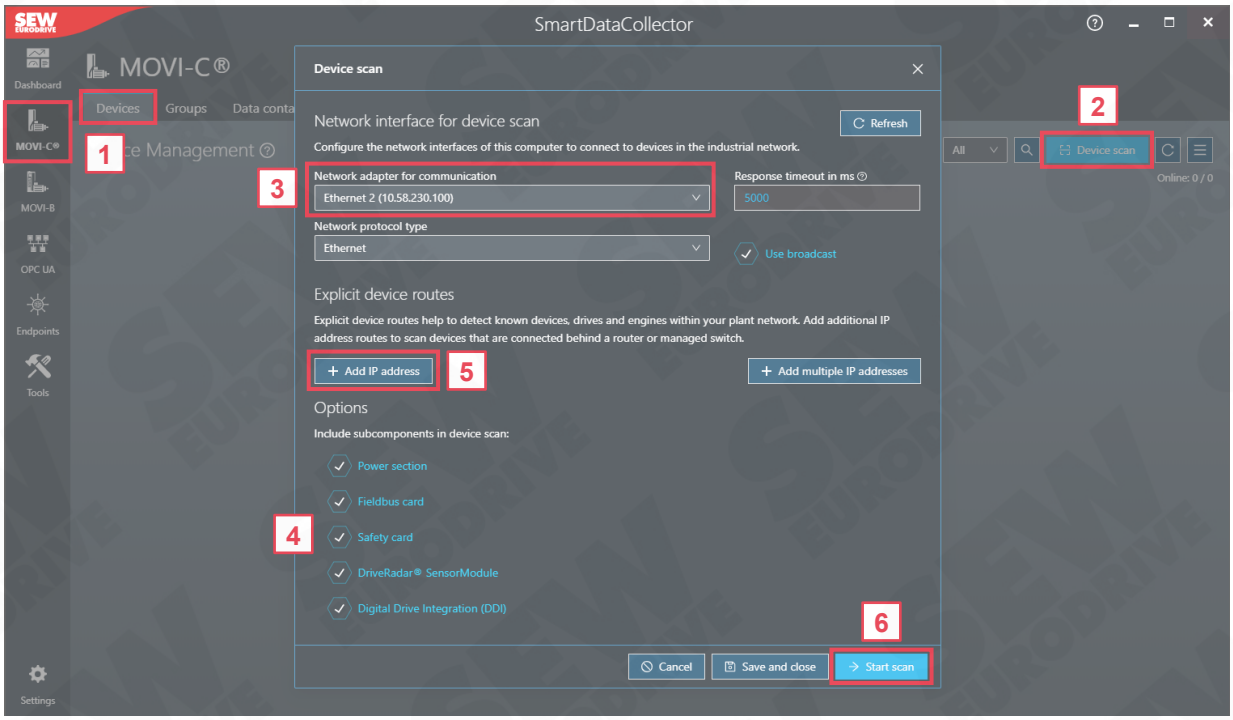
5.2 Perform a device scan

1. Configuring the device scan



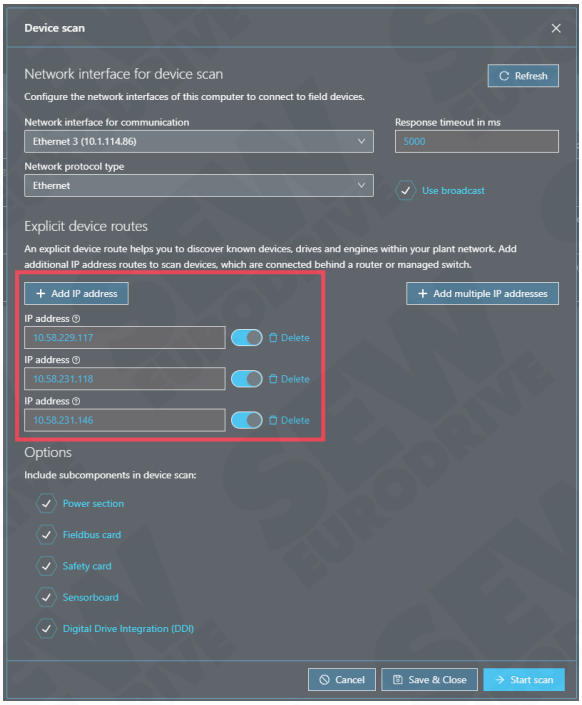
1 Open the **MOVI-C®** category of the **MOVI-B** and the **Devices** tab

2 Select **Device Scan**

3 Select the configured **network adapter** with the corresponding IP address (see Chapter 5.1)

4 The **subcomponents** can be deselected for the scan because they cannot be mapped in the IoT Suite

5 **Adding an IP address** and specifying the destination IP addresses can also be used to find devices in the system network that are located in the network behind a router or managed switch



6 Select **Start scan** to trigger the device scan

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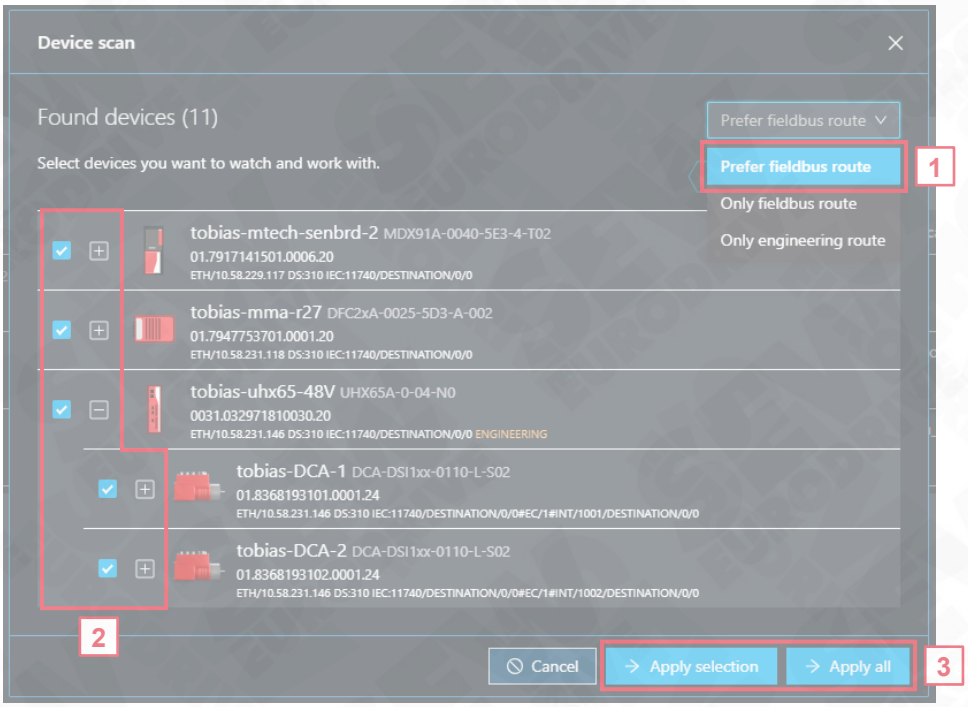
2. Device scan

All SEW devices found in the network are displayed behind the scanner.

3. Selection of devices found



1 With MOVI-C® controllers, you should always select **Prefer fieldbus route** because devices are automatically found here via the fieldbus and the engineering port

2 Select the devices found from the scan that are to be transferred to the DriveRadar® SmartDataCollector

3 Either accept the selection with **Apply selection** or **Apply all** found devices

The firewall settings in the network may differ for engineering and fieldbus route.

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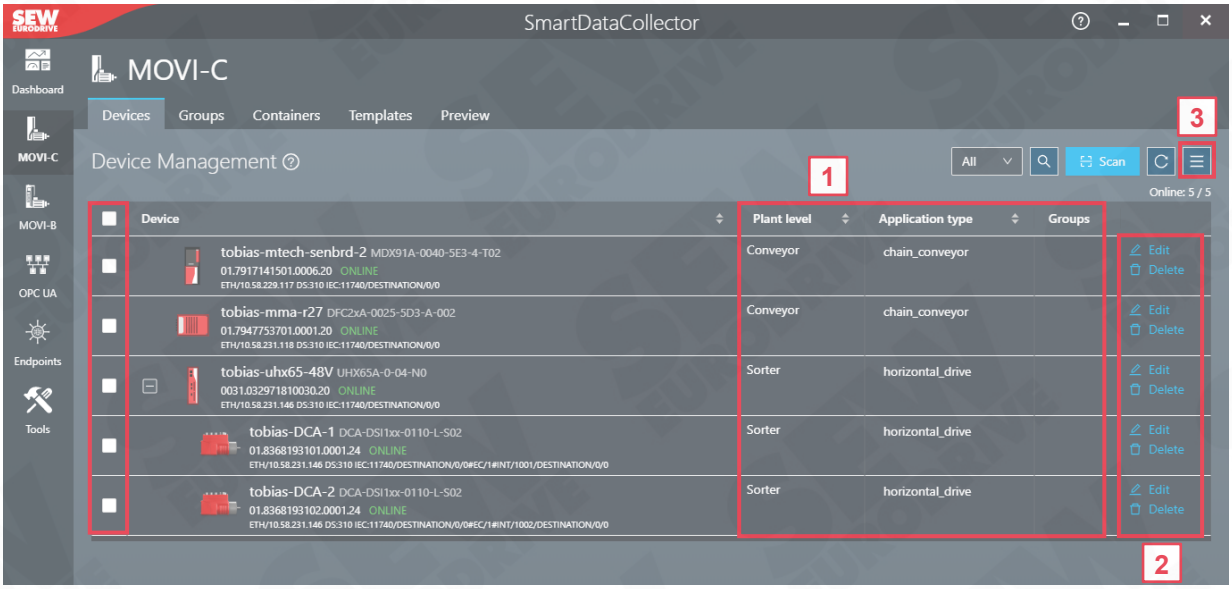
4. Device scan result

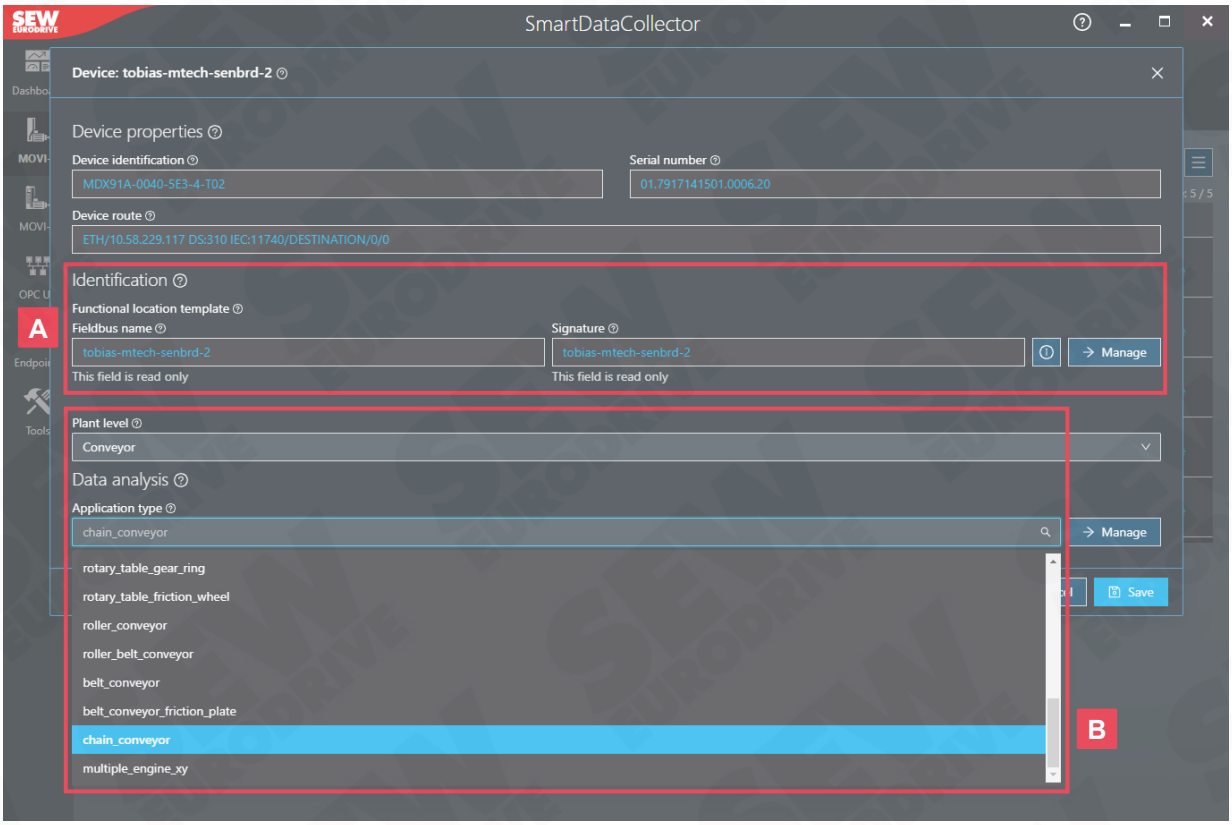


1 The assigned metadata for the **system level**, **application type** and **device group** are displayed here for evaluating the entered data in the IoT Suite. The automatic assignment to the standard device groups is not listed

2 The devices found in the scan can be **edited** or **deleted** here. Individual devices can be assigned to a system level and a device type here

3 You can also edit and delete multiple devices via the **burger menu** and **device selection**. Device groups can also be defined here

5. Edit devices



A **Functional location** is an important metadata for data analysis in the IoT Suite

B For data analysis in the IoT Suite, the devices can be assigned to suitable **application types**

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6 Creating and assigning metadata: Functional location, system level, and application type

Objectives

You will be able to

- understand the benefits of metadata
- create and assign functional locations
- create and assign system levels
- create and assign application types

6.1 Create system levels

Under the system level, each device can be located in the system hierarchy. The system levels can be found in the ***requirements specification for factory initialization*** from the customer acceptance process. However, the definition of system levels is optional.

1. View the system structure from the requirement specification

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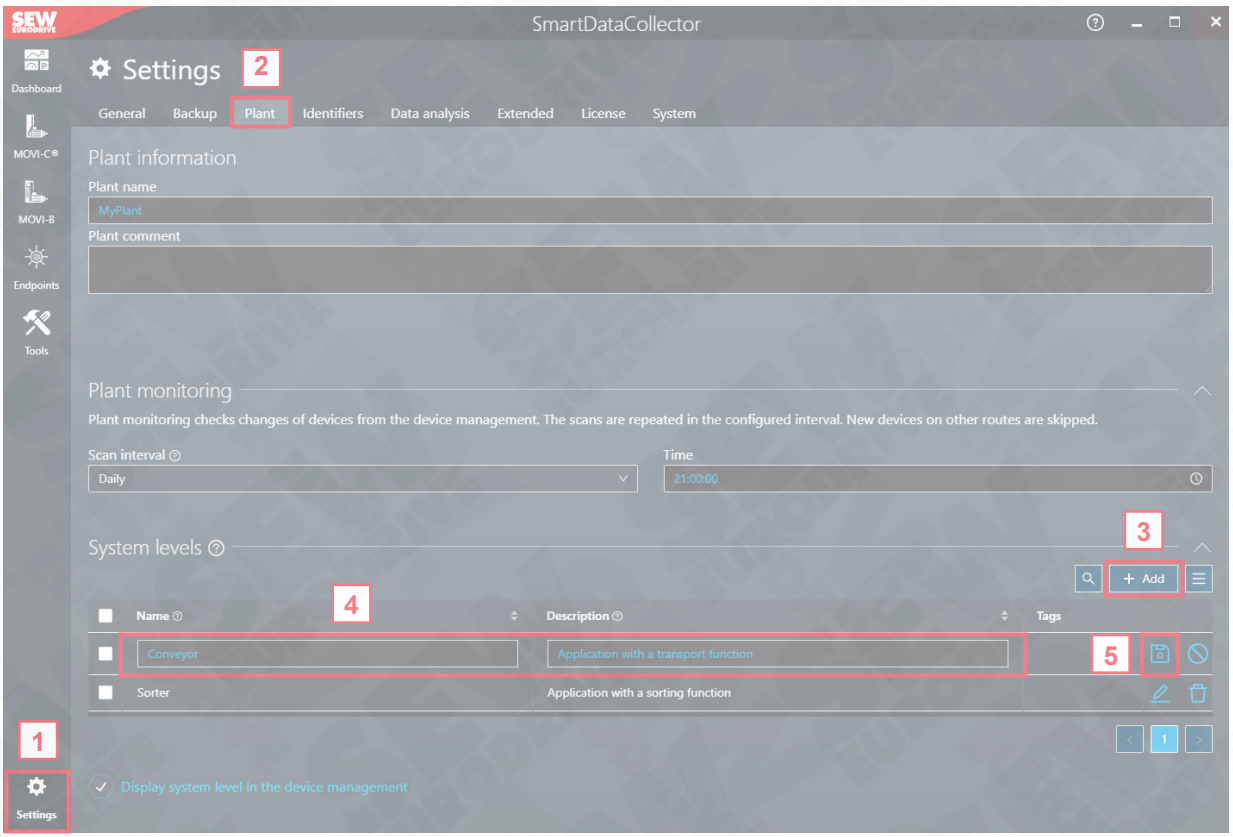
Requirements specification for factory initialization
DriveRadar® SmartDataCollector and IoT Suite for applications

System Name Level 5	System Name Level 4	System Name Level 3	System Name Level 2	System Name Level 1	notes
		Workbook Test setup			
		Workbook Test setup	Controller based		
		Workbook Test setup	Controller based	Sorter	
		Workbook Test setup	Direct profinet		
		Workbook Test setup	Direct profinet	Conveyor	

2. Creating the system levels



1 Open the **Settings** menu

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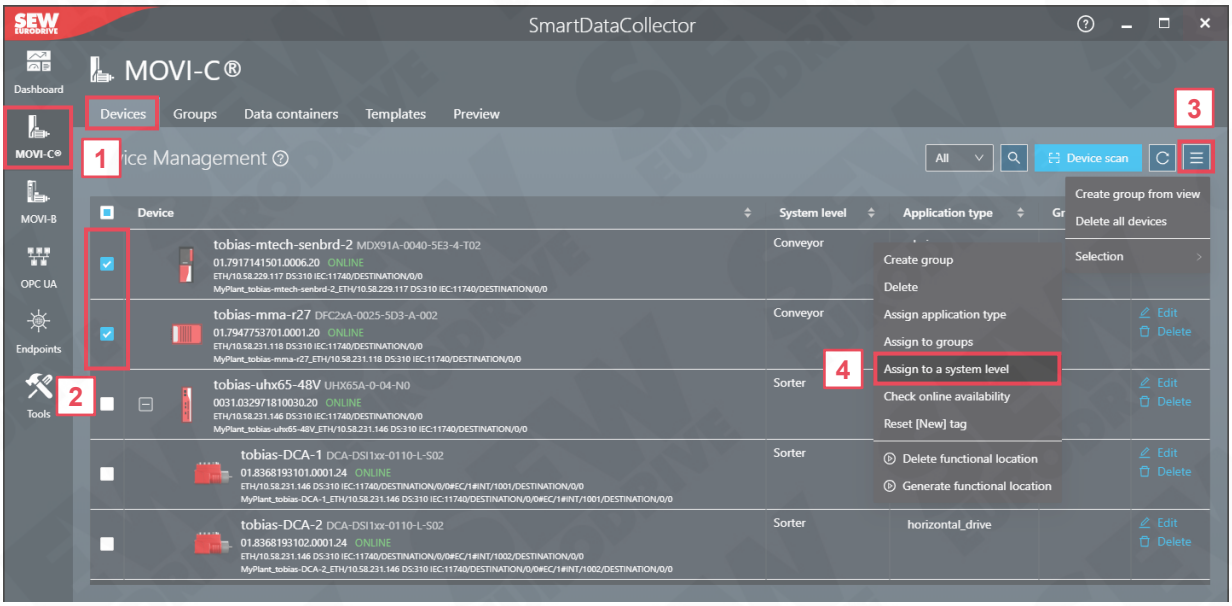
2 Open the **Plant** tab

3 In the **System levels** area, click **+ Add** → a new row is added to the list of system levels

4 In the new row, fill in the fields in the **Name** and **Description** columns

5 Click the **Save** button

3. Assigning the system levels to the devices



1 Open the **Devices** tab in the **MOVI-C®** or **MOVI-B** menu

2 Select the required devices from the **check boxes** in the list of devices

3 Open the **burger menu** with the functions for further processing

3 In the **Selection** submenu, select the **Assign to a system level** entry → the Application type dialog box is displayed in which the desired system level can be selected

As there is no *requirement specification for factory initialization* within the workbook, the **designations** can **either** be **adopted or redefined as required**.

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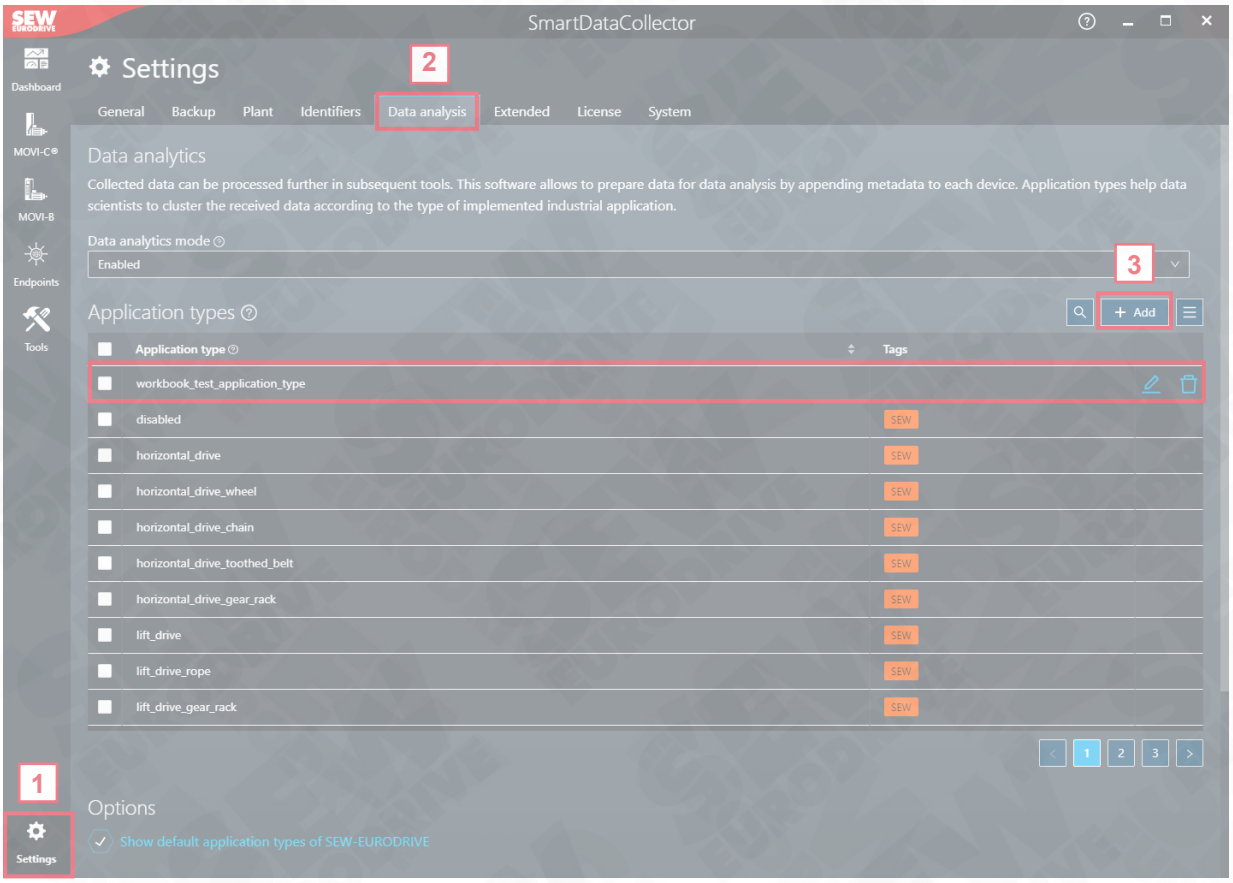
6.2 Create application types

This metadata is required to compare scope and parameter data in the IoT Suite. This information is essential to ensure comparability between the data (apples ≠ pears).

1. View preconfigured application types and create new application types



1 Open the **Settings** menu

2 Open the **Data analysis** tab

3 In addition to the application types marked with the **SEW** tag, you can add your own application types under **+ Add**

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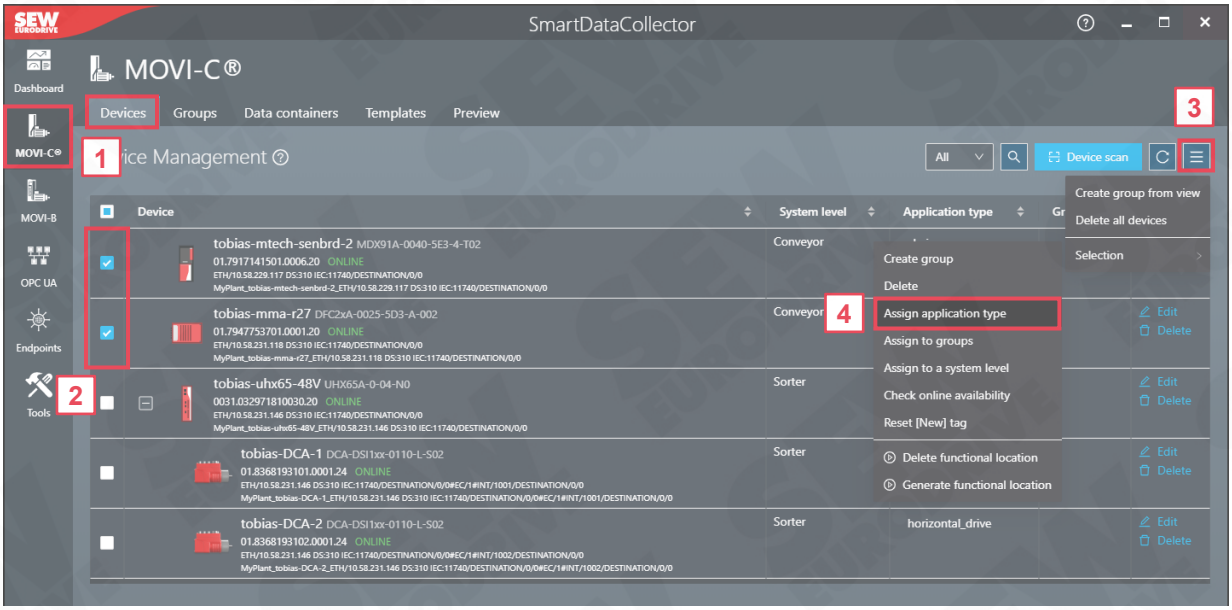
2. Assigning the application types to the devices



1. Open the **Devices** tab in the **MOVI-C®** or **MOVI-B** menu
2. Select the required devices from the **check boxes** in the list of devices
3. Open the **burger menu** with the functions for further processing
4. In the **Selection** submenu, select the **Assign application type** entry → the Application **type** dialog box is displayed in which the desired application type can be selected

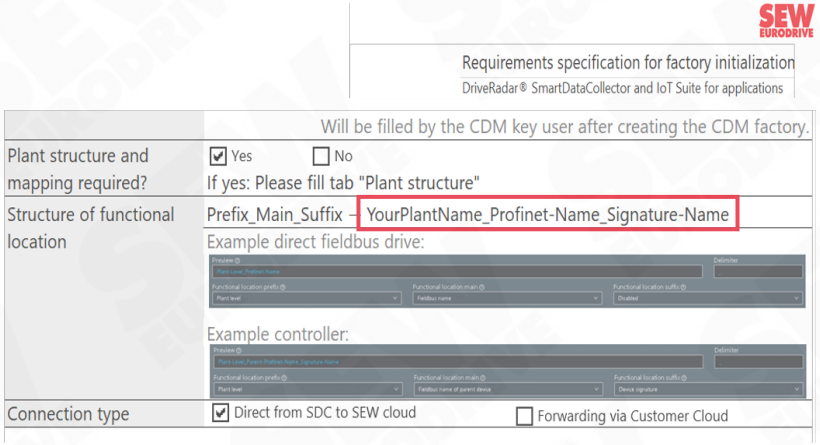
As there is no *requirement specification for factory initialization* within the workbook, the **designations can either be adopted or redefined as required**.

The assignment of the metadata system level and application type can also be made individually for all devices (see Chapter 5.2), but usually requires a higher configuration effort.

6.3 Create functional locations

In **IoT Suite mode**, the 'functional location' identifier must be assigned to the devices. The aim is a unique designation for each device in the system. The functional location also contains all the necessary data for the device so that a device replacement can be detected without data loss.

1. View the designation structure from the requirement specification



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2. Configure the functional location

2 Open the **Settings** menu

2 Open the **Identifiers** tab

3 In IoT Suite mode, the selection box for the **functional location mode** is grayed out and the designation can only be made using the naming logic listed below

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4 Configure the designation of the functional locations according to the requirement specification. The Configurator offers a wide variety of designation options to meet all customer requirements

5 Click **Assign the functional location metadata item to all devices**, to assign the designation scheme to all devices

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7 Creating device groups

Objectives

You will be able to

- use, create, and add device groups

Device groups are used to structure the devices in data acquisition, e.g. within a large plant. Grouping the devices, for example, by application type, device type or communication interface, is recommended especially with regard to data analysis.
By default, groups are already preconfigured that can be created automatically and cannot be deleted (e.g. NEW_DEVICE – all new or unused devices). Devices found during a device scan are automatically assigned to these groups.
The created groups can be selected as data source when configuring containers.

1. Add a new device group

1 Open the **MOVI-C®** category and the **Groups** tab

2 Click **+ Add** to create a new device group → the **Device Group** dialog box opens

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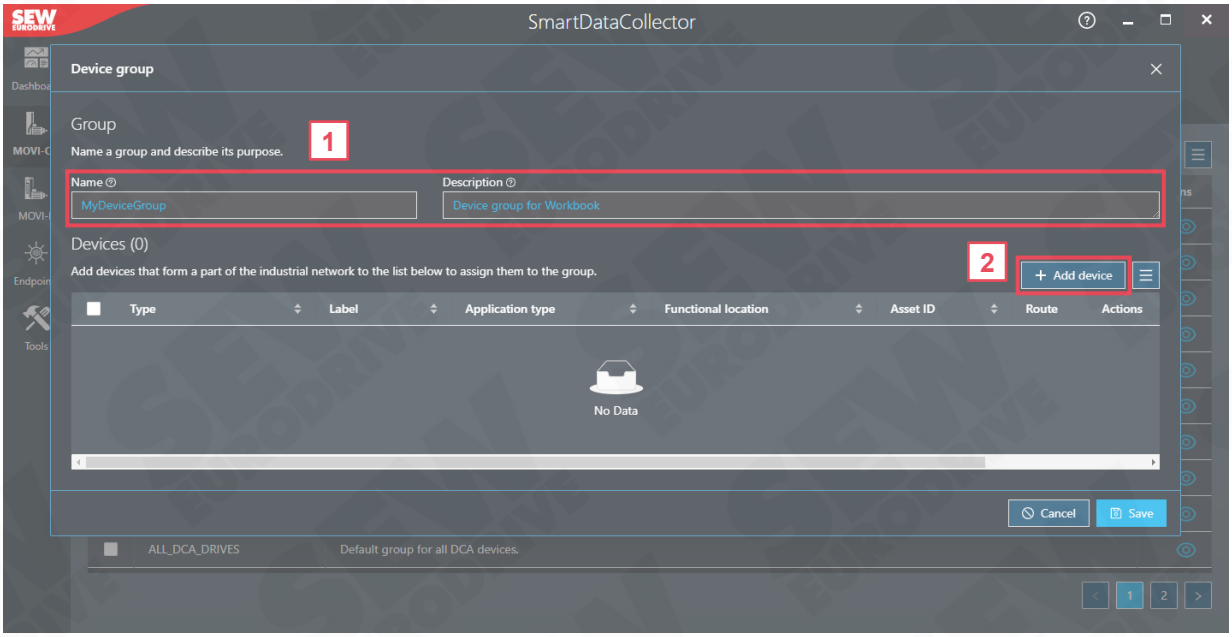
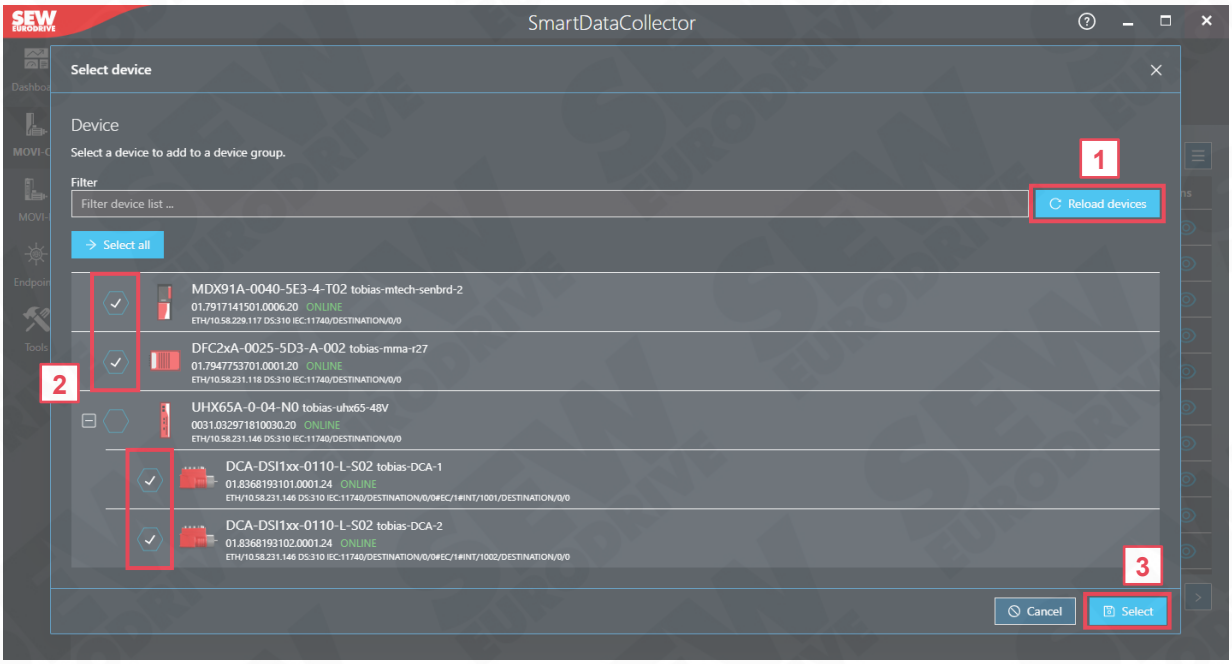
2. Create device group



1 Enter a **Name** and **Description** for your device group

2 In the **Devices** section, click **Add device** → the **Select device** dialog box opens and the devices found in the network are displayed

3. Assign the device to the device group



1 If not all the required devices are visible, select **Reload devices**

2 Select the devices for their device group

3 Click **Select** to complete the selection of the devices

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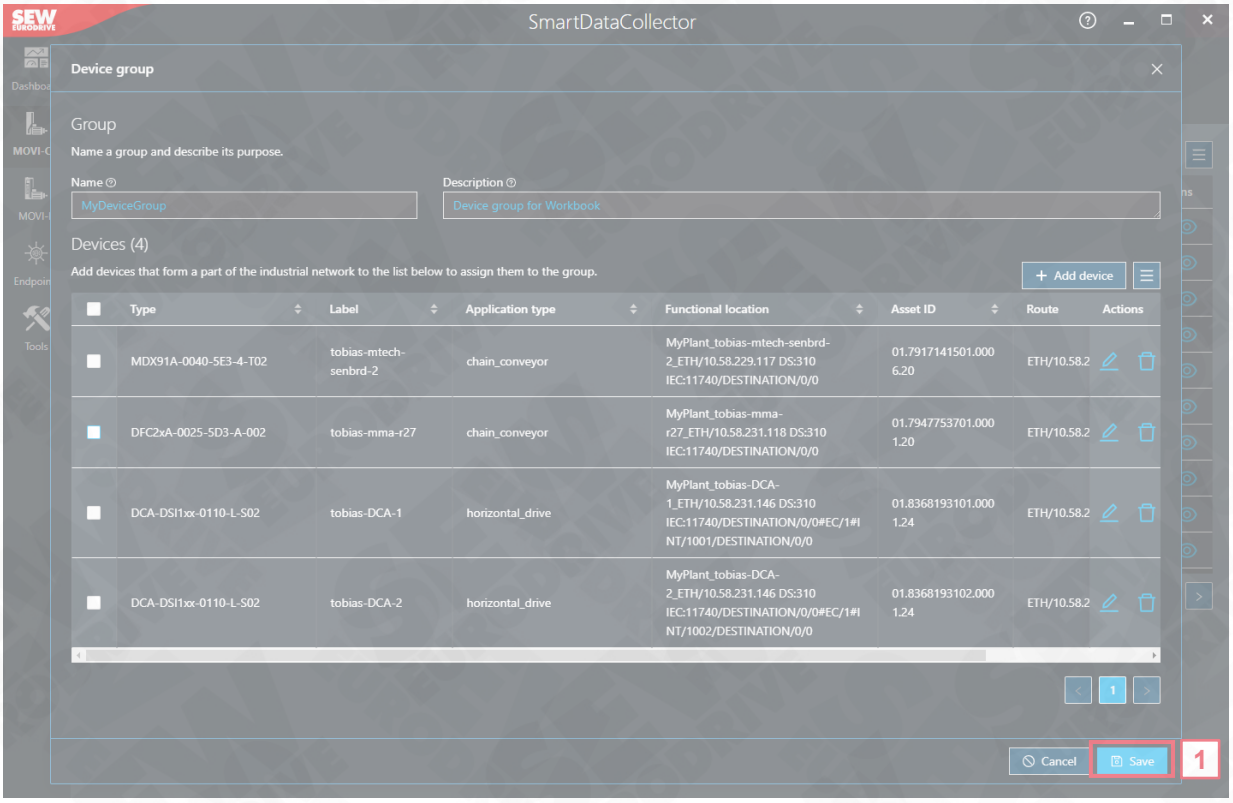
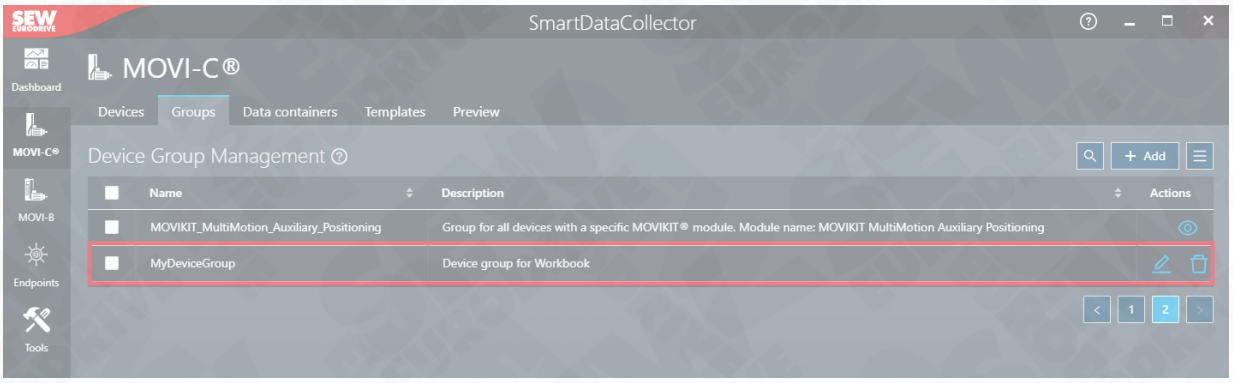
4. Save the device group



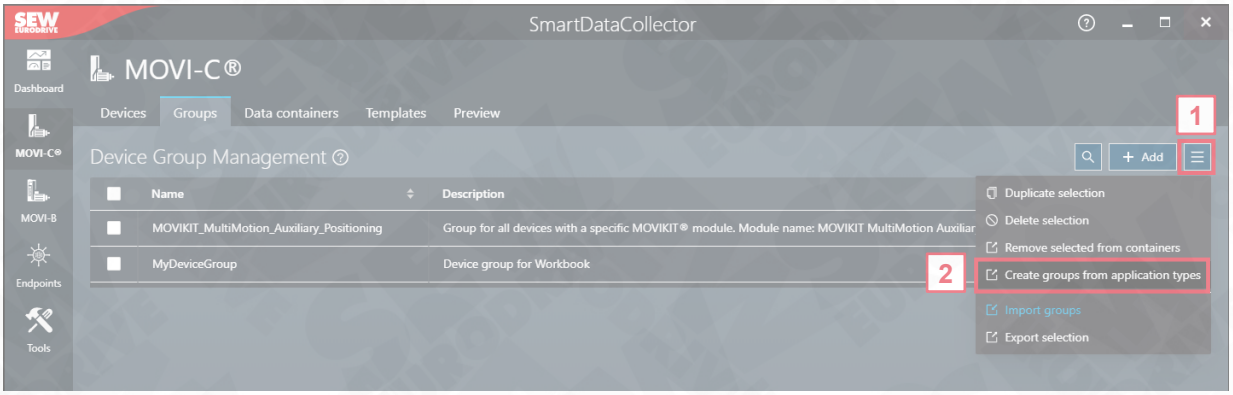
1 Click **Save**

5. Device group result



In most cases, it makes sense to create device groups from the defined application types. To save on manual configuration work, a shortcut is provided for this application.

1. Create device group based on application type



1 Open the **burger menu** with the functions for further processing

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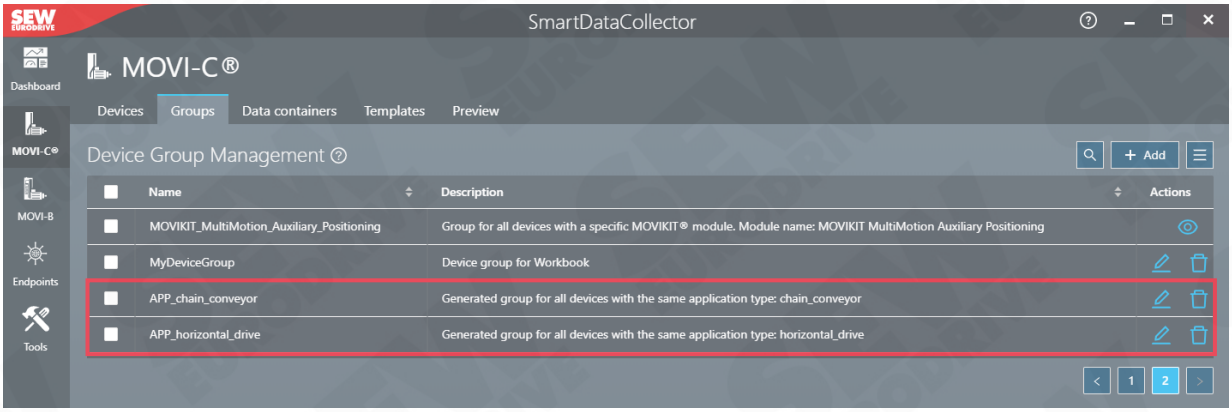
2 Click the entry **Create groups from application types** → the assigned devices are created for the existing application groups and displayed in the list in the **Groups** tab

2. Device group result



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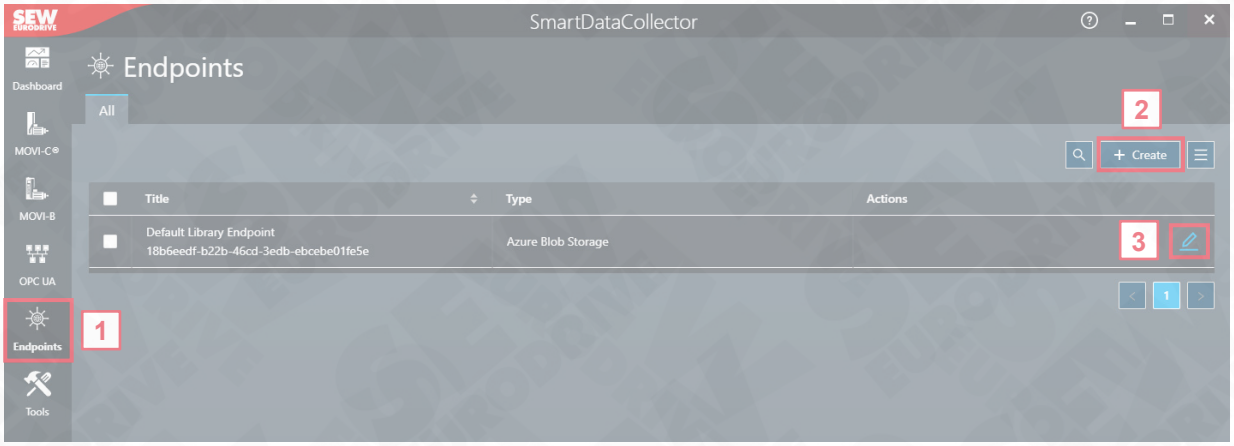
8 Creating endpoints

Objectives

You will be able to

- create endpoints in both stand-alone and IoT Suite mode

1. Add a new endpoint

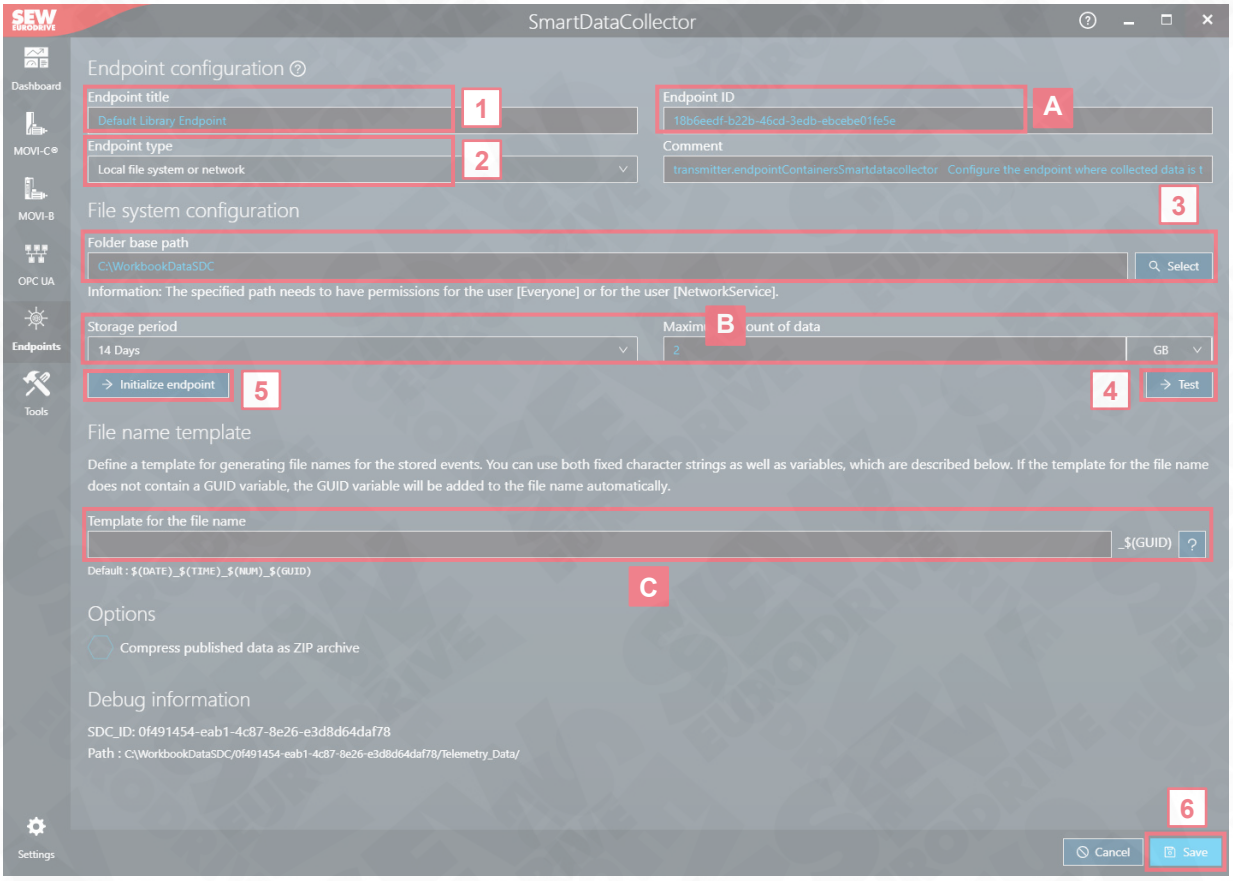


1 Open the **Endpoints** category

2 A new endpoint can be created under **+ Create**

3 Alternatively, click **Edit** to configure the default endpoint. The advantage of using this endpoint is that the standard containers are already linked to it

2. Configure the local endpoint



1 Since the **default library endpoint** is edited, the title cannot be edited. Otherwise, the **endpoint title** is assigned here

A An **Endpoint ID** is automatically assigned to each endpoint

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2 Configure the endpoint type to **Local file system or network**

3 Under **Select**, enter a local folder path

B To avoid too much data at the endpoint, a maximum storage time and data size are defined, which can be adjusted as required. If the maximum data size is exceeded, the oldest data sets are automatically deleted

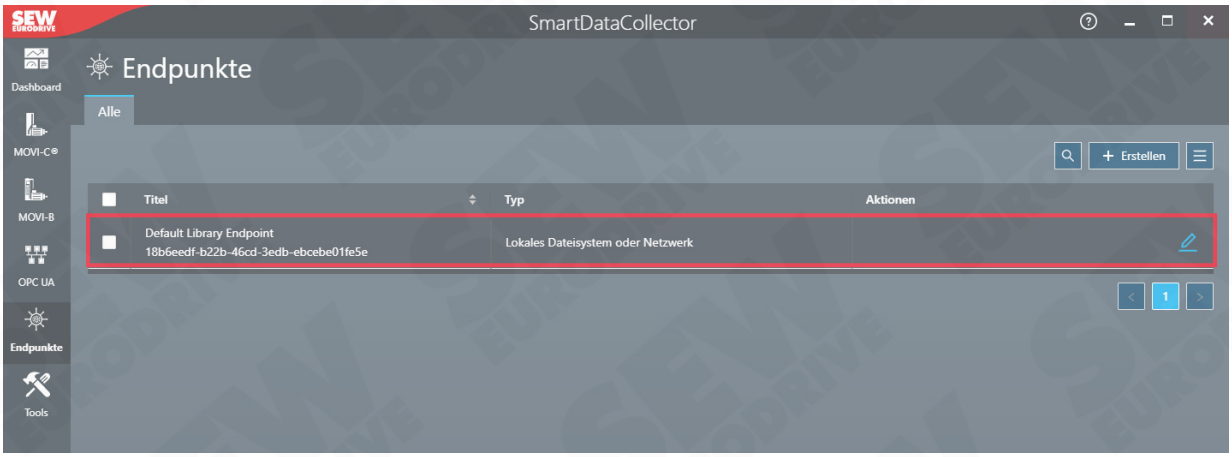
4 **Test** access to the endpoint → successful access is displayed with a message. A folder with a test file is also created at the storage location

5 **Initialize** the endpoint → all required directories are created in the endpoint

C As an alternative to the plant template, the file names can be generated according to your own template. The available variables are displayed by clicking the **?**

6 Finish the configuration of the endpoint with **Save**

3. Result of local endpoint



In addition to the local endpoint, the data can also be sent to an HTTP(S) endpoint, an InfluxDB database, or an Azure Blob Storage. The latter endpoint is required for **IoT Suite mode**.

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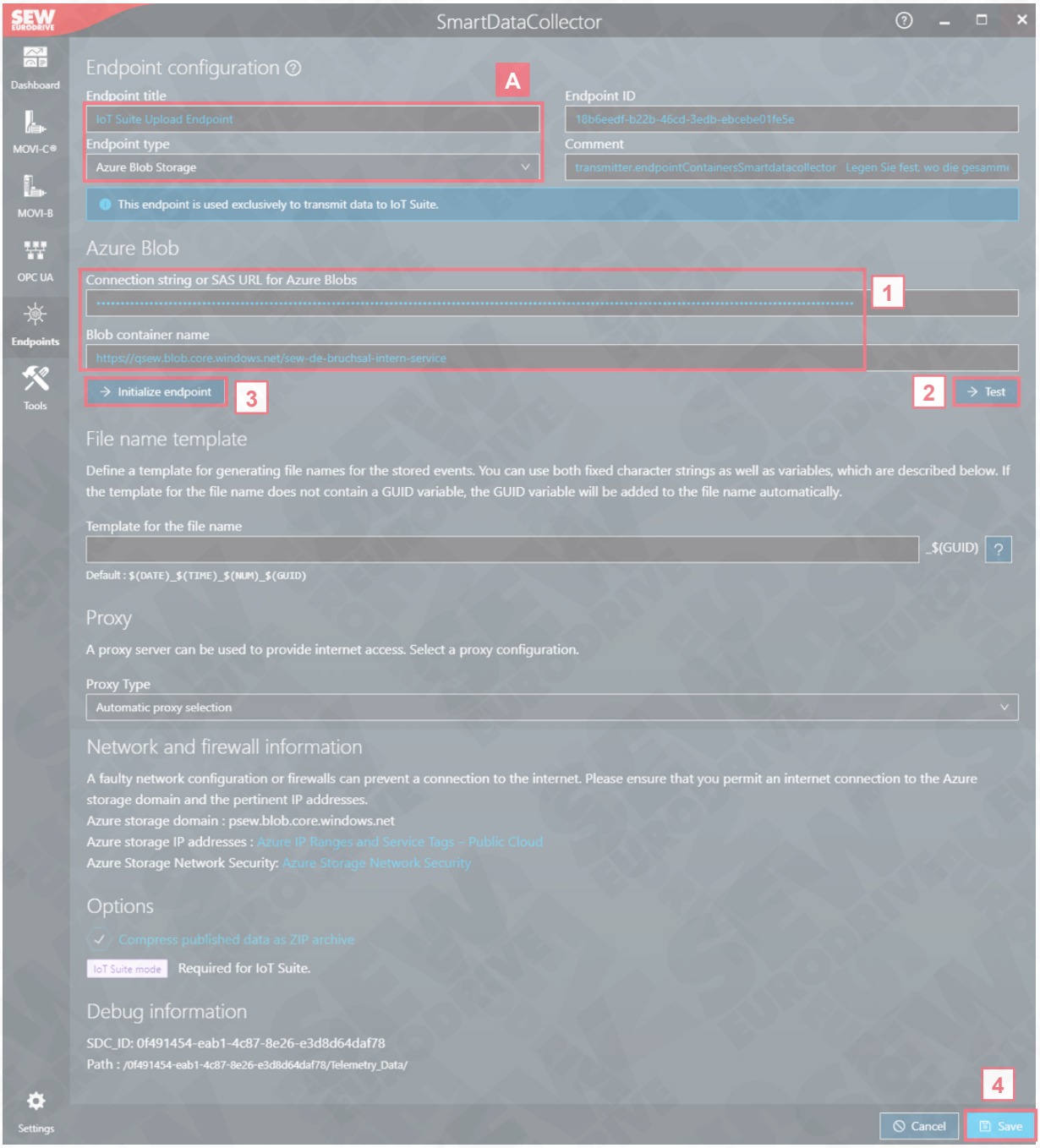
1. Endpoint in IoT Suite mode



A In IoT Suite mode, the name of the preset endpoint changes to **IoT Suite Upload Endpoint**. However, the **Endpoint ID** remains unchanged

1 Specify the string containing the Azure blob address and authentication information. For reasons of IT security, it is generally recommended to use a **SAS URL**. Once entered, the **Blob container name** is filled in automatically

2 **Test** whether access to the selected storage destination is possible

3 Use **Initialize endpoint** to create all required directories in the endpoint

4 Click the **Save** button

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9 Creating and using parameter containers

Objectives You will be able to

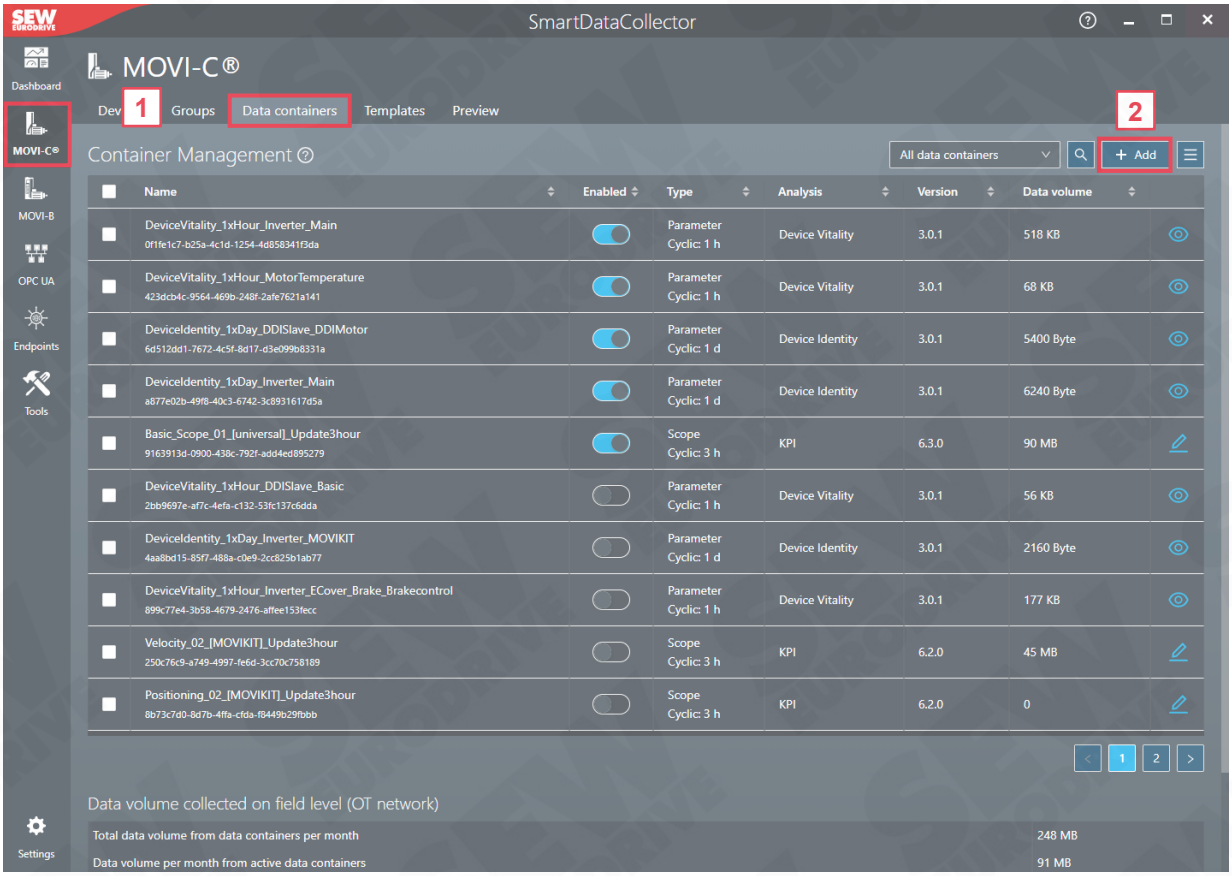
- use, create, and add parameter containers

A data container is a default setting that contains a list of device data. In the container, the device data of interest is linked to specific devices and sent to a specific endpoint.

There are 2 different types of data containers: The parameter container and the scope container. The former collects device parameters – usually in the form of actual values or KPIs (key performance indicators). The scope container, on the other hand, records the parameters over a defined time range (→ time signal).

9.1 Creating parameter containers

1. Add a new container



1 Open the **MOVI-C®** or **MOVI-B** category and select the **Data containers** tab

2 Click **+ Add to** create a new container

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2. Configure containers

1. Enter a **Name** for the container
2. Select the **Parameter** container type and the **cyclic** update strategy. By activating the **Enable data container** option, the data container is automatically activated after the configuration is completed
3. Assign your desired **device group** to the parameter container
4. Check the **box** to transfer data events to the endpoint. Select your previously configured endpoint for saving the data events
5. In the parameter area, add the **DC link voltage 8364.160** parameter with **+ Add one**

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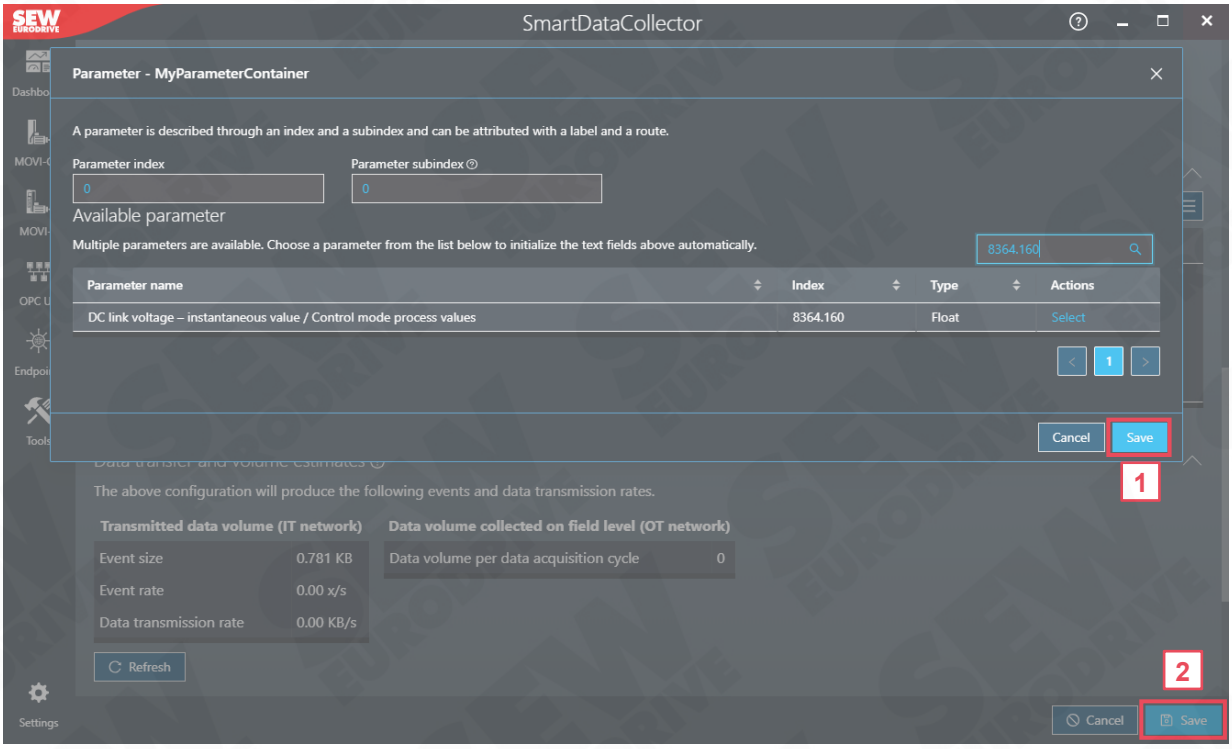
3. Adding a parameter to a container

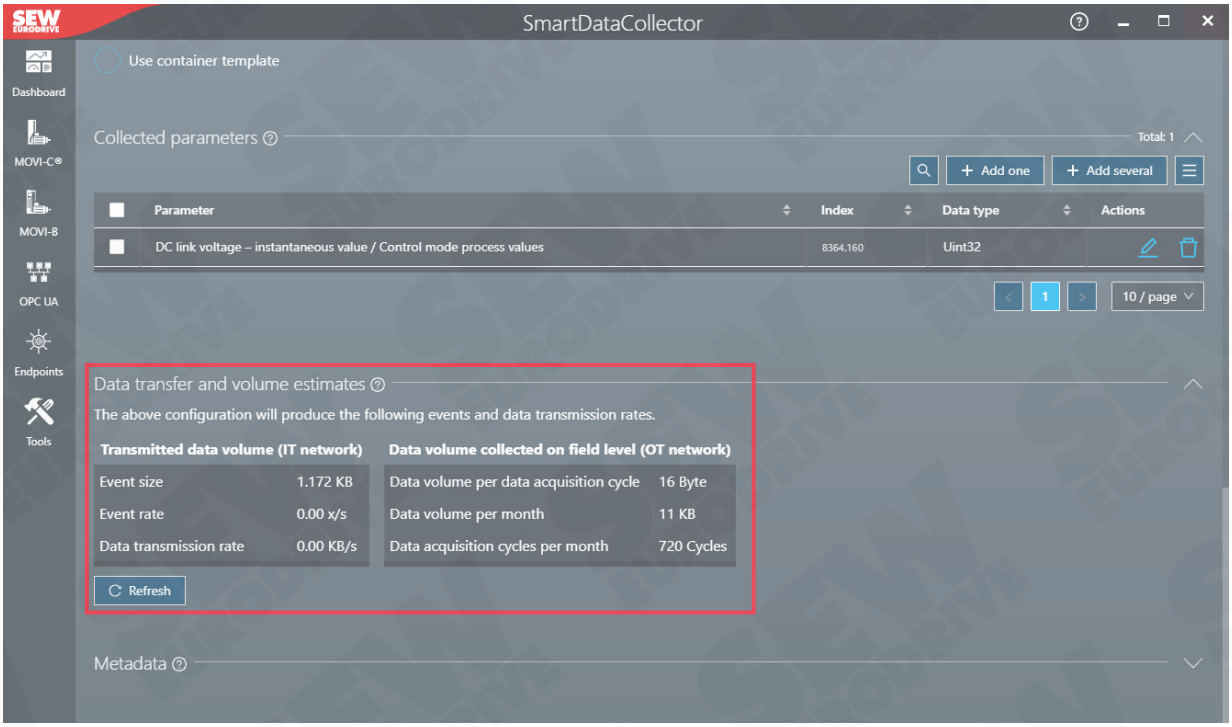


1 **Save** the selected parameters

2 **Save** the configuration of the parameter container

To estimate the data load of the created parameter container, there is a solution in the configuration of the corresponding container.

4. Estimation of data volume parameter container



Note: The data volume may differ for the models in training, depending on the number of inverters on the model or in the device group.

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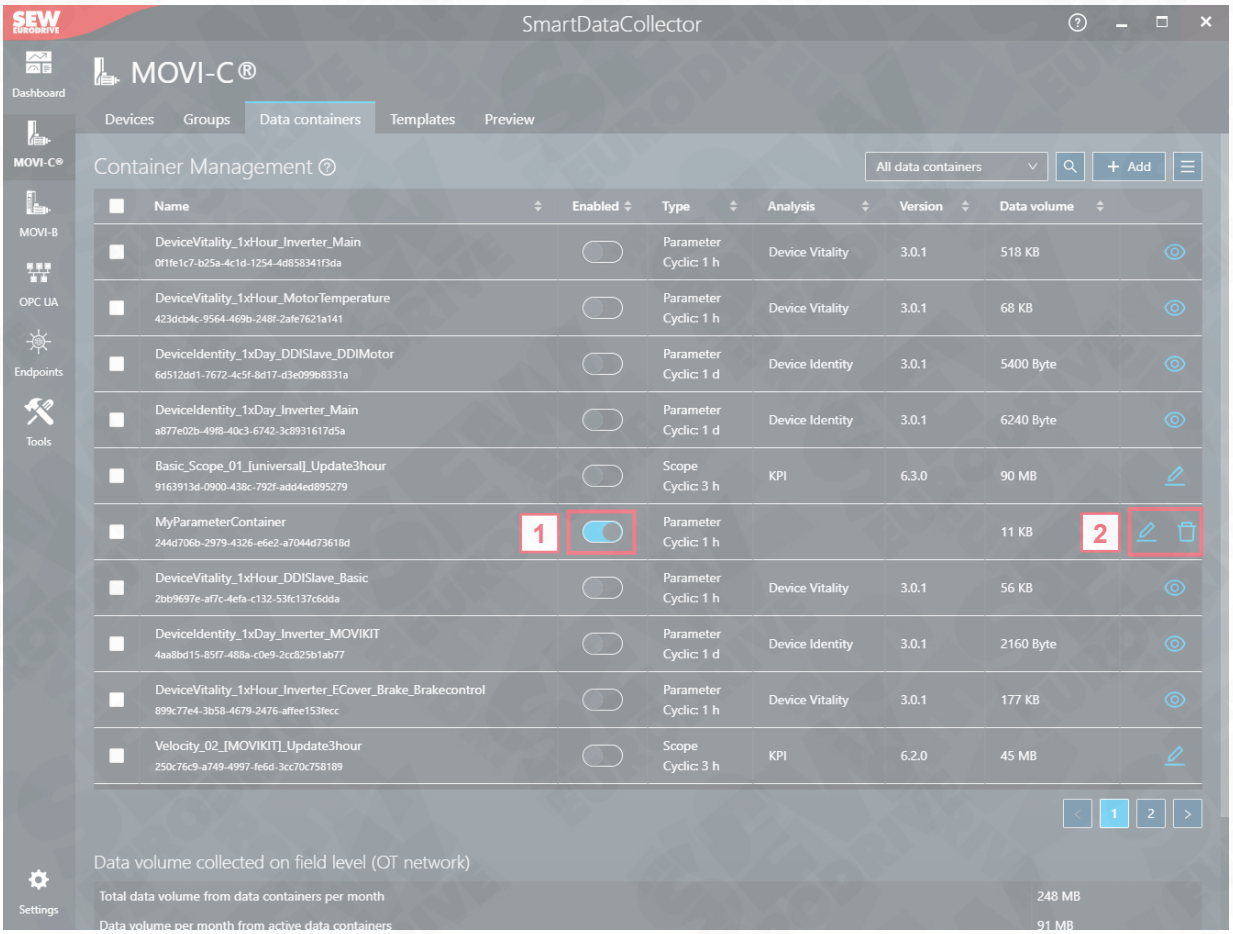
9.2 Use of parameter containers

1. Activate the parameter container



1 Activate your created container with the **slider**

2 To add additional parameters or change settings, select the **Edit** icon. If the container is no longer required, it can be removed via the **delete** icon

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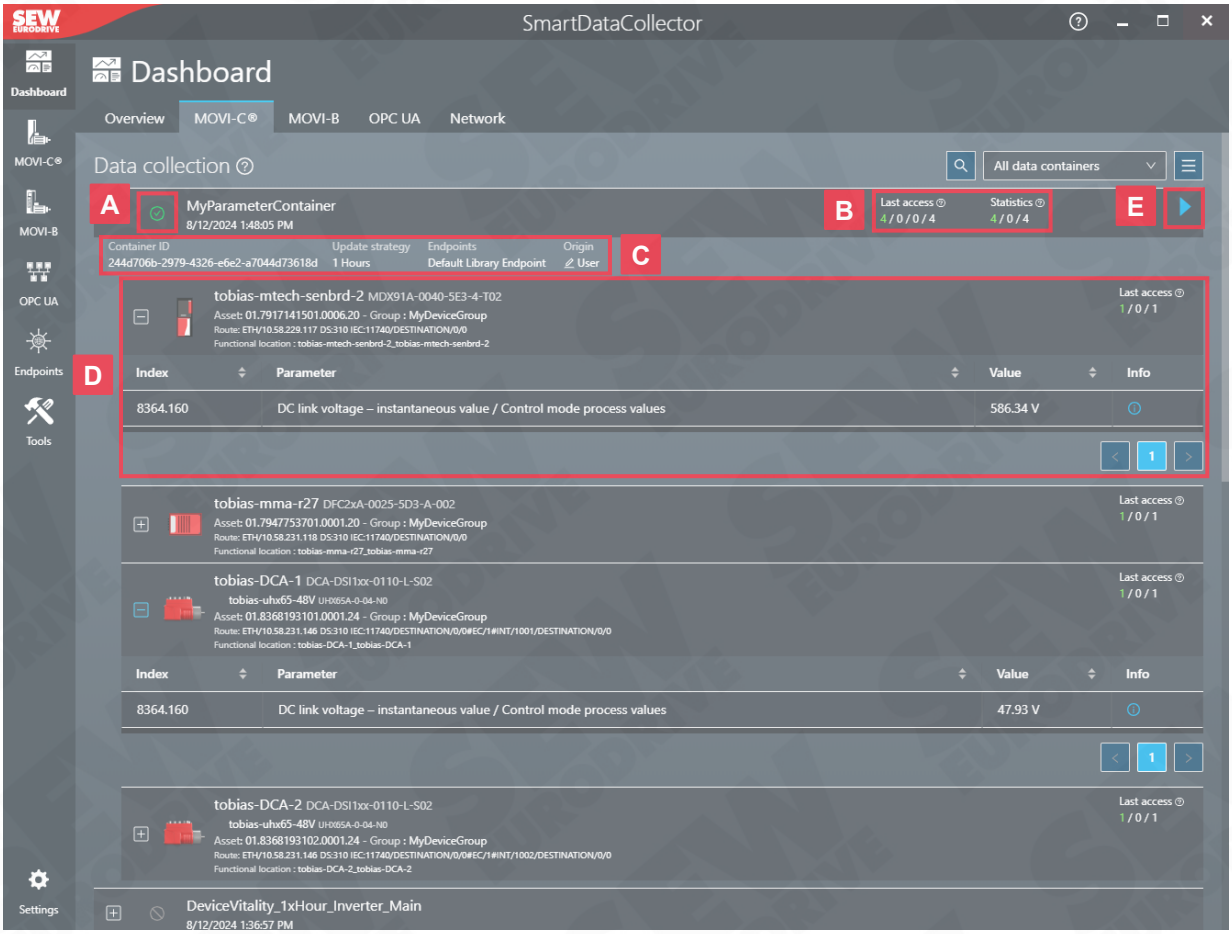
2. Result of data collection in the dashboard



A The status of the data collection is indicated by the green **check symbol** as active

B The status bar shows the following:

Last access: 4/0/0/4 – Statistical values for the last read access

Number of devices that:

have been read successfully / that have not been read completely / that were offline or not reachable / that are assigned to the container

Statistics: 4/0/4 – Statistical values since the last start of the container

Number of devices that:

have been read successfully or partially successfully / offline or not reachable / have been assigned to the container

C In addition, the **container ID, the update strategy** and the assigned **endpoints** are displayed

D By pressing the **plus symbol** in front of the respective device, the collected data can be checked directly

E Data acquisition can be triggered manually via the **start icon**

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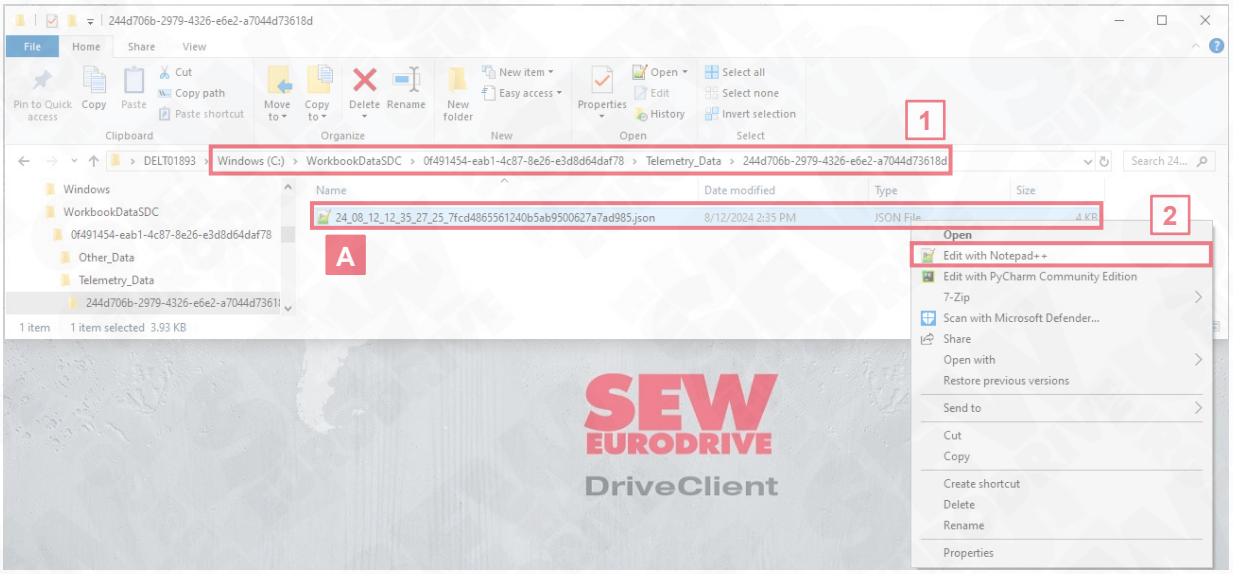
3. Result of data collection at the endpoint

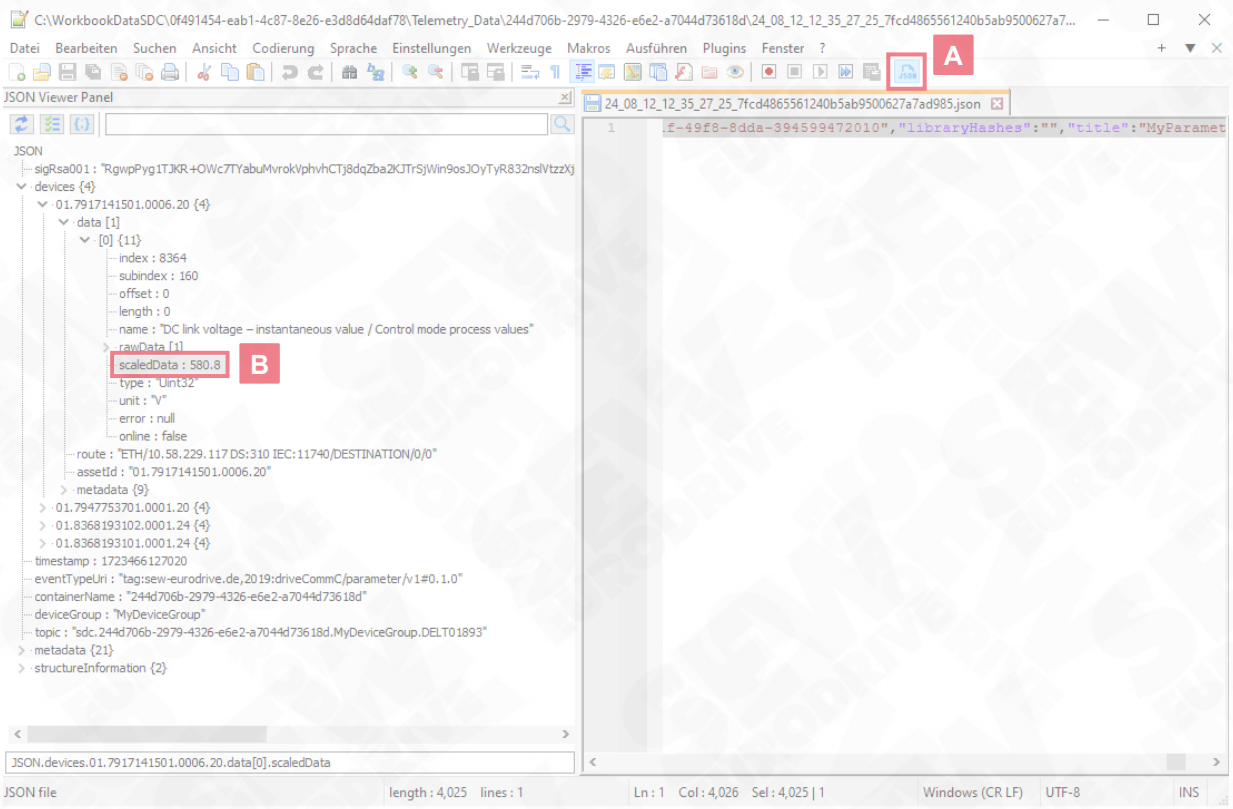


1 Navigate to the endpoint in the **file system** → here C:\WorkbookDataSDC\xxx\Telemetry_Data\xxx

A The collected data is available at the endpoint in **JSON format**. To read this format, the program **Notepad++** with installed JSON interpreters can be used, for example

2 Right-click the file and select **Edit with Notepad++**

4. JSON file in Notepad++



A An installed **JSON interpreter** makes viewing easier

C Numerical value of the configured parameter for a device in the data container

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5. Creating and testing additional parameters

- Add additional parameters to your own container:

Parameter name	Parameter index
Heat sink temperature	8312.5
Actual speed	8364.47
Fault code / fault memory	8341.1
(++)	(++)

- Select a parameter from MOVISUITE® and add it
- Compare the display formats of the DriveRadar® SmartDataCollector with the display of the parameters in MOVISUITE®
- Compare the data volume generated by the extended parameter container

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10 Standard container with example based on Device Identity

Objectives

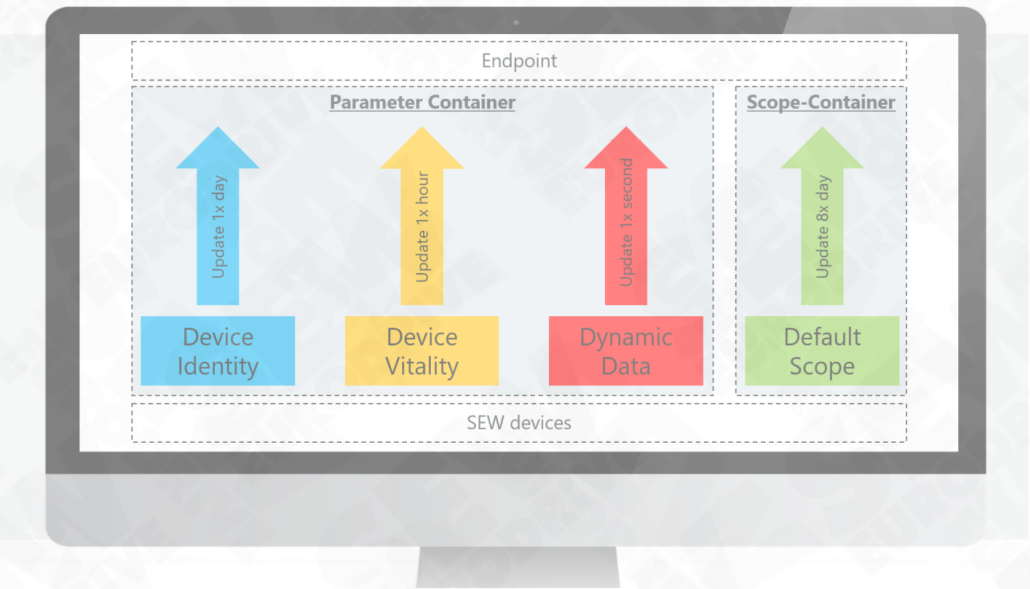
You will be able to

- understand the benefits of standard containers
- distinguish standard containers by Device Identity, Device Vitality, and Basic Scope
- work with standard containers

The DriveRadar® SmartDataCollector offers the option of installing libraries (cf. Chapter 2.1 and 2.2). The **DriveRadar® SmartDataCollector General Library** provides preconfigured containers and container templates (hereinafter referred to as 'standard containers') for certain use cases. The corresponding parameters or recording channels, the appropriate update interval, the relevant device groups and endpoints are configured in these standard containers. After installing the library, the standard containers can be used directly in the software without additional configuration work. If necessary, further adjustment of the containers in the software is also possible.

Subdivision of the standard containers into 3 categories

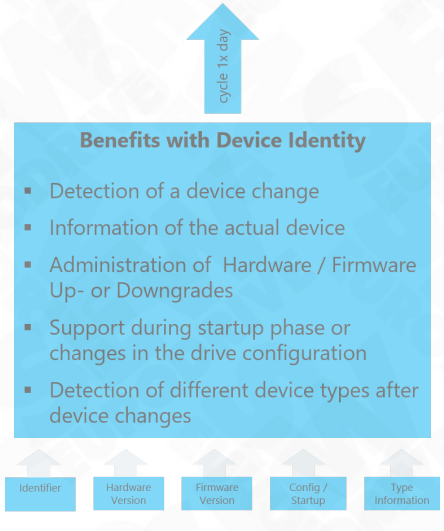
1) Device Identity
2) Device Vitality
3) Dynamic Data (only in stand-alone mode)
4) Default Scope



Standard containers with comparable functions are available for MOVI-C® and MOVI-C® predecessor devices.

Device Identity – 'Who are you?'

Standard container for collecting basic identity and property data of devices for asset management systems and digital twins. By recording parameter data such as serial number or firmware and hardware version, all SEW devices in a machine can be identified. Deviations from the version or device type are detected reliably and quickly thanks to the comparability of the recorded data. Since the data is relatively constant, the update interval is 1 times daily.



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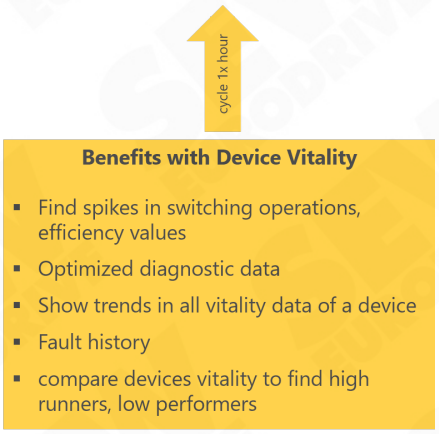
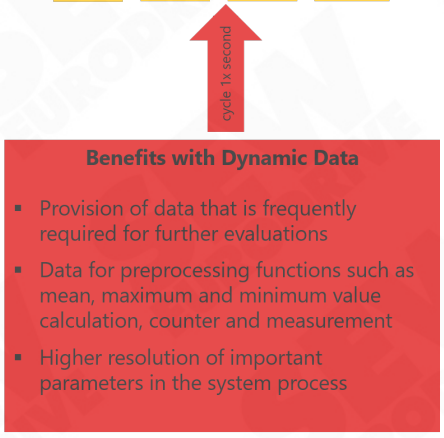
Device Vitality – 'How are you?'

Standard container for collecting parameter data for long-term monitoring and status analysis of devices. The standard containers read statistical values, lifetime and activity data, messages from the fault memory, and diagnostic data. Due to the comparability of the recorded data, peaks and trends can be derived from the vitality data of the devices and thus high-runner or low-performer. To ensure reliable monitoring, the update interval is one hour.



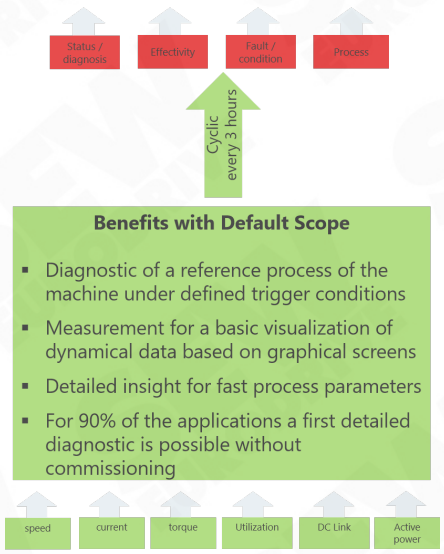
Dynamic Data – 'Show me trends'

Standard container for collecting frequently required parameter data. For example, the data can be provided for further evaluations and generate a higher-quality information content using preprocessing functions such as calculating mean, maximum or minimum values. In addition, the higher resolution of important parameters in the system process enables meaningful trends to be determined that lead to more precise analysis and ultimately condition monitoring.



Default Scope – 'Show me details'

Standard container for performing scope recordings for detailed diagnostics of almost all types of applications. The standard containers provide a simple and fast solution for generating scope recordings of all devices in the network. The predefined recording channels provide a comprehensive overview of effects that occur during recording in the application. This can be used to diagnose, for example, mechanical problems in the application, the quality of inverter startup, torque and current peaks in motion, and the quality of the DC current. The standard containers can be used, for example, to perform oftrigger conditions or to create a measurement for the basic visualization of Dynamic Data.



Note: For all current information on the standard containers, refer to the *DriveRadar® SmartDataCollector General Library – Standard Container for DriveRadar® Solutions* manual

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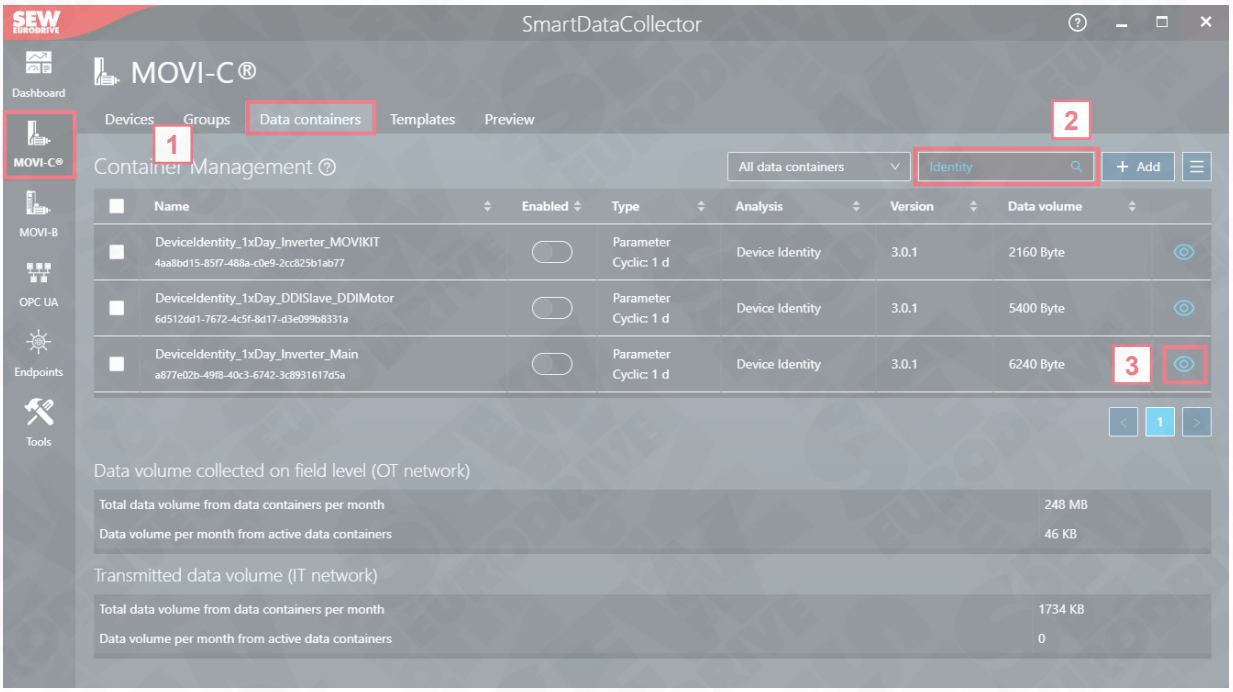
10.1 Practical example: Device Identity container

1. Filter containers



1 Open the **MOVI-C®** or **MOVI-B** category and select the **Data containers** tab

2 Filter the containers by **Identity** to see only standard containers of the Device Identity category

3 The **eye symbol** indicates the restricted use of the container (read access only). Clicking the icon opens the configuration of the standard container

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2. Container DeviceIdentity_1xDay_Inverter_Main

A All settings of the container are write-protected and can only be read. To make changes, it is possible to duplicate the container and modify the copy

B The 'DeviceIdentity_1xDay_Inverter_Main' container is a parameter container that is read cyclically once a day

C The container is assigned to the device group **ALL_DRIVES**

D The container is linked to the preconfigured **Default Library Endpoint**

E The properties of the listed **container templates** are inherited from the standard container. If a template is changed, the properties of the associated containers are also adjusted

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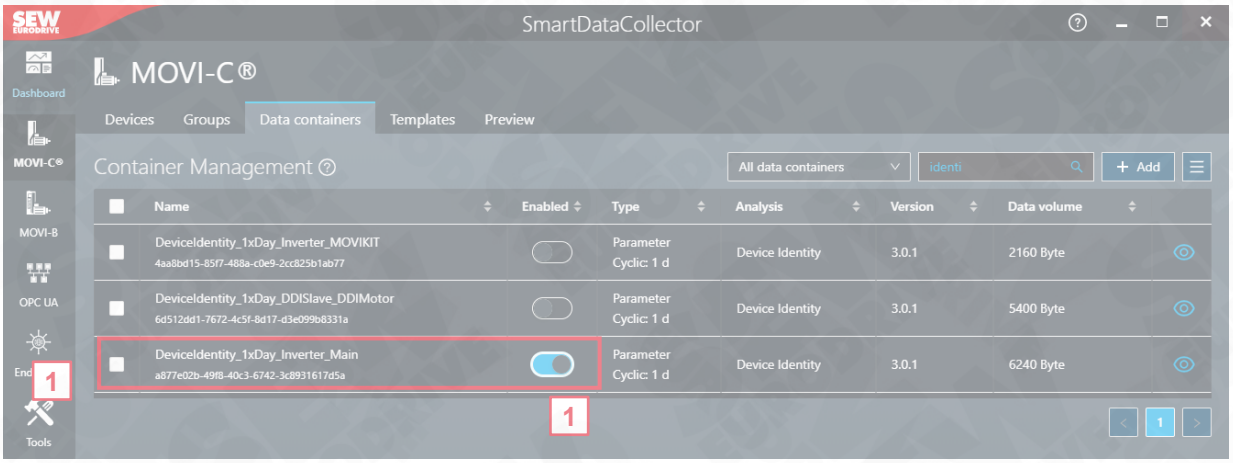
F The standard container contains parameters that are used to identify devices:

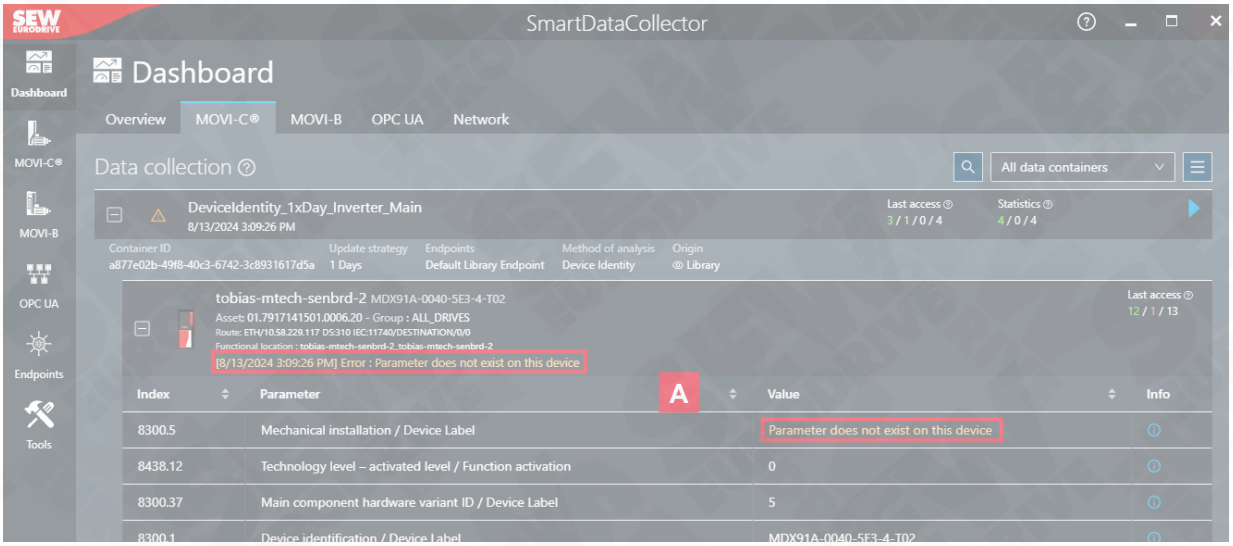
- Serial number / production data
- Device designation / customer label
- PROFINET device name / fieldbus
- Mechanical mounting / device label
- Main component hardware variant ID / device label
- Main component firmware 1 – version / device label
- Main component firmware 1 – release / device label
- Application level – activation key / function activation
- Application level – activated level / function activation
- Technology level – activated level / function activation
- Hash value device parameter set / parameter setup
- Device family / device label
- Device identification / device label

3. Activate container



1 Activate the 'DeviceIdentity_1xDay_Inverter_Main' container with the **slider**

4. Entered data in the dashboard



A If not all parameters of the container are applicable/available, a corresponding message appears

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11 Creating and using scope containers

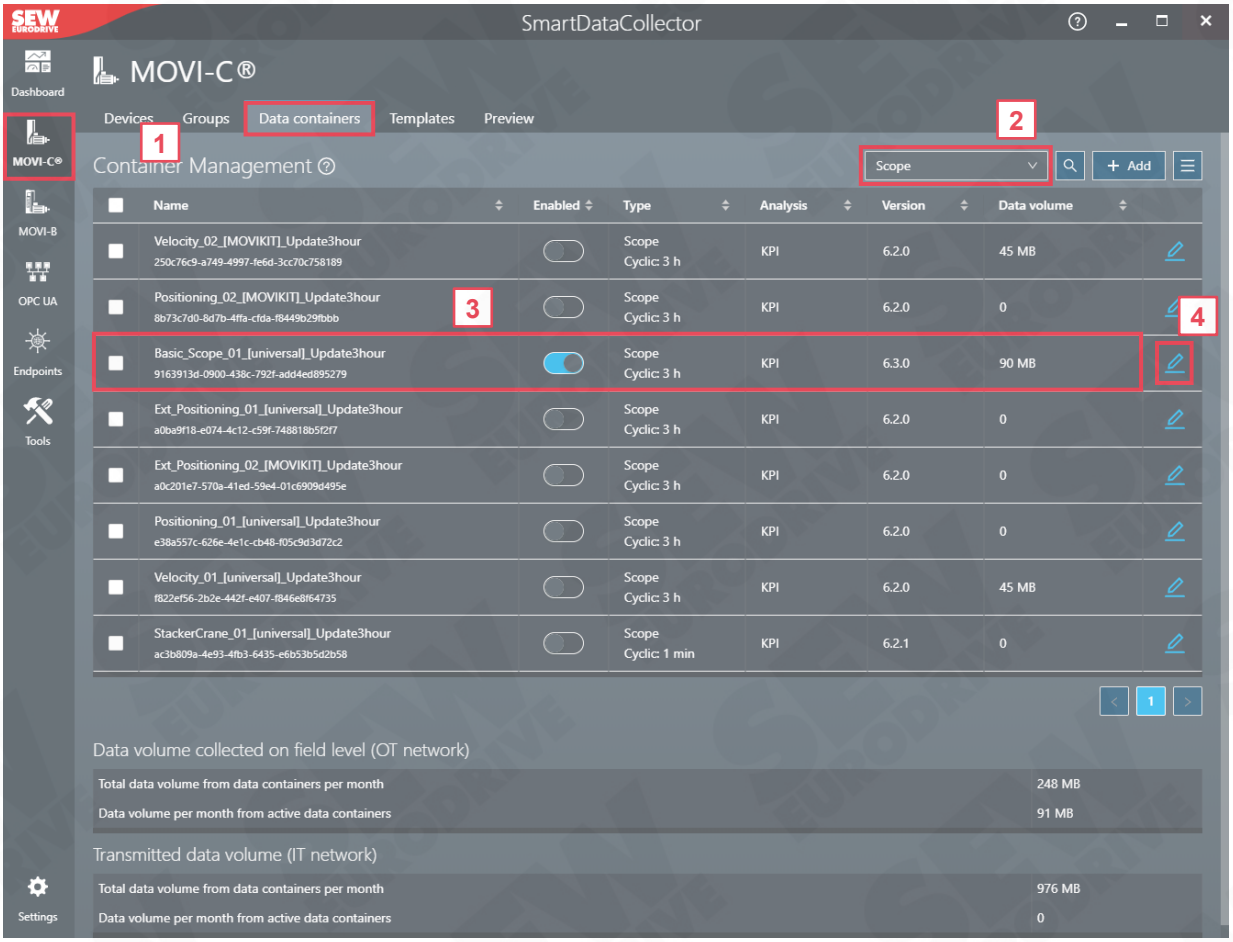
Objectives You will be able to

- use, create, and add scope containers

11.1 Use of standard containers

As with the parameter containers, there are also prefabricated containers for the scopes for fast and uncomplicated data generation.

1. Activate scope container



1. Open the **MOVI-C®** or **MOVI-B** category and select the **Data containers** tab
2. Filter the containers by the ‘Scope’ category
3. Activate the **Basic_Scope_01_[universal]_Update3hour** container
4. Click **Edit** to view and edit the exact configuration of the scope container

Unlike the standard containers for parameters, the containers for scopes are **editable** and do not have to be duplicated before they can be configured according to your own requirements.

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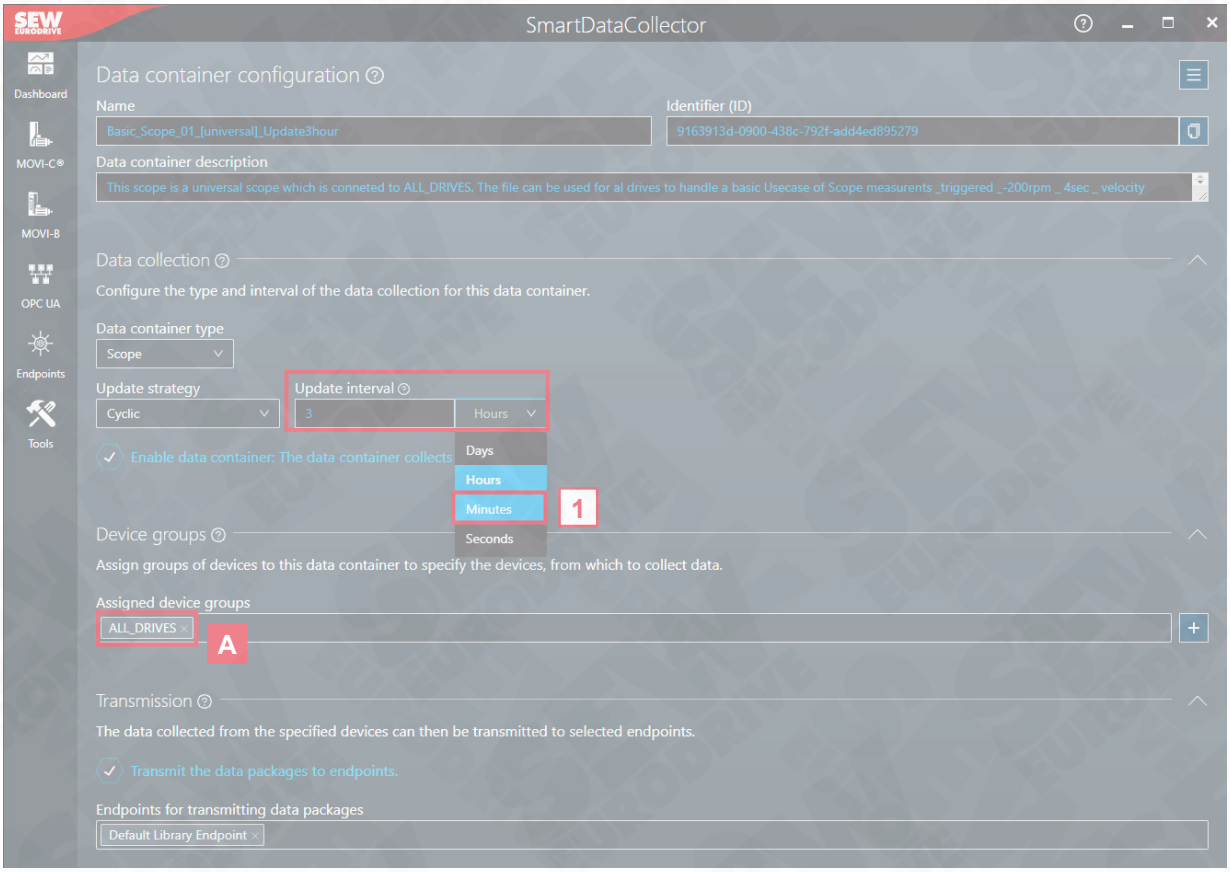
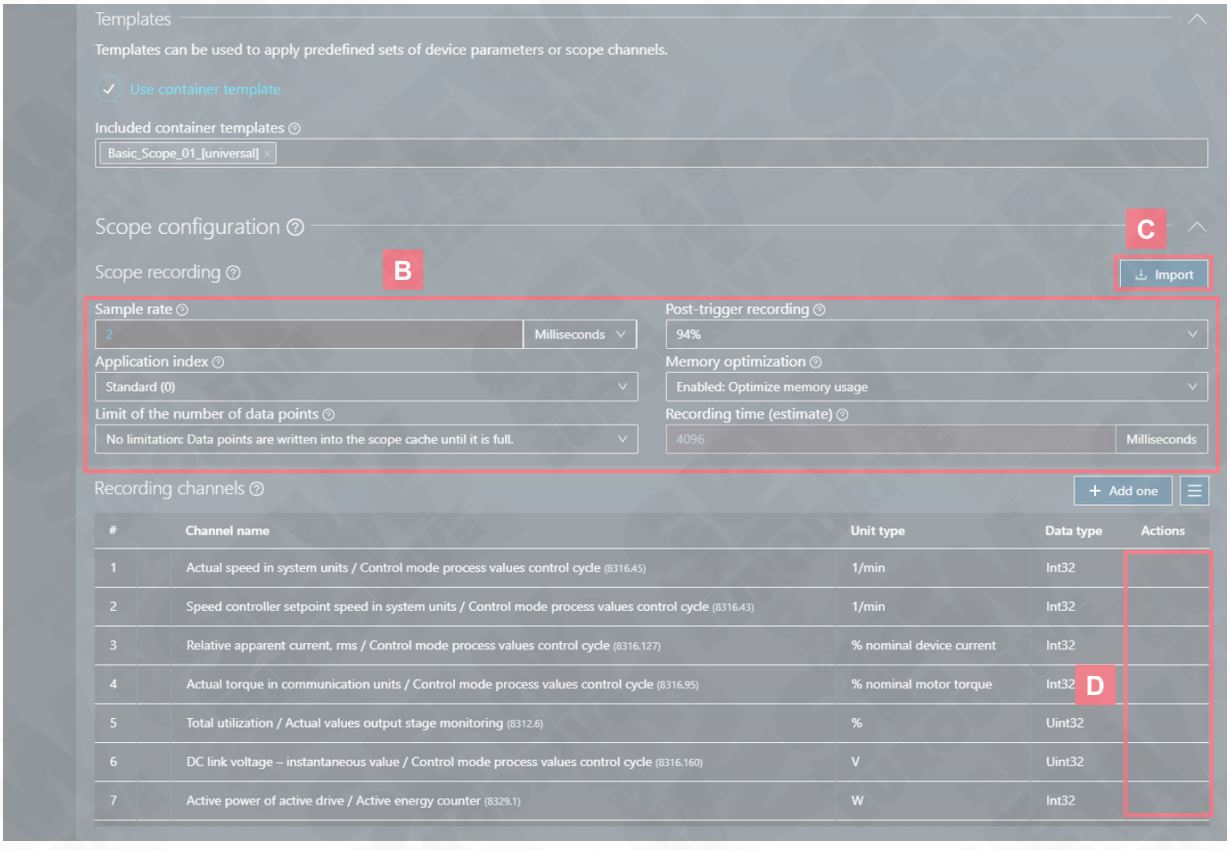
2. Properties of the Basic_Scope_01_[universal]_Update3hour container



1 Change the **Update interval** to the unit **Minutes** as part of the test purposes

A The container collects the scope records relevant for most applications and is therefore assigned to all drives



B The **Sampling rate** is preconfigured with 2 ms and a **Trigger advance** of 5%. This results in a **recording time** of approx. 4 s

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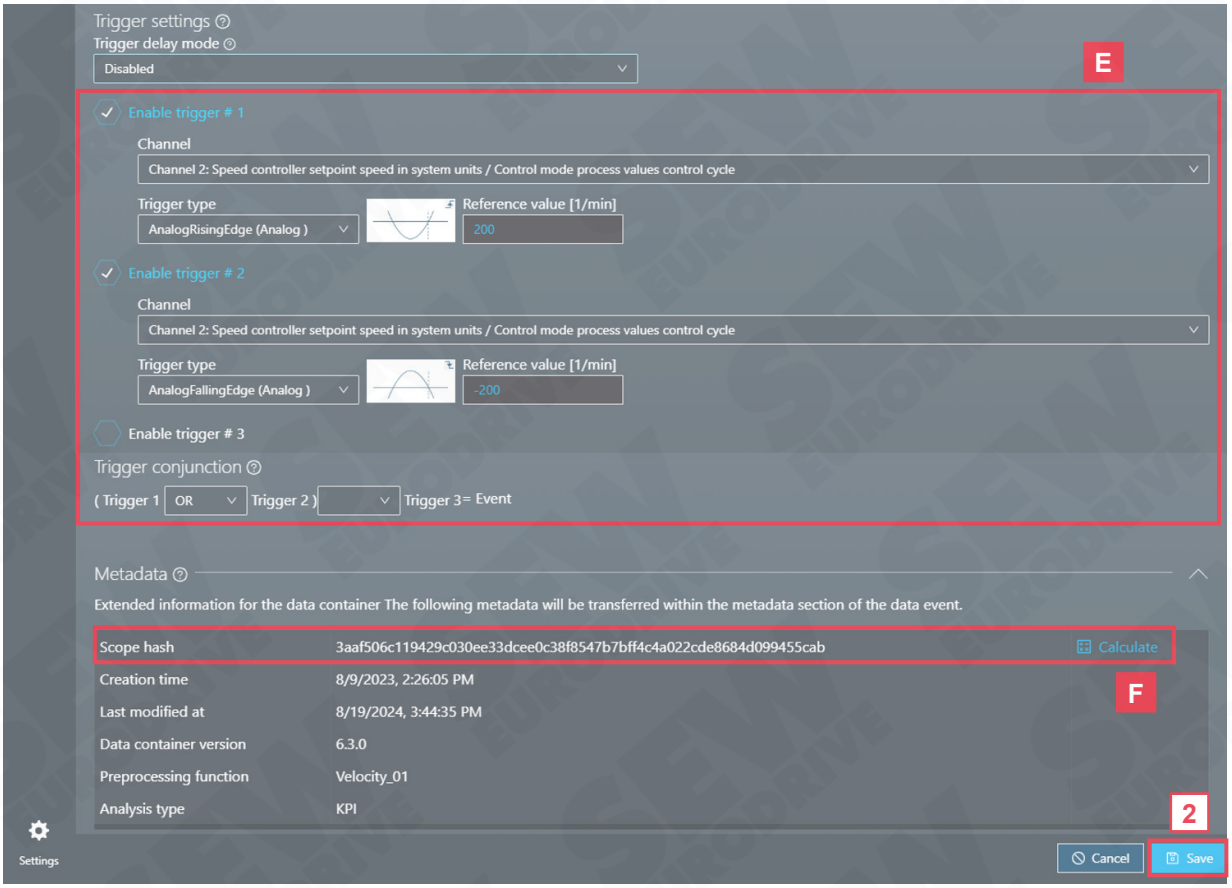
C Alternatively, you can **Import** a complete scope configuration from a MOVISUITE® MES or XML file or from a powered-on device

D The preconfigured channels cannot be edited or removed



E Activate the required number of **Triggers** (max. 3) and enter the **Channel name** and **Trigger type** using the selection boxes that appear. Decimal and hexadecimal values can also be entered in the **Reference value** input field. The hexadecimal values require the prefix ‘0x’. Ultimately, the scope triggers can still be connected to each other via Boolean operators

F The **Scope hash** maps the entire configuration of the container or container template in a string. After changing the configuration, the scope hash can be updated via Calculations

2 Click the **Save** button

The preconfigured **trigger** is triggered as soon as the drive exceeds the speed +/- 200 rpm. In this case, the scope recorder of the inverter is filled with the scope data and stores the data until the cycle time (3 h by default) is reached. If the trigger condition is met again in the cycle time, this no longer affects the output – the scope recorder of the inverter is filled only once. If the trigger condition is not met in the cycle time, no data is recorded.

The **scope hash** is used to compare scopes of the same configuration. However, if the settings of the drive train (e.g. via MOVISUITE®), the data may no longer be comparable (apples are compared to pears). The scope hash only contains the information of the scope configuration. Before starting data acquisition, make sure that the drive trains are fully configured.

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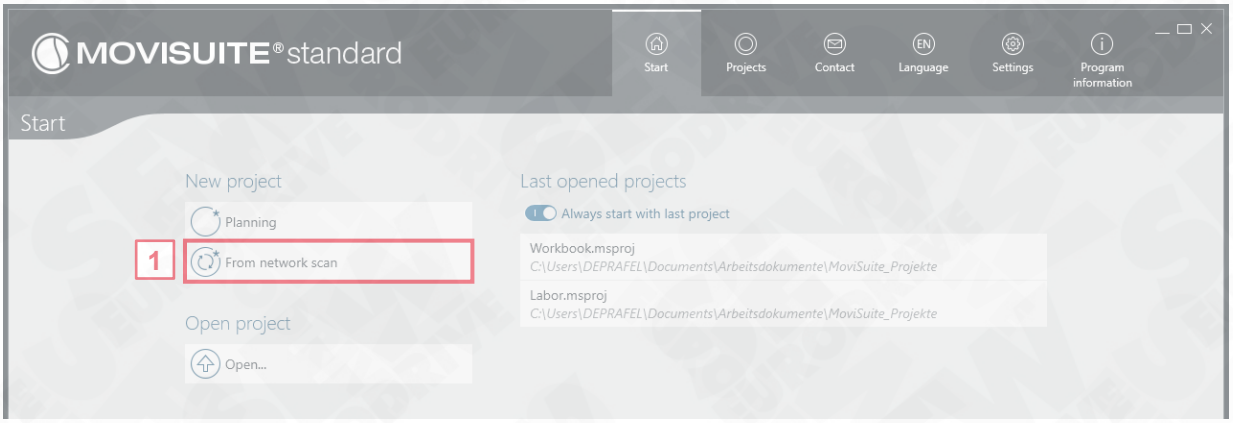
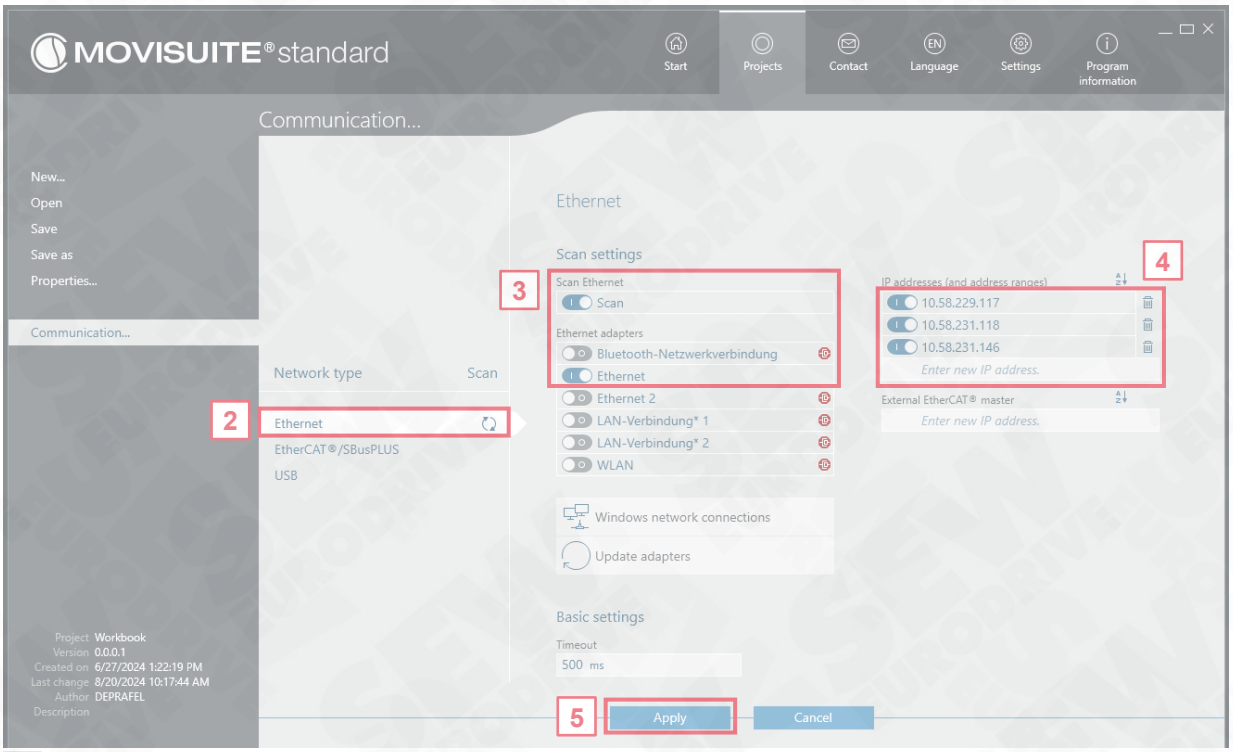
3. Manual operation of the inverter with MOVISUITE®



1 Open a new project from a network scan



2 Scan the devices via **Ethernet**

3 Activate **Scan** and the corresponding **Ethernet adapter** that is configured in the network area of the devices (see Chapter 5.1)

4 For networks that contain routers or managed switches, the destination **IP addresses** or **address ranges** must be explicitly specified

5 Click the **Apply** button

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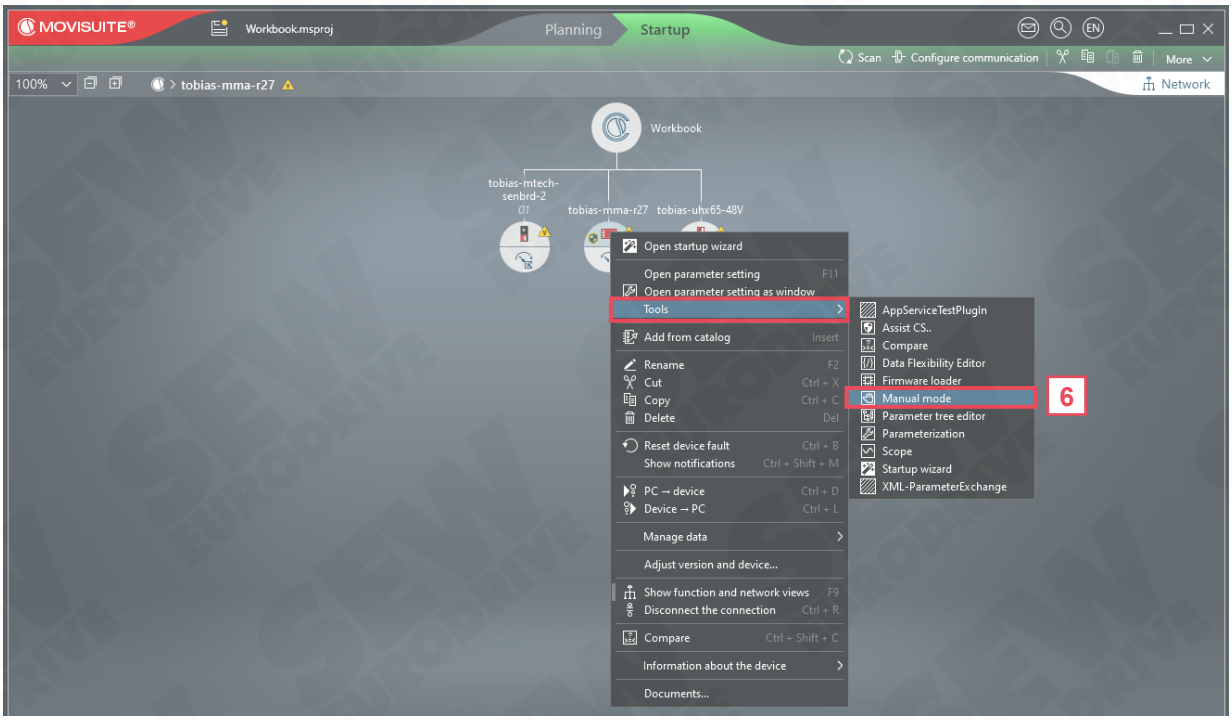
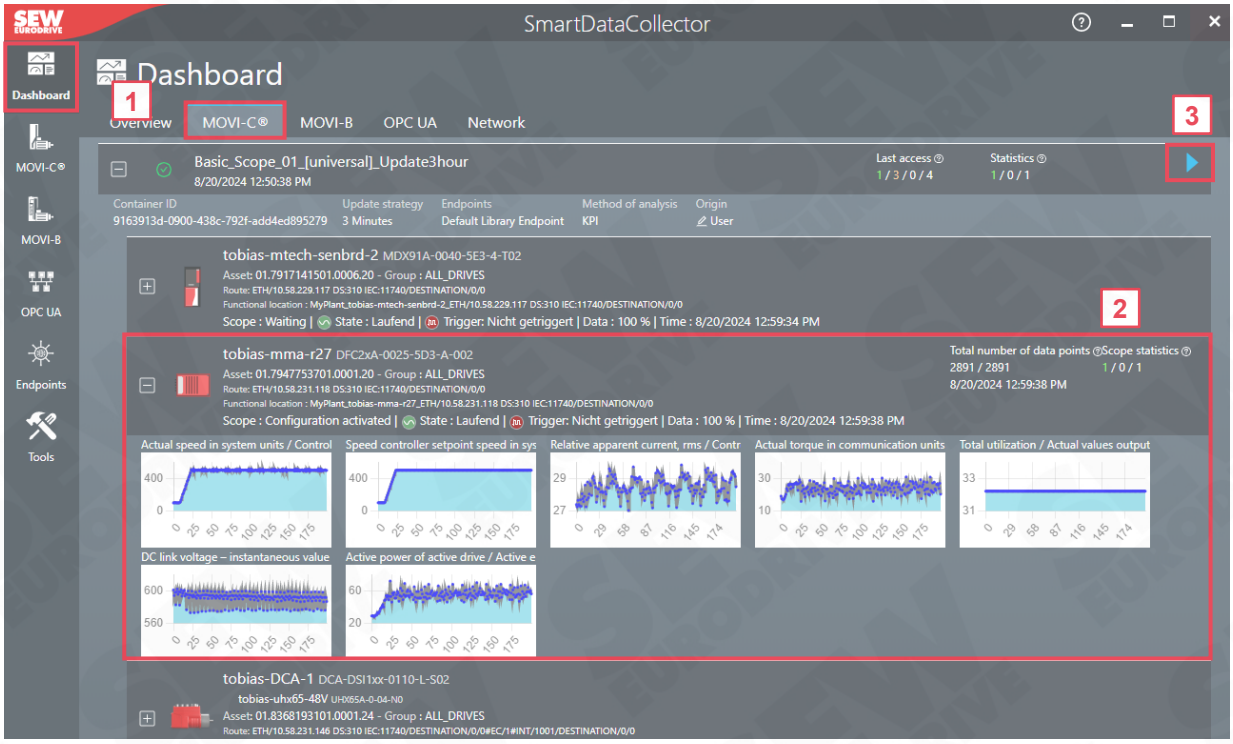


6 **Right-click** on the inverter you are looking at and go to **Manual mode** under **Tools** to start the motor

Enable the drive in manual mode, e.g. at 500 rpm.
The drive can continue to run or be stopped again because the trigger condition has already been met and the scope has already been recorded.

4. Result of the measurement in DriveRadar® SmartDataCollector



1 Switch back to DriveRadar® SmartDataCollector under **Dashboard** and **MOVI-C®**

2 If the cycle time of the scope container has already expired, the data entries are displayed

3 If the cycle time has not yet expired, the upload of the data in the scope recorder can alternatively be triggered manually via the **start icon**

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5. Further data viewing

- Check the JSON file of the scope measurement
  - Search for the assigned application type
  - Search for the scope hash
  - Interpret how the scope data is stored in the JSON file

6. Reset the default container to factory settings

1 The default container can be completely reset via **Reset to library state**

2 Alternatively, only the scope configuration can be reset via **Reload template**. All other settings such as the container name, cycle time, or assigned device groups remain

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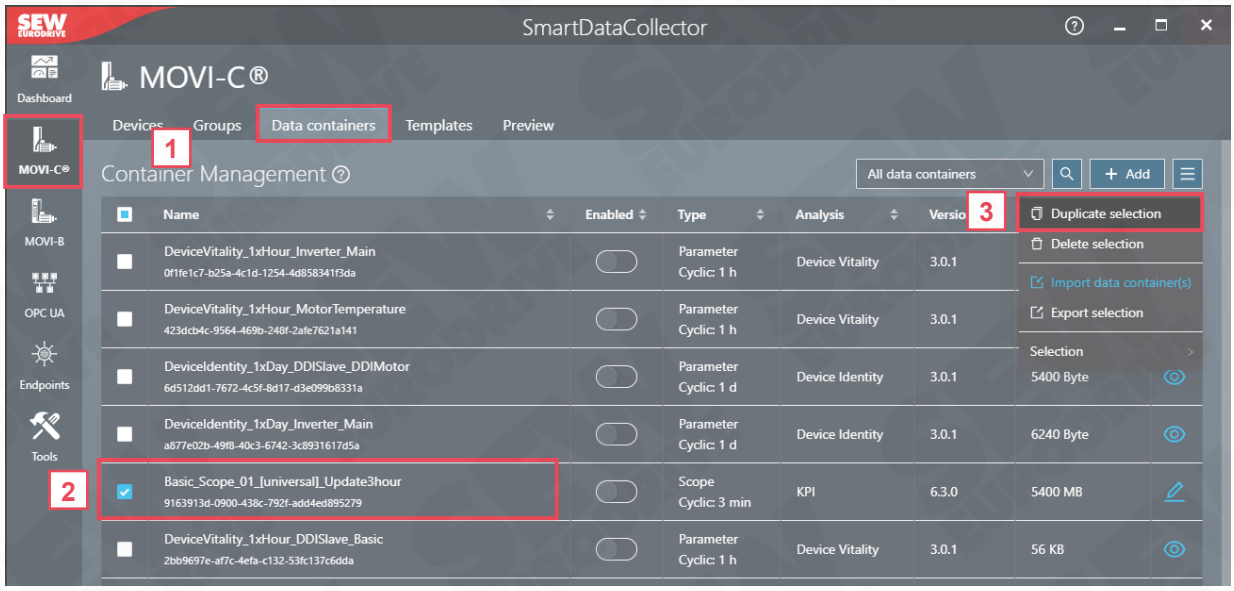
11.2 Creating scope containers

Compared to the parameter container, configuring a scope container requires considerable additional work. To create a scope container yourself, it is recommended to duplicate a similar scope container and adjust the copy in the settings.
Scope containers are often configured for an application type. Therefore, it makes sense to assign the scope container to the device group automatically generated from the application type (see Chapter 7).

1. Duplicate a scope container

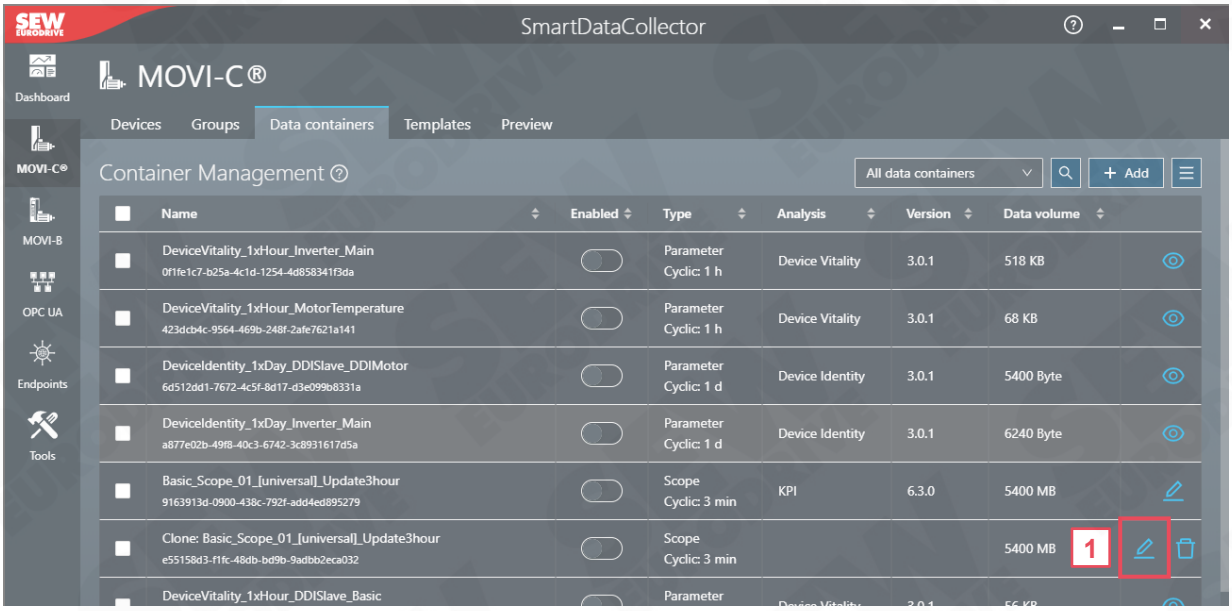


1 Open the **MOVI-C®** or **MOVI-B** category and select the **Data containers** tab

2 **Select** the standard container that comes closest to your application

3 Under the **Burger menu**, select **Duplicate selection**

2. Edit scope containers



1 **Edit** the scope container **Clone: Xxx**

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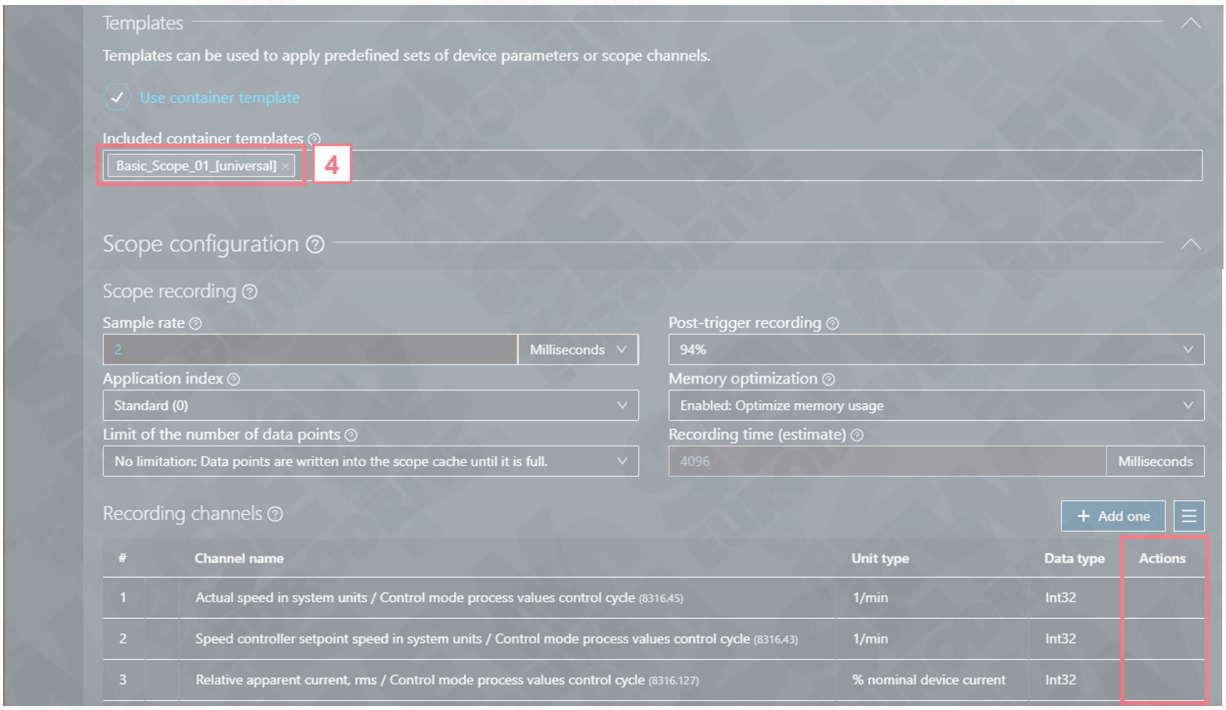
3. Container configuration

1 The **Name** of the scope container can be changed freely, e.g. to **MyScopeContainer**

2 The **Update strategy** and the **Update interval** can also be changed

3 Assign the **Device groups** of the application type to be monitored to the scope container



4 Remove the **Container template** to be able to edit the preconfigured channels under **Actions**

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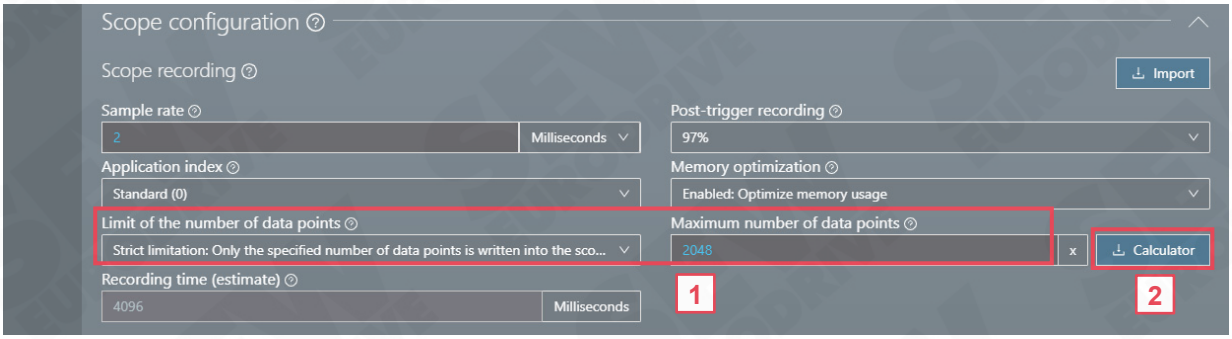
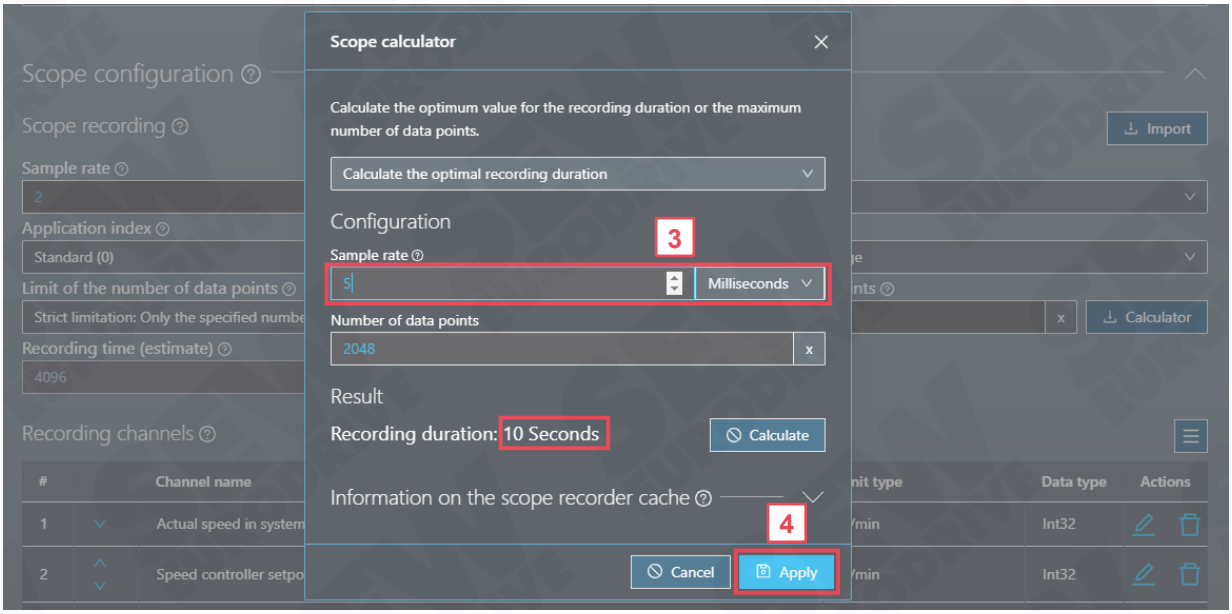
4. Scope configuration



1 The scope container is to be configured in a defined **Recording time** (10 s) and with a fixed number of **data points** (2048 → minimum number of data points for the IoT Suite). To do so, you must switch to **Strict limitation of the data points**

2 Select the **Calculator**



3 With the **Calculator**, the **Recording duration** can be calculated automatically from the **Sample rate** and the **data points**

4 Click the **Apply** button

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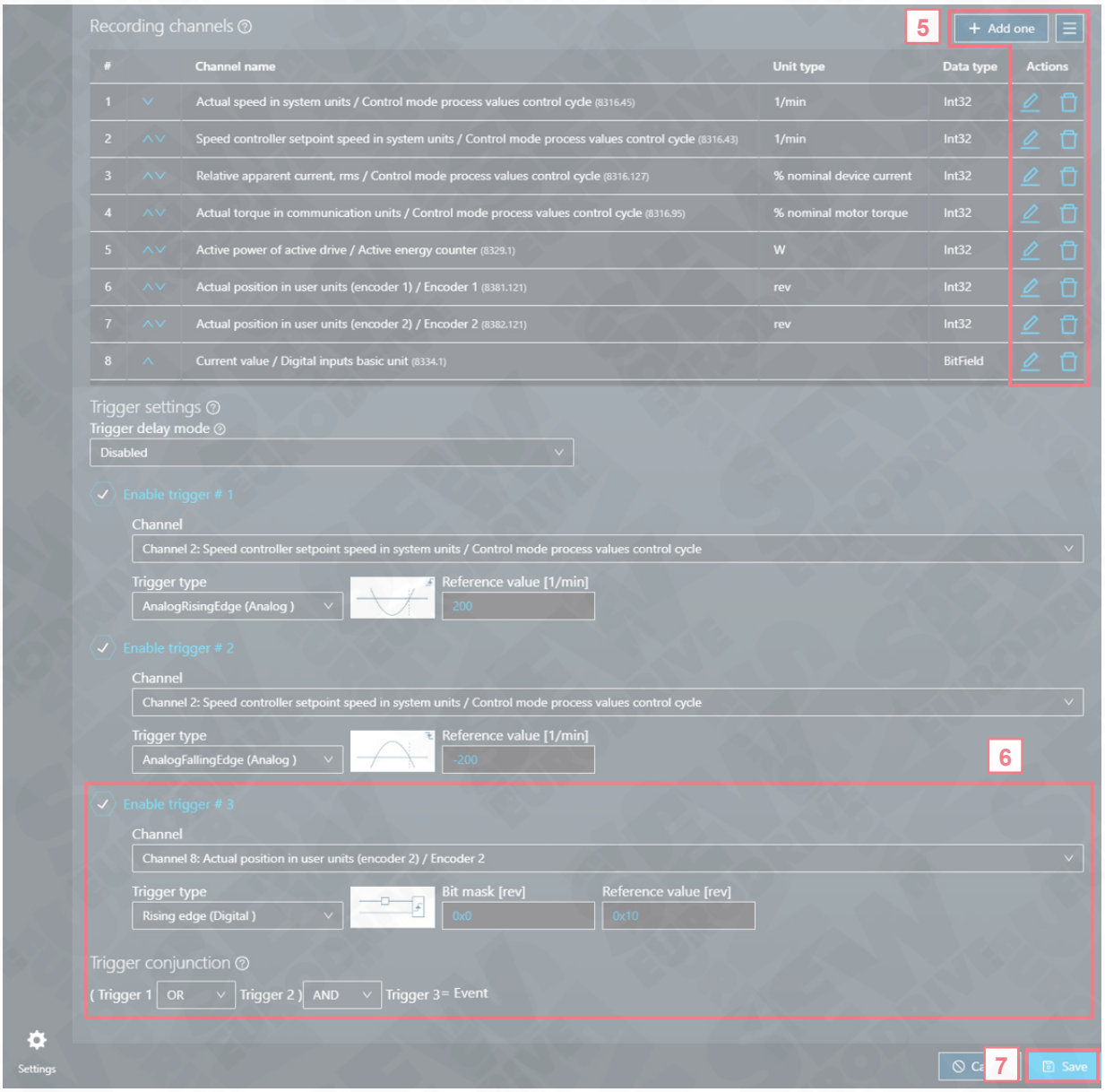

5 Remove unwanted preconfigured **Channels** and add new ones

6 Edit the preconfigured **Triggers** and add new ones

7 Click the **Save** button

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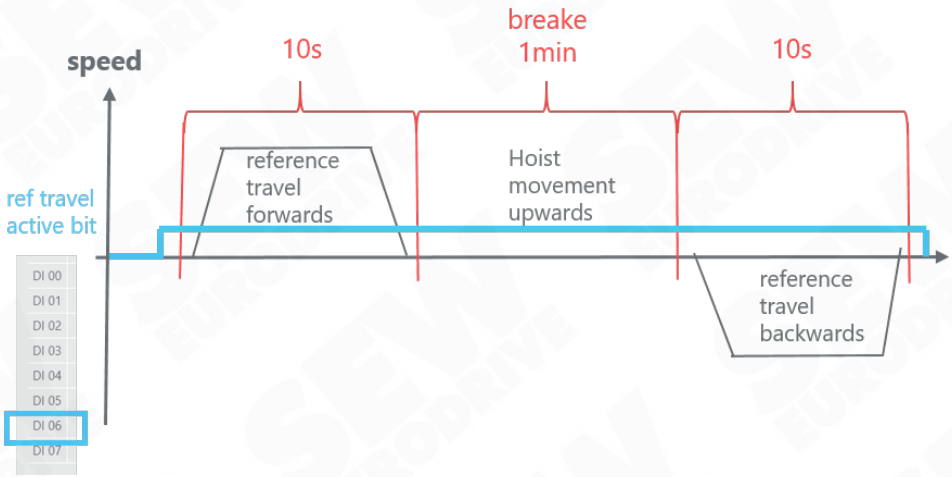
1. Configuration of a scope container for a storage and retrieval system

The travel drive of a storage and retrieval system (SRS) is to be monitored by a scope container. For this purpose, a reference travel is defined in which the SRS moves forwards for 10 s and backwards for 10 s. In between, the drive is stopped by the brake for one minute and the hoist is moved downwards. Reference travel is initiated via control bit DI 06.



- Create metadata
  - Create an application type '*Stacker crane travel drive*'
  - Derive a device group and name it '*Travel drive device group*'
  - Assign the application type, the device group and its functional location to the drive
- Select the most suitable standard container for the application
  - Relevant parameters for the measurement are: Speed, current, torque, position and power
  - Sample rate: As fast as possible
- Change the scope configuration and triggers according to the application
  - Recording time: *1 min.*
  - Trigger: Positive OR negative reference travel AND control bit DI 06
- Use the calculator in the scope configuration
  - Set the maximum number of data points for an recording time of 10 s.
- Activate the container
  - Start manual mode in MOVISUITE® (load change mode)
  - Check the results in DriveRadar® SmartDataCollector

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DRIVE ACADEMY®
SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Str. 42
D-76646 Bruchsal
Tel. +49 (0)7251 75-3911

www.sew-eurodrive.de

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