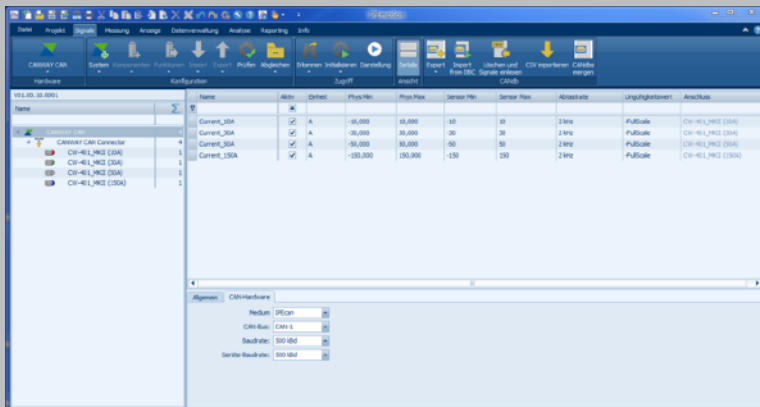


CW-401 MkII

CANWAY Plug-in for IPEmotion



Documentation

Document Version: 1.0
Date: 22. April 2020

CANWAY TECHNOLOGY GMBH
Graf-Zeppelin-Ring 13
D-48346 Ostbevern

Phone: +49 2532 95602 - 0

mail@canway.de
www.canway.de

This document and the concepts presented in it are the intellectual property of CANWAY TECHNOLOGY GMBH. All information must be treated confidentially. Use for other purposes and disclosure to third parties - even in part - is not permitted without the written consent of CANWAY.

Technical changes and errors excepted. Product names mentioned may be trademarks of their respective owners.

Warranty and Safety Notes

The content of this document is provided "as is". The content is subject to change in future editions without notice. Furthermore, to the maximum extent permitted by applicable law, CANWAY disclaims all warranties, either express or implied, with regard to this manual and any information contained herein; this includes but is not limited to the implied warranties of merchantability and fitness for a particular purpose. CANWAY does not accept any liability for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein.

Safety

The following general safety precautions must be observed during all phases of operation of this device. Failure to comply with these precautions or with specific warnings or instructions elsewhere in this manual violates safety standards of design, manufacture, and intended use of the device. CANWAY assumes no liability of the customer's failure to comply with the requirements.

General

Do not use this device in any manner not specified by the manufacturer. The protective features of this device may be impaired if it is used in a manner not specified in the operation instructions.

Before applying Power

Verify that all safety precautions are taken. Make all connections to the unit before applying power.

Do not modify the Device

Do not install substitute parts or perform any unauthorized modification to the device. Return the device to CANWAY for service and repair to ensure that safety features are maintained.

In Case of Damage

Devices that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

Info: No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from CANWAY TECHNOLOGY GMBH as governed by German and international copyright laws.

Table of Contents

1. General Information	4
2. Installation/Deinstallation	5
2.1. System Requirements	5
2.2. Installation	5
2.3. Deinstallation	5
3. Working with the CANWAY Plug-in	6
3.1. Hardware Detection	6
3.2. Adding current clamps manually	6
3.3. Synchronization	10
3.4. CANWAY System	11
3.5. CANWAY CAN Connector	12
3.6. CW-401 MkII Current Clamp	13
3.6.1. Information	13
3.6.2. Connection	14
3.6.3. Automatic CAN ID	14
3.6.4. Average Value	15
3.7. Current Channel	15
3.8. Offset Correction	16
3.9. Options	16
3.9.1. Automatic CAN ID	17
3.9.2. Hardware Detection	17
3.10. CANdb Export	18
4. Technical Data	19
5. Document History	20

1. General Information

This manual describes the structure and functions of the CANWAY IPEmotion plug-in. It shows you how to configure CW-401 MkII current clamp in order to integrate them into the IPEmotion data acquisition system.

Further technical information can be found in the CW-401 MkII current clamp data sheet.

The CANWAY plug-in is supported from IPEmotion version 2018 R3 (32 bit or 64 bit).

The following current clamps are supported:

- ▶ CW-401 MkII 10 A
- ▶ CW-401 MkII 30 A
- ▶ CW-401 MkII 50 A
- ▶ CW-401 MkII 150 A



2. Installation/Deinstallation

2.1. System Requirements

The minimum hardware requirements correspond to those of the IPEmotion version used.

2.2. Installation

You need administrator rights on your PC for the installation of the plug-in.

Extract the ZIP file and start the installation. The installation wizard will guide you through the installation.

After successful installation, the plug-in will be listed in IPEmotion as available plug-in.

2.3. Deinstallation

1. Click the Windows Icon in the status bar and select **Settings**.
2. Click **Apps**.
3. Select CANWAY IPEmotion plug-in Vxx.xx.xx.xxxx and to uninstall.

After successful deinstallation the plug-in is removed from your computer and is no longer integrated into IPEmotion.

3. Working with the CANWAY Plug-in

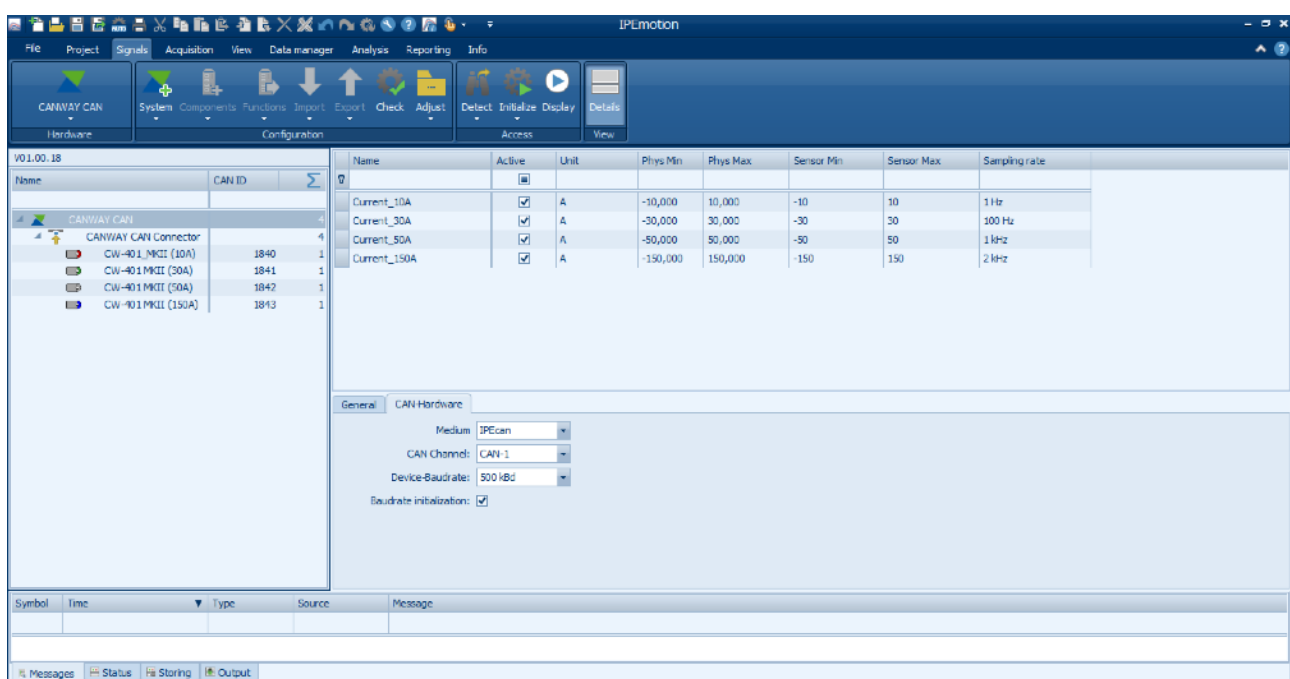
The following chapter gives you an overview of how to use the plug-in. It shows you how to configure the devices and prepare them for a measurement.

3.1. Hardware Detection

The plug-in is able to automatically detect all connected and supported CANWAY devices with IPEmotion's hardware detection feature.

The plug-in searches CANWAY devices on all connected CAN busses, reads their configuration and assembles the devices in the IPEmotion overview. In case of a hardware detection, all configurations, including those of other plug-ins, will be deleted.

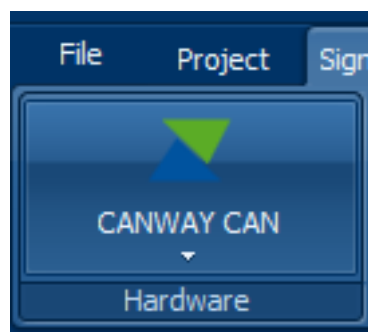
The following figure shows an example configuration with four current clamps:



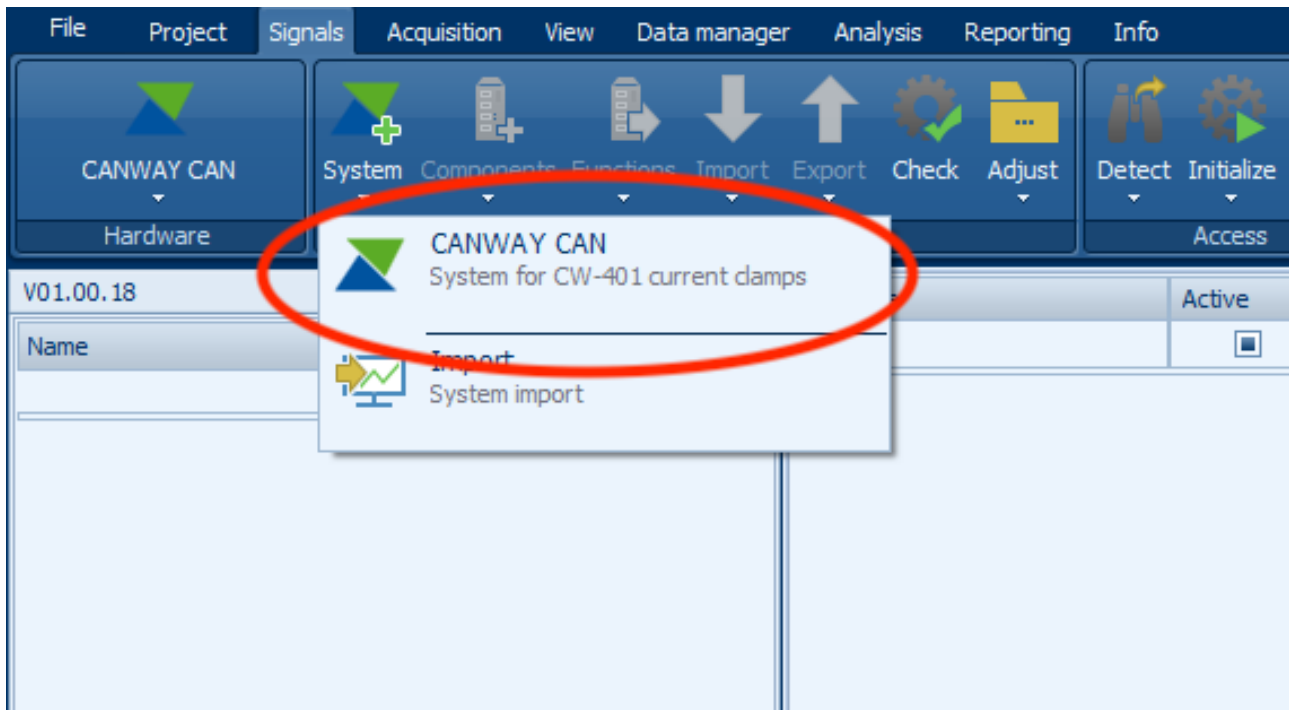
3.2. Adding current clamps manually

You can add current clamps manually to your configuration:

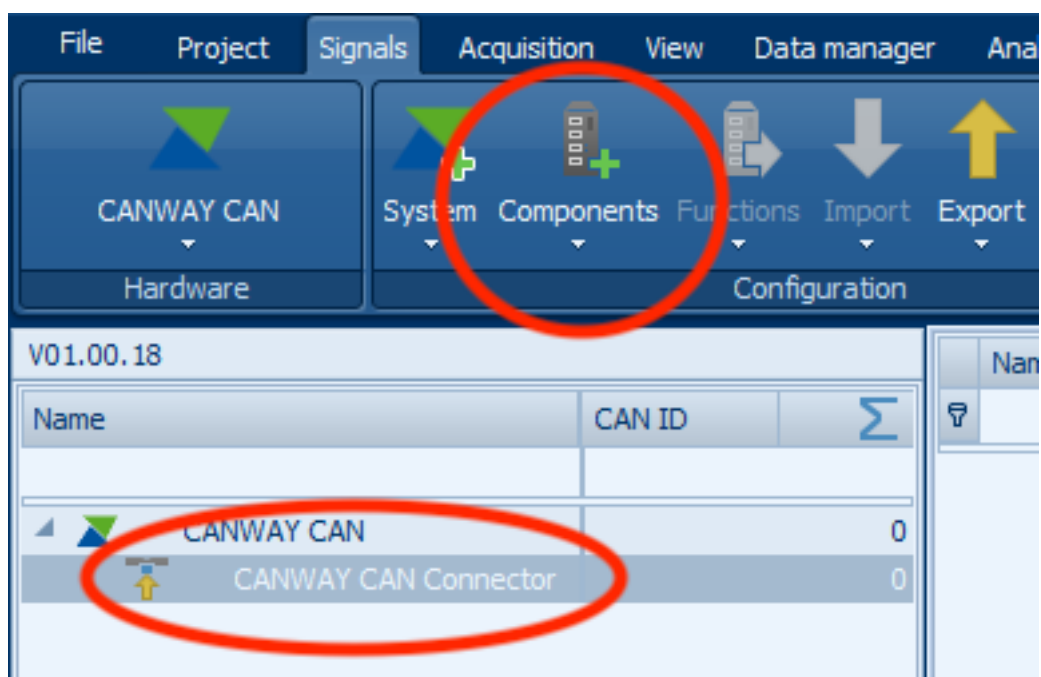
1. If the CANWAY plug-in is not selected as hardware, click on **Hardware** in IPEmotion and select the CANWAY plug-in in the list.



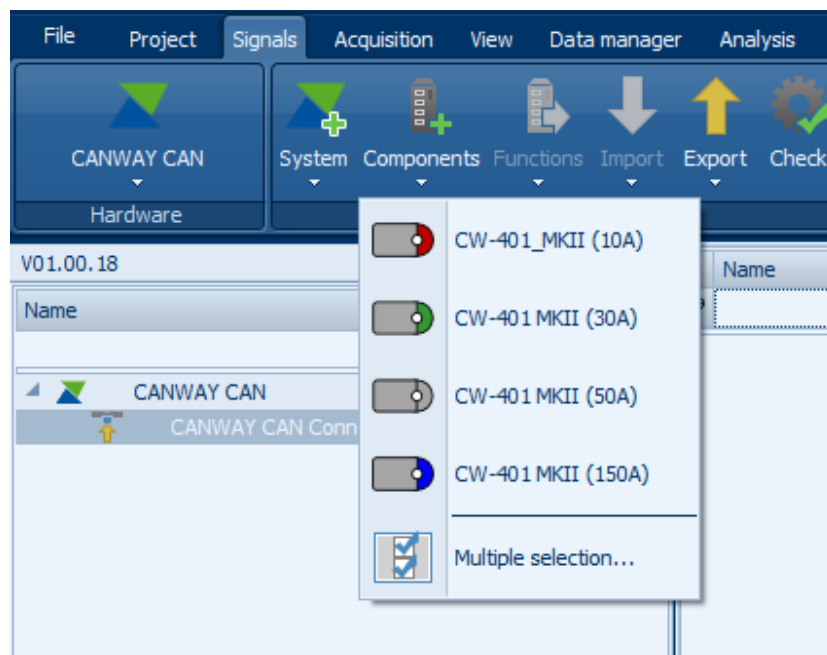
- Next to the **CANWAY CAN Hardware** button you will find the CANWAY **System**. Click on **System** and select **CANWAY CAN**.



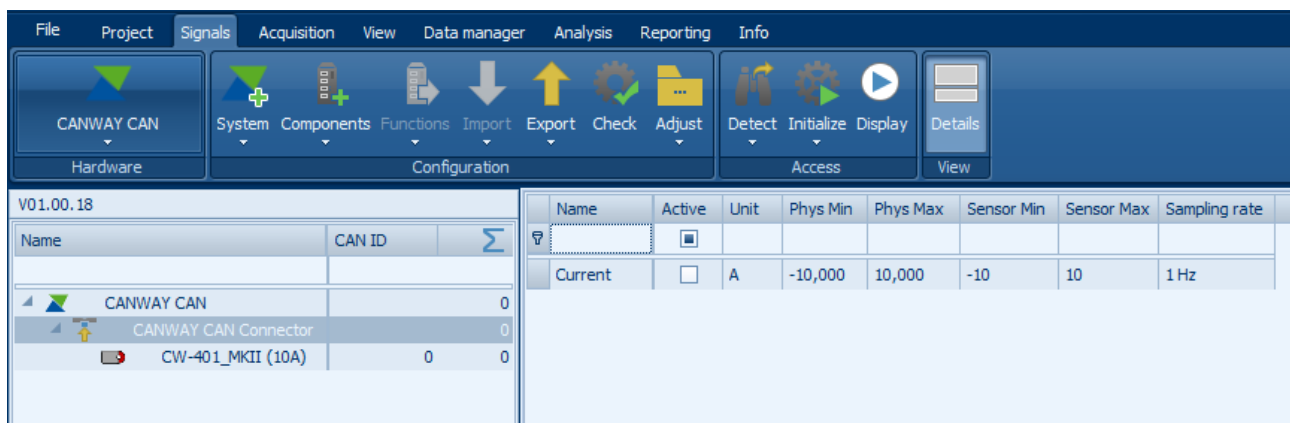
- By clicking on **CANWAY CAN**, IPEmotion adds a **CANWAY CAN** system to the tree structure. At the same time the **CANWAY CAN** system is extended by a **CANWAY CAN Connector** as a subelement. Click on the **CANWAY CAN Connector** and unlock the **Components** button.



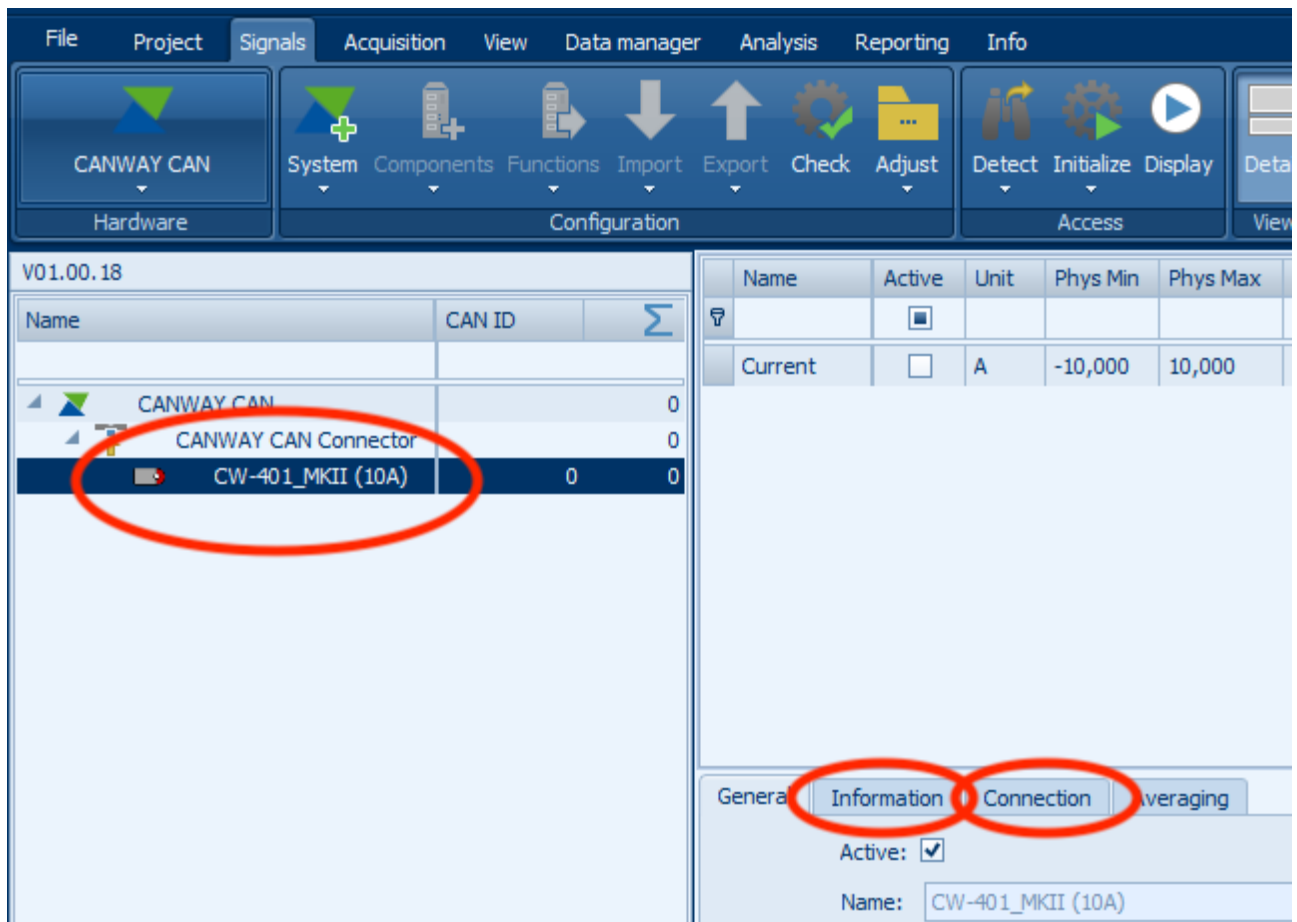
4. Click on **Components**. A selection of the supported CANWAY current clamps opens.



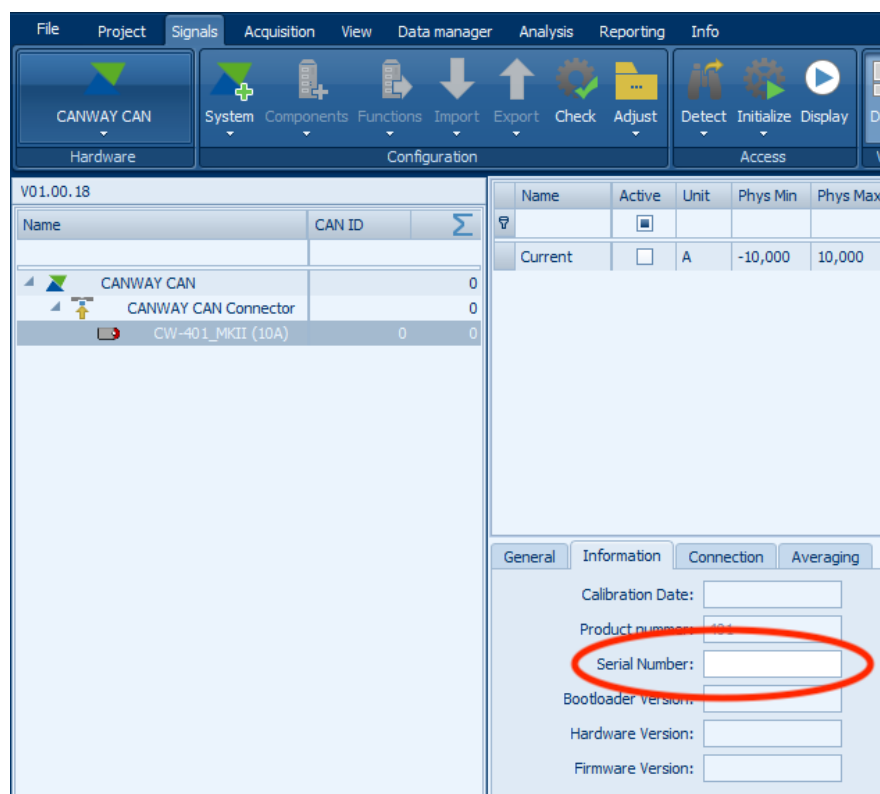
5. Add one or more current clamps to the CANWAY tree structure.



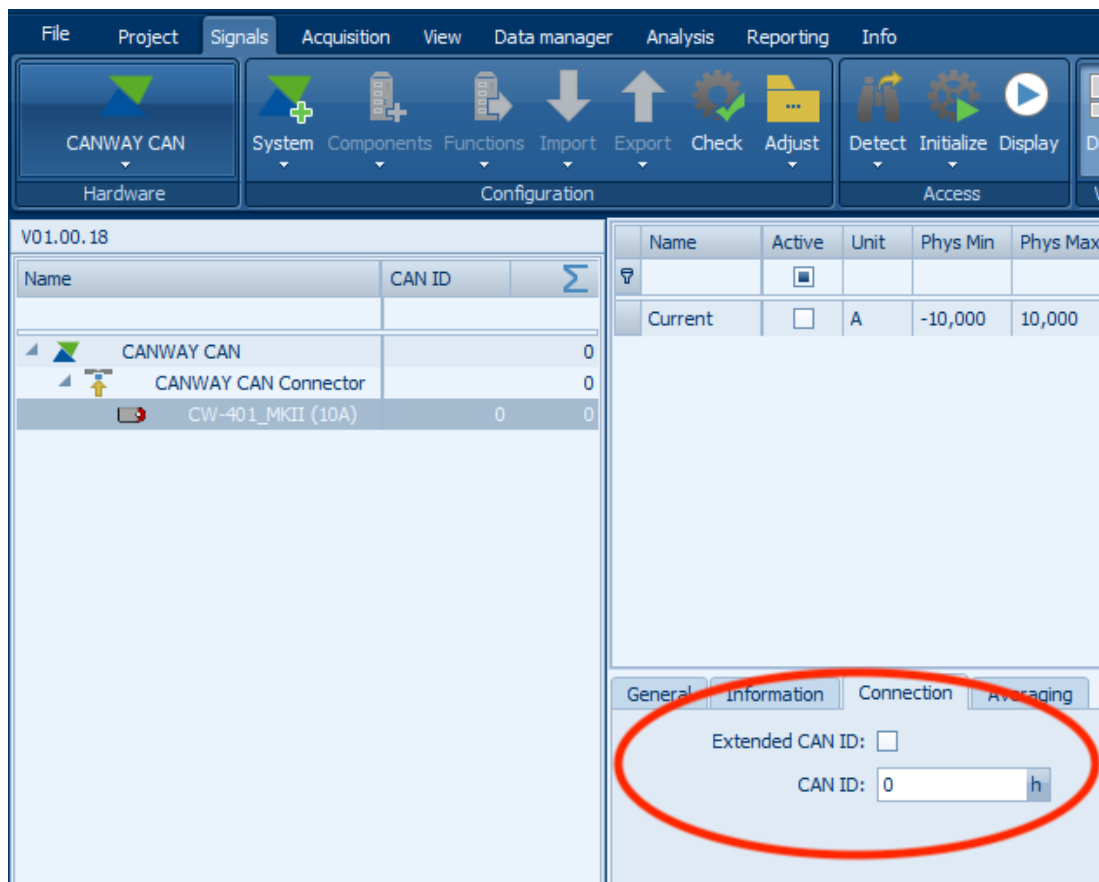
6. Click on the current clamp. IPEmotion displays two tabs, **Information** and **Connection**.



7. Open the tab **Information** and enter the serial number of the current clamp.

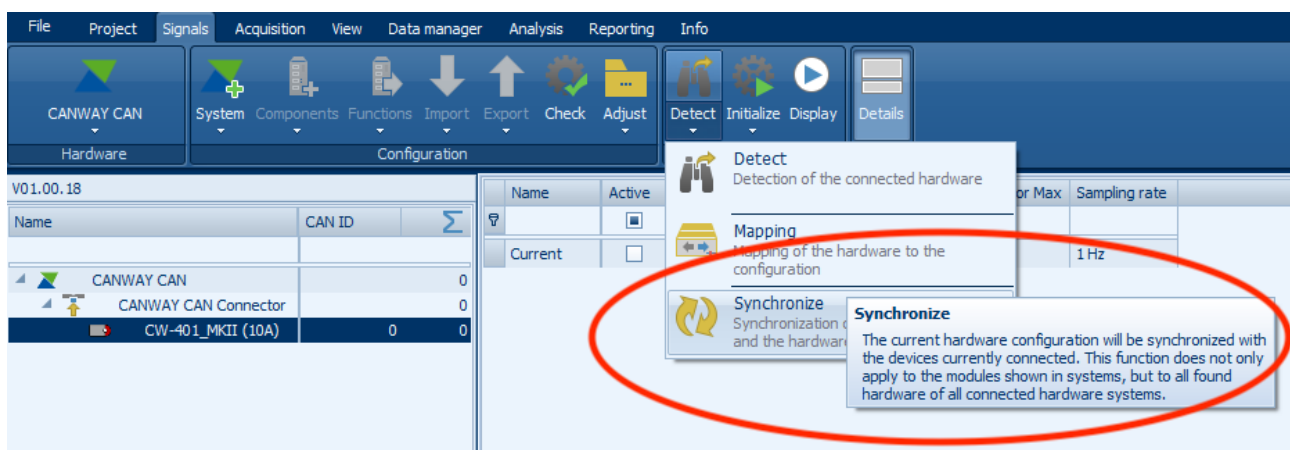


- Open the **Connection** tab and specify whether the current clamp uses an extended CAN ID and set the CAN ID of the current clamp.



3.3. Synchronization

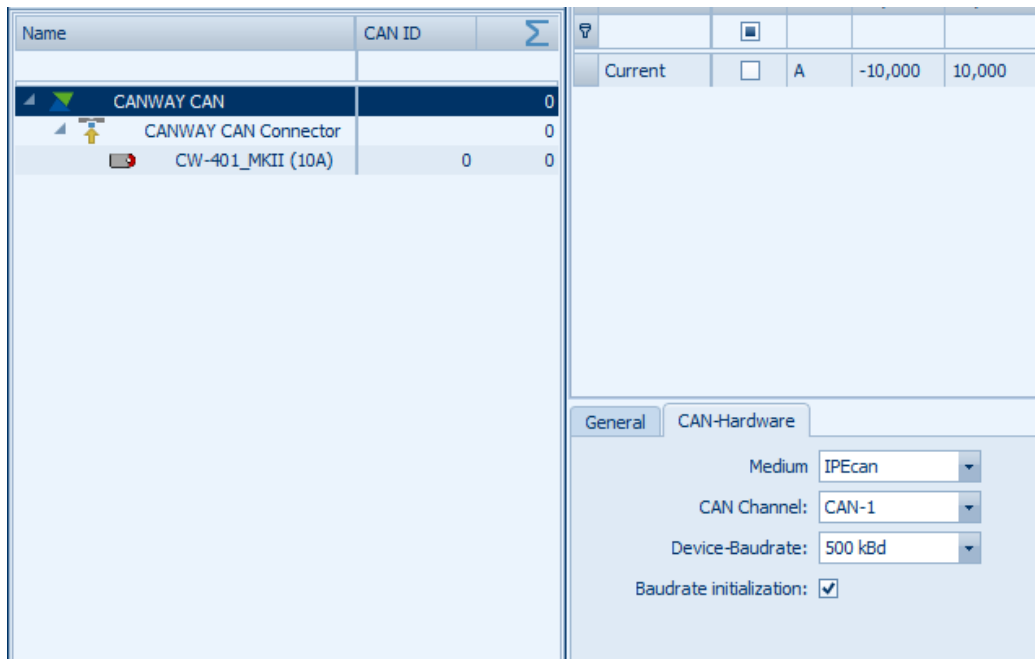
In case of a hardware detection all configurations, including those of other plug-ins, are deleted. To integrate new current clamps into your measurement hardware, perform a synchronization in IPEmotion.



Synchronization will not remove configured current clamps from IPEmotion. The system scans all CAN busses and adds all newly found current clamps whose serial numbers are not listed in the existing configuration.

3.4. CANWAY System

A CANWAY system represents a CAN adapter and its settings



The following parameters can be configured in the **CAN-Hardware** tab:

- Medium: Connected CAN adapter, e.g. IPEcan
- CAN Channel: Used CAN bus at the Medium
- Device-Baudrate: Baudrate of the connected current clamps
- Baudrate initialization: When configuring the CAN bus, the baud rate of the CAN bus is initialized if necessary. Please note that only one plug-in is allowed to perform the baud rate initialization.

During hardware detection, parameters and properties (see sections 3.4, 3.6, and 3.7) are read from the current clamps connected at the CAN bus.

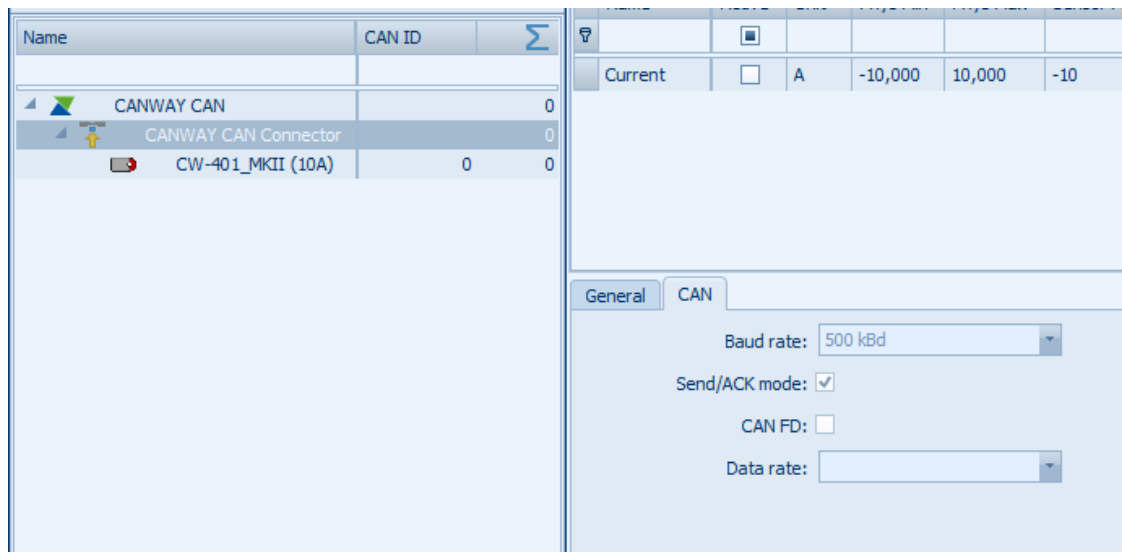
After successfully changing the device baud rate, the default baud rate may have to be adjusted in the options (see sections 3.9.2). A hardware detection is always executed with the default baud rate set in the options.

If devices from different manufacturers are used on a single CAN bus, make sure that the devices are separated according to manufacturer before changing the device baud rate. It is not possible to change the device baud rate via several plug-ins.

All other configurations, such as name assignment or descriptions in the **General** tab, are not described here or in the following chapters since they are not specific to the plug-in. For more details, refer to the IPEmotion documentation.

3.5. CANWAY CAN Connector

The CANWAY CAN Connector is not configurable. All parameters in the tabs are read-only.



The baud rate displayed in the **CAN** tab corresponds to the CAN bus baud rate of the connected CAN adapter.

3.6. CW-401 MkII Current Clamp

3.6.1. Information

With the hardware detection product information will be read from the current clamps, which is displayed in the **Information** tab.

The screenshot displays the CANWAY software interface. On the left, a tree view shows the configuration hierarchy: 'V01.00.18' (CANWAY CAN) with a count of 3, 'CANWAY CAN Connector' with a count of 3, and three 'CW-401 MKII' units with CAN IDs 1841, 1840, and 1842, each with a count of 1. On the right, the 'Information' tab is active, showing a table with columns: Name, Active, Unit, Phys Min, and Phys Max. The 'Current' row is highlighted, showing it is active (checked box), in Amperes (A), with a range from -30,000 to 30,000. Below the table, the 'Information' tab contains fields for: Calibration Date (29.10.2018), Product number (401), Serial Number (1838053), Bootloader Version (2), Hardware Version (1.1), and Firmware Version (1.8).

Name	Active	Unit	Phys Min	Phys Max
Current	<input checked="" type="checkbox"/>	A	-30,000	30,000

Field	Value
Calibration Date:	29.10.2018
Product number:	401
Serial Number:	1838053
Bootloader Version:	2
Hardware Version:	1.1
Firmware Version:	1.8

The following values can be read out:

- ▶ Date of the latest calibration
- ▶ Product number
- ▶ Serial number
- ▶ Bootloader version
- ▶ Hardware version
- ▶ Firmware version

The serial number can be edited to identify a current clamp when manually assembling a configuration. The serial number cannot be written into a current clamp.

3.6.2. Connection

In the tab **Connection** the CAN ID is configurable with the following parameters:

- ▶ Activate/deactivate extended CAN ID
- ▶ CAN ID of the current clamp

Name	Active	Unit	Phys Min	Phys Max	Se
Current	<input checked="" type="checkbox"/>	A	-30,000	30,000	-30

General	Information	Connection	Averaging
Extended CAN ID: <input type="checkbox"/>			
CAN ID: <input type="text" value="731"/> h			

3.6.3. Automatic CAN ID

In the plug-in options (see section 3.9.1) an automatic CAN ID assignment can be activated or deactivated. It is possible to detect or read out multiple current clamps with the same CAN ID.

To reconfigure duplicate CAN IDs, the button **Initialize** must be executed. The plug-in sorts the CAN IDs according to the specified start CAN ID and shows the modified CAN IDs. After executing the initialization again, the CAN IDs are transferred to the respective current clamps.

Name	Active	Unit	Phys Min	Phys Max	Sensor Min	Sensor Max	Sampling rate
Current	<input checked="" type="checkbox"/>	A	-30,000	30,000	-30	30	50 Hz
Current	<input checked="" type="checkbox"/>	A	-30,000	30,000	-30	30	50 Hz
Current	<input checked="" type="checkbox"/>	A	-30,000	30,000	-30	30	50 Hz

General	CAN-Hardware
Medium: <input type="text" value="IPEcan"/>	
CAN Channel: <input type="text" value="CAN-1"/>	
Device-Baudrate: <input type="text" value="500 kBd"/>	
Baudrate initialization: <input checked="" type="checkbox"/>	

3.6.4. Average Value

The averaging in the current clamp can be configured in the tab **Averaging**.

The screenshot shows the CANWAY CAN configuration window. On the left, a tree view shows the hierarchy: CANWAY CAN (3 channels), CANWAY CAN Connector (3 channels), and three CW-401 MKII channels with CAN IDs 1840, 1841, and 1842. On the right, a table lists the channels with columns: Name, Active, Unit, Phys Min, Phys Max, and Sensor. The 'Current' channel is active and has a unit of 'A'. Below the table, the 'Averaging' tab is selected, showing 'Averaging: ☒' and 'Samples of the averaged values: 16 d'.

Name	Active	Unit	Phys Min	Phys Max	Sensor
Current	<input checked="" type="checkbox"/>	A	-30,000	30,000	-30

Averaging: ☒
Samples of the averaged values: 16 d

The following parameters can be configured in detail:

- ▶ Activate/deactivate averaging
- ▶ Samples of the averaged values

3.7. Current Channel

The current channel corresponds to a typical IPEmotion channel. For this reason the channel configuration is not discussed in detail here.

Note: Channel name, sampling rate, CAN ID and averaging are written to the current clamp during initialization.

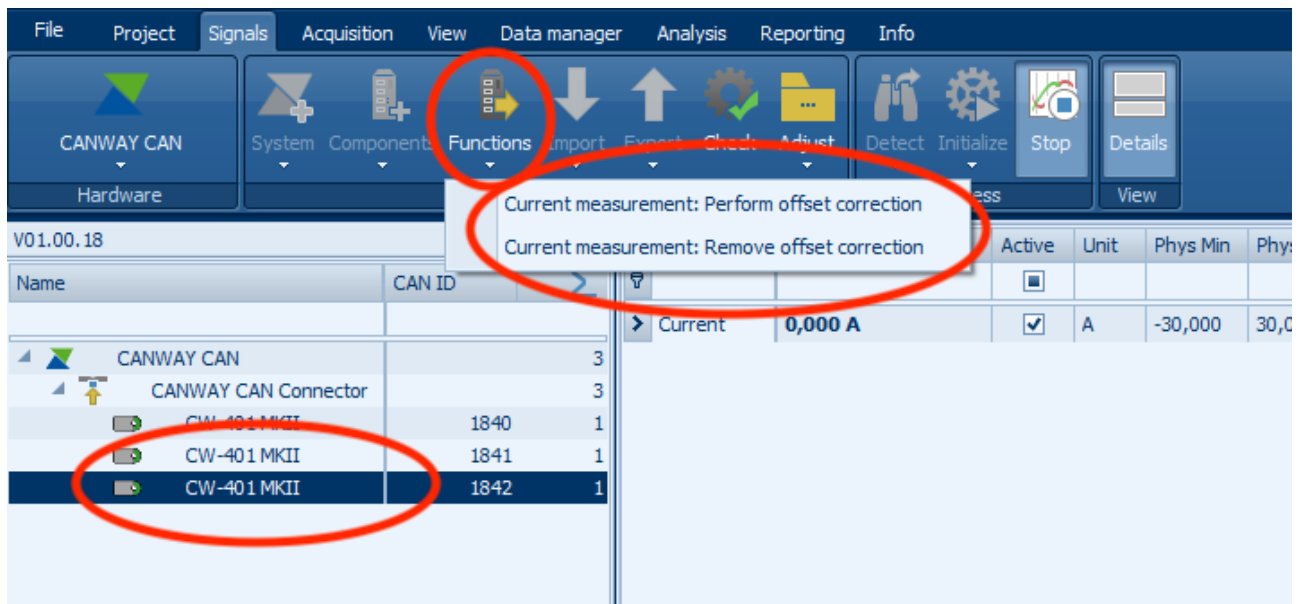
The screenshot shows the CANWAY CAN configuration window with the 'Scaling' and 'Display' tabs selected. The 'Current' channel is active and has a unit of 'A'. The 'Scaling' tab shows 'Active: ☒', 'Name: Current', 'Description: Current', and 'Reference: Current///CW-401 MKII/CANWAY CAN'. The 'Display' tab shows 'Sampling rate: 50 Hz'.

Name	Active	Unit	Phys Min	Phys Max	Sensor Min	Sensor Max	Sampling rate
Current	<input checked="" type="checkbox"/>	A	-30,000	30,000	-30	30	50 Hz

General | Scaling | Display
Active: ☒
Name: Current
Description: Current
Reference: Current///CW-401 MKII/CANWAY CAN
Sampling rate: 50 Hz

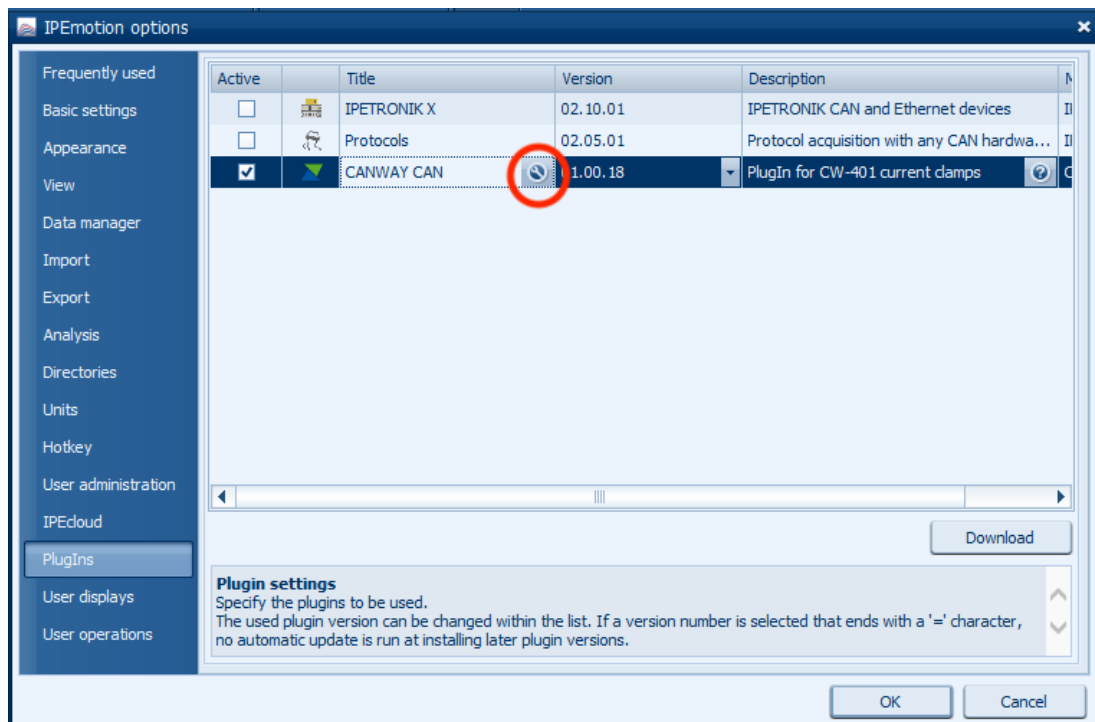
3.8. Offset Correction

During measurement it is possible to start an offset correction in the current clamp or to cancel a correction already carried out. To start an offset correction click on the current clamp to unlock the **Functions** button. Click on **Functions** to see the correction functions.

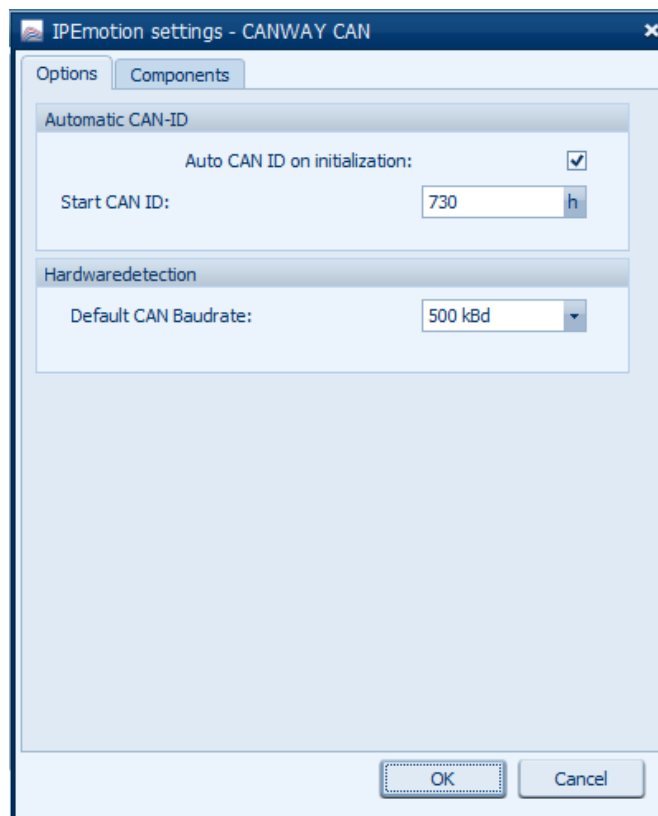


3.9. Options

The plug-in provides specific options. Select the CANWAY plug-in under File -> Options -> plug-ins and click on the wrench icon.



A window with the plug-in options opens.



The parameters are explained below:

Auto CAN ID on initialization:	Enables/disables the automatic CAN ID assignment
Start CAN ID:	Assigns the current clamps ascending IDs from this value
Default CAN Baudrate:	Specifies the baud rate at which a hardware detection is executed.

3.9.1. Automatic CAN ID

Duplicate CAN IDs can cause conflicts on the CAN bus. If current clamps are read in with duplicate CAN IDs during the hardware detection, CAN IDs can be reassigned automatically by the plug-in (see section 3.6.3).

The function Auto CAN ID on initialization is active by default and can be deactivated.

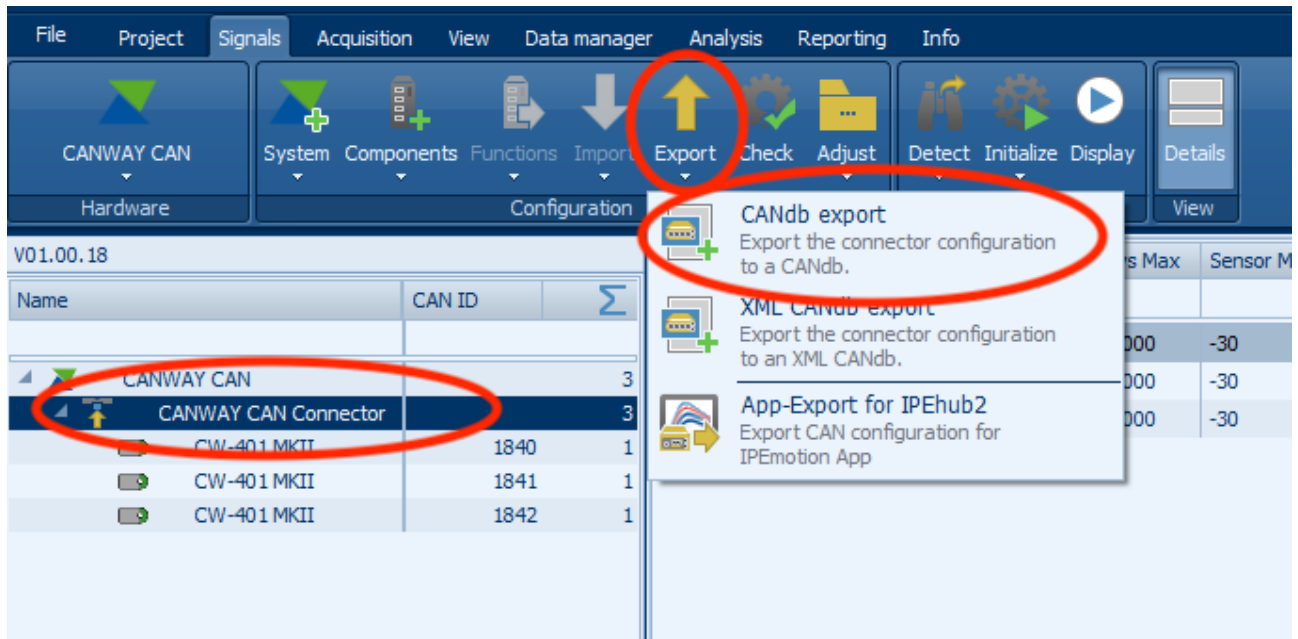
A Start CAN ID can be set. The CAN IDs of the current clamps are incremented accordingly.

3.9.2. Hardware Detection

In the options of the plug-in the default baud rate is configurable. The default baud rate is used for hardware detection. If this default baud rate does not match the baud rate of the current clamps on the CAN bus, this can lead to conflicts.

3.10. CANdb Export

The plug-in allows the export of a channel configuration into a CANdb file. Click on the **CANWAY CAN Connector**. The **Export** button is unlocked. Click on **Export** and select **CANdb Export** and follow the instructions.



4. Technical Data

Current

Measurement ranges:	± 10 A, ± 30 A, ± 50 A and ± 150 A
Resolution:	1 mA
Accuracy:	1 % plus ± 50 mA (relative to the measuring range)
Output rate:	Max. 2 kHz, configurable
Measurement category:	CAT I
Averaging:	Configurable

CAN-Interface

Type:	ISO 11898-2 (High-speed) CAN protocol Versionen 2.0 A und 2.0 B
Data rate:	High-speed up to 1 Mbit/s
Connector:	4 pol. Lemo 2 x 9 pol. Lemo (Variant M-CAN)

Supply

Power Supply:	9 VDC to 30 VDC
Power consumption:	40 mA at 12 VDC

Environmental conditions

Temperature range:	-40 °C to +120 °C
Protection class:	IP65

General information

Housing:	Robust aluminum housing
Dimensions (LxWxH):	up to 50 A: 59 mm x 32 mm x 17.5 mm up to 50 A: 65 mm x 38 mm x 21.5 mm (Variant M-CAN) 150 A: 68 mm x 36 mm x 17,5 mm 150 A: 68 mm x 36 mm x 21,5 mm (Variant M-CAN)
Cable diameter:	up to 50 A: 6,1 mm 150 A: 11 mm
Weight:	up to 50 A: approx. 60 g up to 50 A: approx. 100 g (Variant M-CAN) 150 A: approx. 80 g 150 A: approx. 120 g (Variant M-CAN)
Factory calibration:	Standard: -20 °C to +110 °C Extended: -40 °C to +120 °C DAkkS calibration on request

5. Document History

Version	Date	Author	Change log
1.0	22.04.2020	PA	Initial Version