



EGM187 VIEWER USERS MANUAL

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1 Introduction

1.1 Purpose

The purpose of this document is to describe how to use the "EGM187 Viewer" application as a tool for calibrating the H&B load cell digital amplifier modules, reading and writing command parameters and monitor weight values measured from the connected modules.

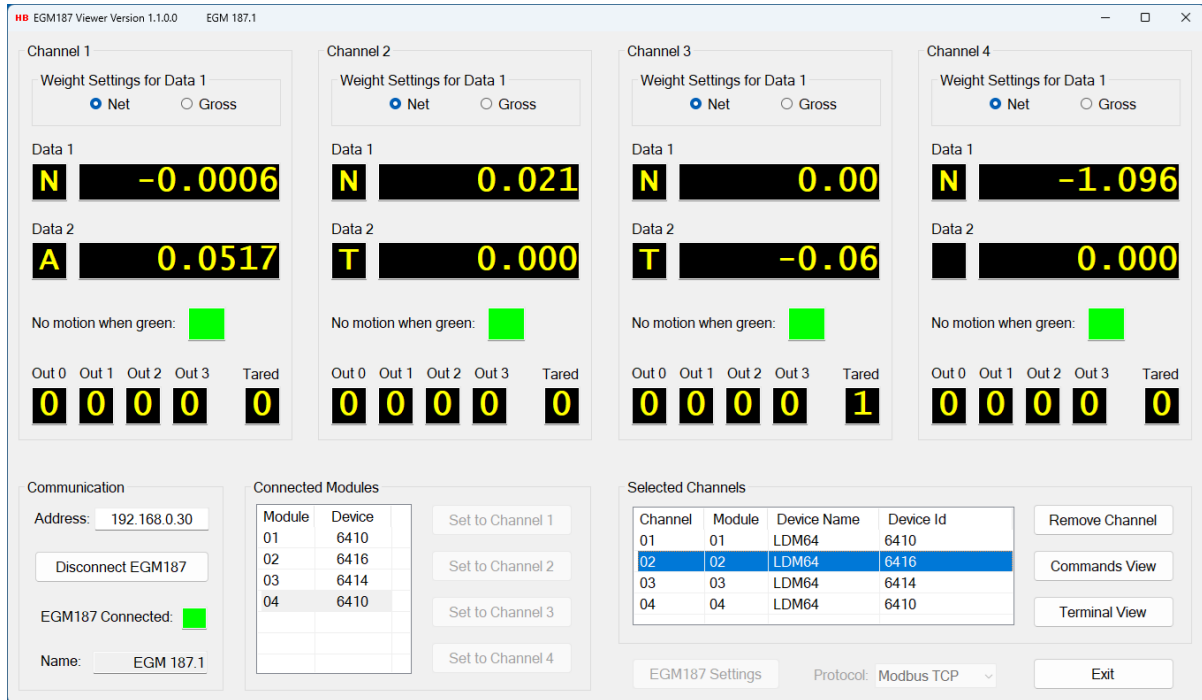
The detailed functionality of the different device command parameters used in the "EGM187 Viewer" application will not be explained in this document. The commands are described in detail in other documents covering the functionalities of the EGM187 device and the different H&B modules.

If you want to do detailed recordings of streamed data from the load cells to a scope containing the graphical representation of the data recorded, please refer to the more advanced DOP 4 application where also the streamed load cell data can be stored for later analysis.

If you use the "Profinet IO" or the "EtherCAT" interface, it's important that a packet capture program called "Npcap" is installed on your computer. You can find the installer for the "Npcap" on the site map "nmap.org/npcap/".

1.2 Overview

The “EGM187 Viewer” application is a tool for calibrating, analyzing and fine-tuning measurement parameters for several of the Hauch & Bach digital amplifier modules for weighing and force measurements connected to a EGM187 device, such as the LDM64.1, and the LDB151.1. All new modules compatible with the EGM187 device will also be supported by the “EGM187 Viewer” application as they are released.



The main page consists of four channel groups from which load cell measurement and command settings can be performed. Calibration and tarring of connected modules can be done from special “Calibration” and “Filter / Tare” dialogs found in the “Commands View” dialog, available for each of the up to four connected modules.

Connected modules are selected in the “EGM187 Viewer” application from the “Connected Modules” group box.

For detailed information on calibration, filtering and command parameters handling, refer to the specific sections covering these issues.

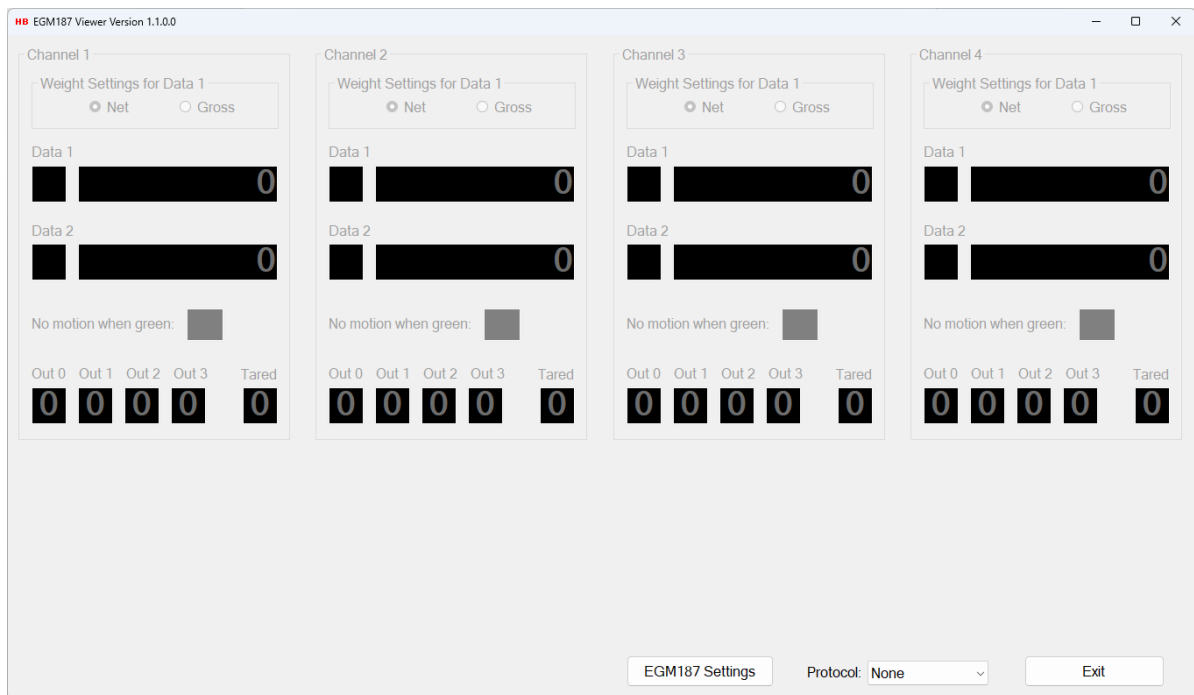
2 Application Startup

The first window which appears after “EGM187 Viewer” application startup is the main window. The main window is quite empty until an EGM187 device is connected to the “EGM187 Viewer”.

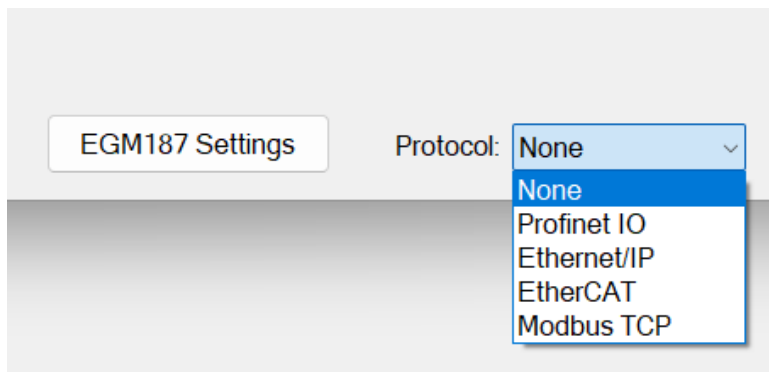
If the connected “EGM187 device” is not yet configured, go the section “Setup the EGM187 device” describing this topic.

When an EGM187 device is connected to the “EGM187 Viewer”, the modules connected to the EGM187 device can be selected one by one in the “Connected Modules” group box and assigned to a given channel box.

It’s important that the EGM187 is not connected to a PLC or another application than the “EGM187 Viewer” application, as the communication between the EGM187 and the “EGM187 Viewer” will not function properly.

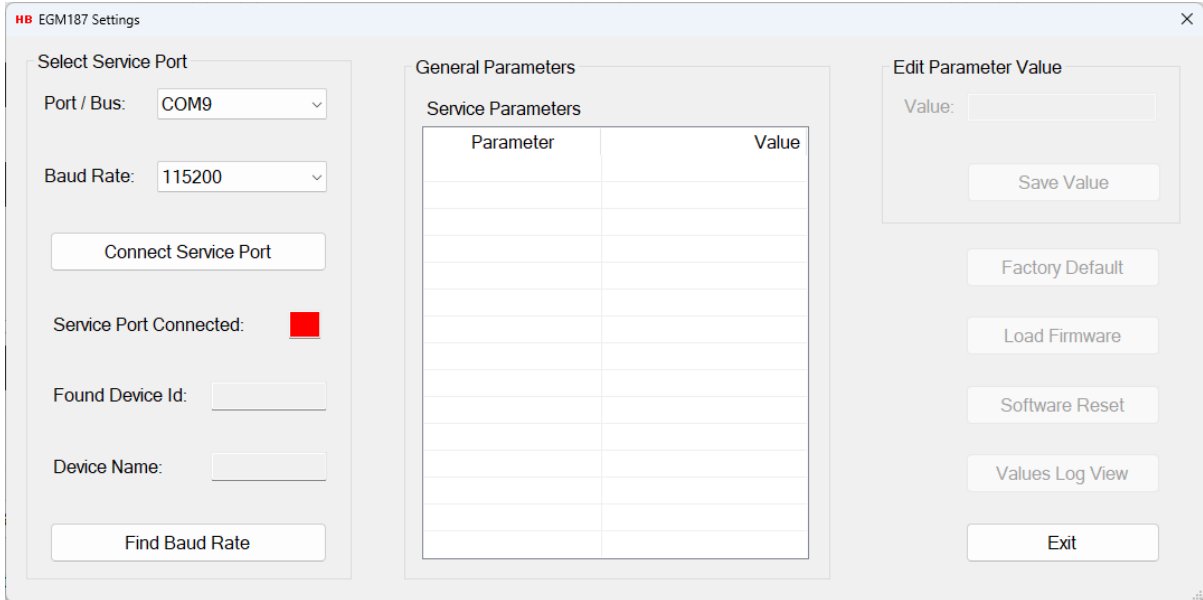
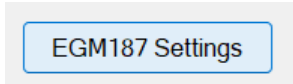


If the currently connected EGM187 device is already configured, then start by selecting one of the four firmware protocols for which the EGM187 device is configured.



2.1 Setup the EGM187 device

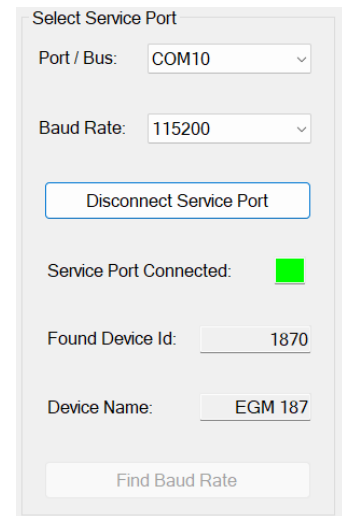
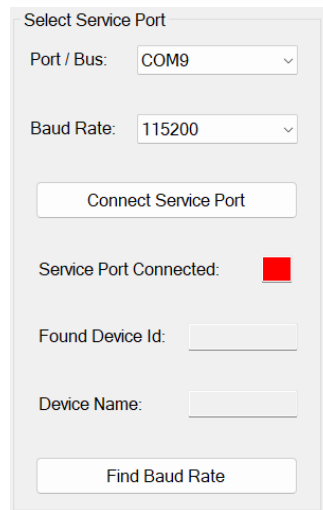
For configuring an EGM187 device select the "EGM187 Settings" button in the main menu, to open the "EGM187 Settings" dialog.



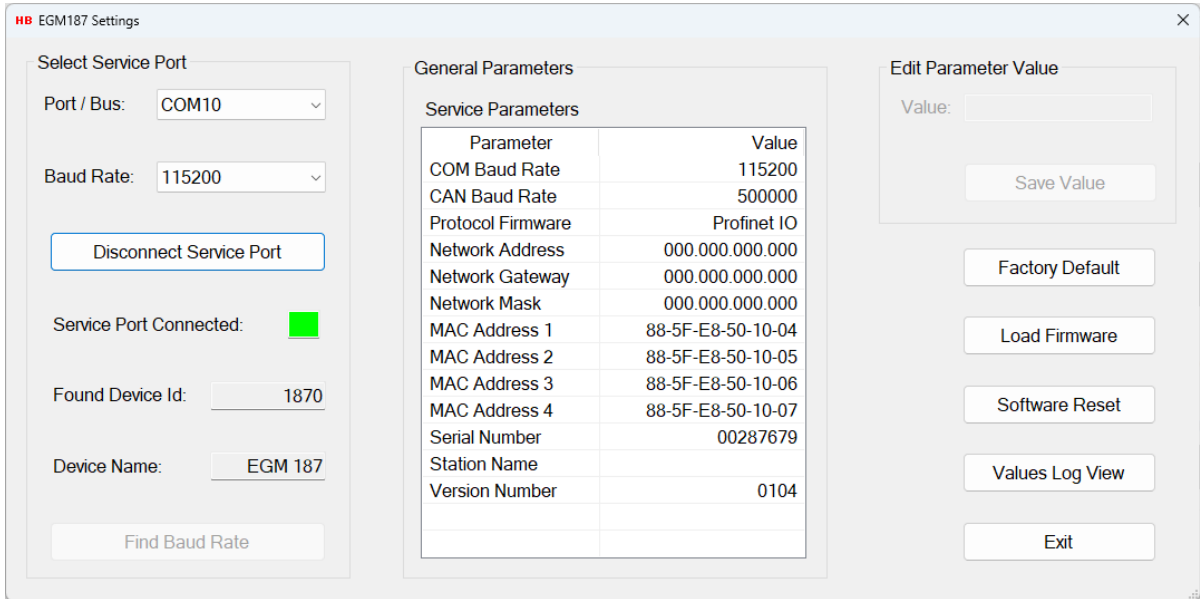
From the "Port / Bus" drop down list, select the serial COM port to which the EGM178 device is connected.

From the "Baud Rate" drop down list, select the correct baud rate for the EGM187 device. If the baud rate is unknown, it can be found by selecting the "Find Baud Rate" button.

Select the "Connect Service Port" button to connect to the EGM187 device and information about the connected EGM187 device together with the current "Service Parameters" will be showed.



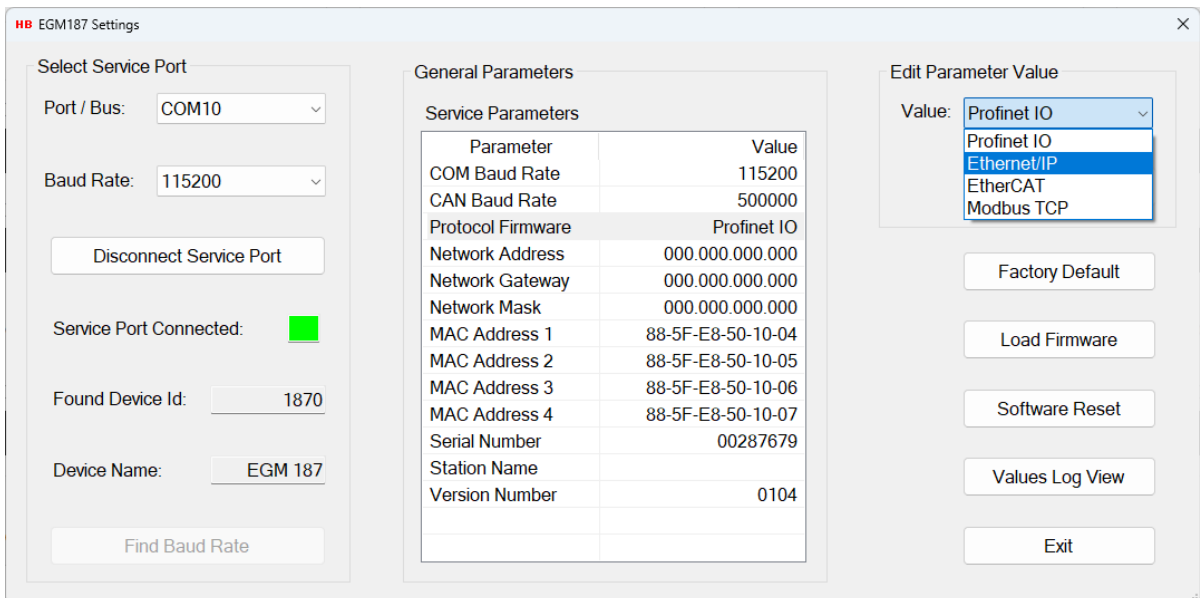
If this is the first time the EGM187 device has been connected, the default service parameters will be shown in the "Service Parameters" list view.



The default "Protocol Firmware" is the "Profinet IO" protocol. If the user wants to change the protocol to another of the four available protocols or edit the parameters for the currently selected protocol, refer to the individual sub sections describing the setup of a given protocol firmware.

The user can change the currently selected firmware protocol by selecting the "Protocol Firmware" line in the "Service Parameters" list view.

The currently selected protocol firmware can now be changed by selecting one of the available values in the dropdown list in the "Edit Parameter Value" group box and then select the "Save Value" button when done.

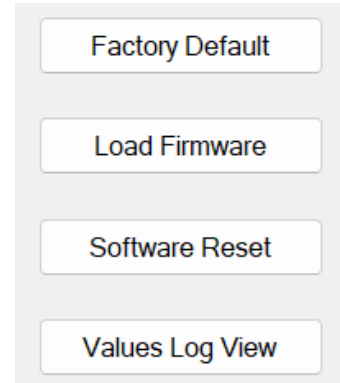


After a few seconds the user can make a "Disconnect Service Port", power the EGM187 off/on and make a reconnect by selecting the "Connect Service Port" button to access the parameters for the currently selected firmware protocol.

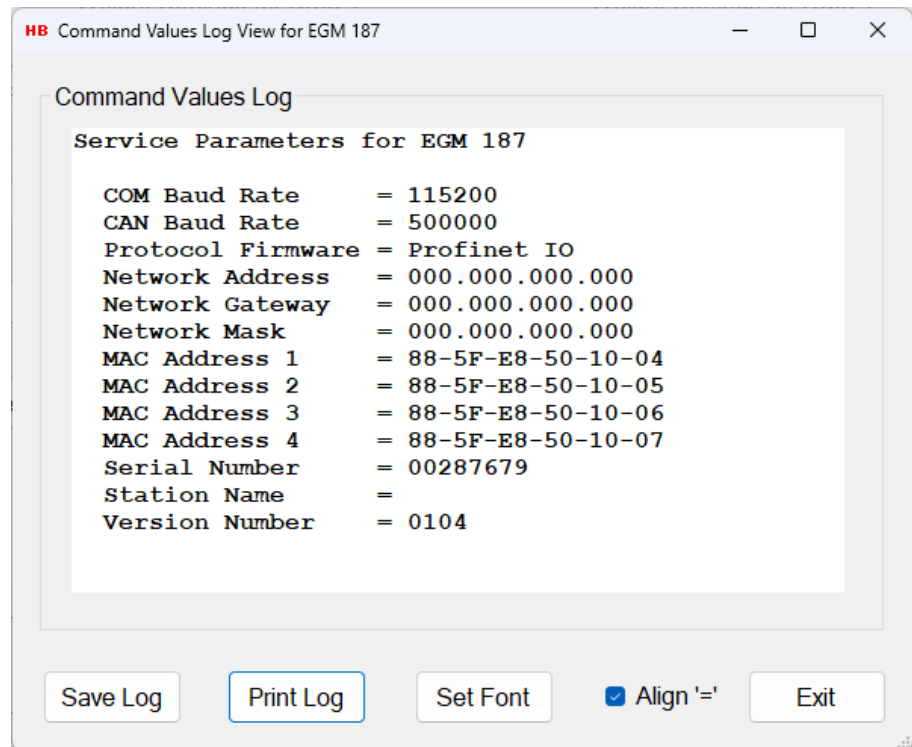
By selecting the "Factory Default" button the EGM187 device will be reset to the factory default settings. After the reset, the EGM187 device must be restarted.

By selecting the "Load firmware" button a new version of the main firmware from the internal flash disk of the EGM187 device will be transferred to the flash memory in the EGM187 micro controller and restart it.

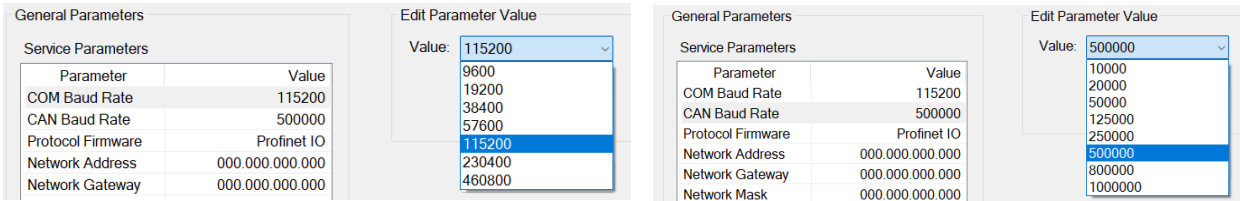
By selecting the "Software Reset" button a complete reset of the EGM187 device will be performed. It has the same functionality as power OFF and ON again.



By selecting the "Values Log View" button, the "Values Log View" dialog for showing the current settings of the EGM187 device, will open with information for the currently connected EGM187. The information can be saved and printed.



For all the four firmware protocols, the “COM Baud Rate” and the “CAN Baud Rate” values can be changed by highlighting them in the “Service Parameters” list view and then selecting one of the available values from the baud rate drop down lists. When done, select the “Save Value” Button.



For the rest of the “Service parameters” it’s different which parameters can be changed. Some are read only and others are writeable. Refer to the individual sub sections describing the setup for a specific firmware protocol.

2.1.1 Set up the Profinet IO protocol

With the “Profinet IO” protocol as the selected firmware protocol in the EGM187, the user can only change the “COM Baud Rate” and the “CAN Baud Rate” values from the “Service Parameters” list view, the rest of the parameters are read only.

The three “Network X” and the “Station Name” parameters must be defined in the “Select Device” dialog for the “Profinet IO” protocol, opened from the main menu by selecting the “Select EGM187” button.

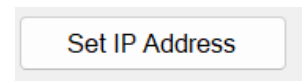
So now leave the “EGM187 Settings” dialog and continue the setup in the “Select Device” dialog accessed from the main dialog. Make sure that the firmware protocol in the “Protocol” field is set to “Profinet IO” and then select the “Select EGM187” button.

From the networks list in the “Select Device” dialog, highlight the relevant network and select the “Select Network” button.

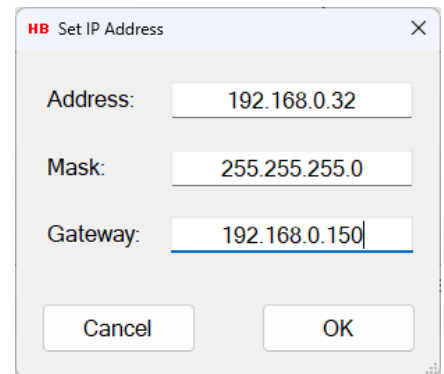
If an EGM187 device is correctly connected to the selected network, this and other available EGM187 devices should now appear in the “Found Devices” list.

Found Devices					
Index	Device Name	Device Id	MAC Address	Station Name	IP Address
01	EGM 187_1	1870	885FE8501004		0.0.0.0

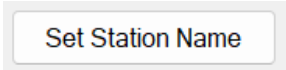
Highlight the preferred found device and select the “Set IP Address” button.



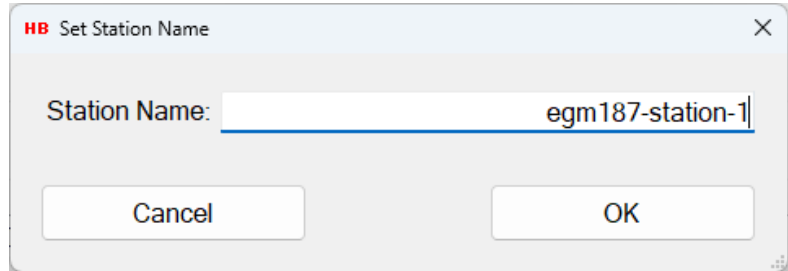
Enter the values for the three network addresses and select the “OK” button to confirm the addresses setup.



Now select the "Set Station Name" button if a station name is to be set. The "Set Station Name" dialog will be opened.



Enter the station name and select the "OK" button to confirm the name setup.



Found Devices

Index	Device Name	Device Id	MAC Address	Station Name	IP Address
01	EGM 187_1	1870	885FE8501004	egm187-station-1	192.168.0.32

Now select the highlighted device by selecting the "Select Device" button and exit the dialog by selecting the "OK" button.



For the full description of "Select Device" dialog for the "Profinet IO" protocol, refer to section "Select Device" for "Profinet IO" protocol.

The user can now reenter the "EGM187 Settings" dialog for examine the final setup results or start using the EGM187 device with the connected modules right away. Refer to section covering the assignment of modules to channels.

Below is an example of a modified service parameter list for the Profinet IO firmware protocol.

Default:

Service Parameters	
Parameter	Value
COM Baud Rate	115200
CAN Baud Rate	500000
Protocol Firmware	Profinet IO
Network Address	000.000.000.000
Network Gateway	000.000.000.000
Network Mask	000.000.000.000
MAC Address 1	88-5F-E8-50-10-04
MAC Address 2	88-5F-E8-50-10-05
MAC Address 3	88-5F-E8-50-10-06
MAC Address 4	88-5F-E8-50-10-07
Serial Number	00287679
Station Name	
Version Number	0104

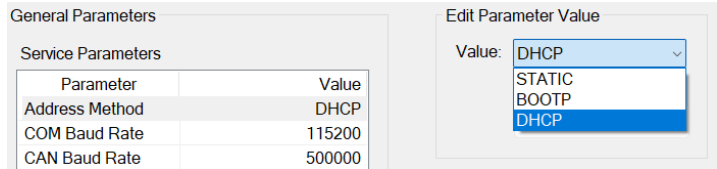
Modified:

Service Parameters	
Parameter	Value
COM Baud Rate	115200
CAN Baud Rate	500000
Protocol Firmware	Profinet IO
Network Address	192.168.000.032
Network Gateway	192.168.000.150
Network Mask	255.255.255.000
MAC Address 1	88-5F-E8-50-10-04
MAC Address 2	88-5F-E8-50-10-05
MAC Address 3	88-5F-E8-50-10-06
MAC Address 4	88-5F-E8-50-10-07
Serial Number	00287679
Station Name	egm187-station-1
Version Number	0104

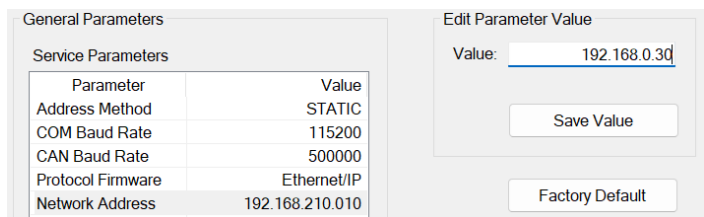
2.1.2 Set up the Ethernet/IP protocol

With the "Ethernet/IP" protocol as the selected firmware protocol in the EGM187, the user can beside of changing the "COM Baud Rate" and the "CAN Baud Rate" values from the "Service Parameters" list view, also change the "Address Method" and the three "Network X" parameters.

The "Adress Method" can be changed by selecting it in the "Service Parameters" list view and then selecting one of the available values from the value drop down list. When done, select the "Save Value" Button. The "Address Method" is default set to "DHCP" but are often changed to "Static".



To change the three "Network X" parameters, select the network items one by one from the "Service Parameters" list view, modify the values in the "Value" field. When done, select the "Save Value" field.



Below is an example of a modified service parameter list for the Ethernet/IP firmware protocol.

Default:

Parameter	Value
Address Method	DHCP
COM Baud Rate	115200
CAN Baud Rate	500000
Protocol Firmware	Ethernet/IP
Network Address	192.168.210.010
Network Gateway	000.000.000.000
Network Mask	255.255.255.000
MAC Address 1	88-5F-E8-50-10-04
MAC Address 2	88-5F-E8-50-10-05
MAC Address 3	88-5F-E8-50-10-06
MAC Address 4	88-5F-E8-50-10-07
Serial Number	00287679
Version Number	0104

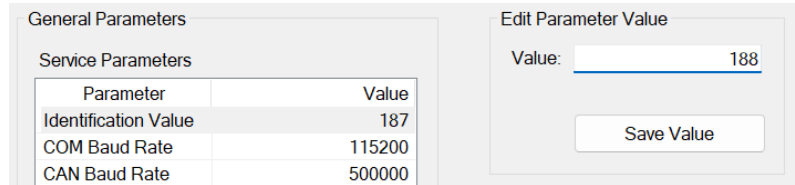
Modified:

Parameter	Value
Address Method	STATIC
COM Baud Rate	115200
CAN Baud Rate	500000
Protocol Firmware	Ethernet/IP
Network Address	192.168.000.030
Network Gateway	192.168.000.150
Network Mask	255.255.255.000
MAC Address 1	88-5F-E8-50-10-04
MAC Address 2	88-5F-E8-50-10-05
MAC Address 3	88-5F-E8-50-10-06
MAC Address 4	88-5F-E8-50-10-07
Serial Number	00287679
Version Number	0104

2.1.3 Set up the EtherCAT protocol.

With the “EtherCAT” protocol as the selected firmware protocol in the EGM187, the user can beside of changing the “COM Baud Rate” and the “CAN Baud Rate” values from the “Service Parameters” list view, also change the “Identification Value”.

To change the “Identification Value” parameter, select the “Identification Value” item from the “Service Parameters” list view. Modify the value in the “Value” field and select the “Save Value” field when done.



Below is an example of a modified service parameter list for the EtherCAT firmware protocol.

Default:

Service Parameters	
Parameter	Value
Identification Value	0
COM Baud Rate	115200
CAN Baud Rate	500000
Protocol Firmware	EtherCAT
MAC Address 1	88-5F-E8-50-10-04
MAC Address 2	88-5F-E8-50-10-05
MAC Address 3	88-5F-E8-50-10-06
MAC Address 4	88-5F-E8-50-10-07
Serial Number	00287679
Version Number	0104

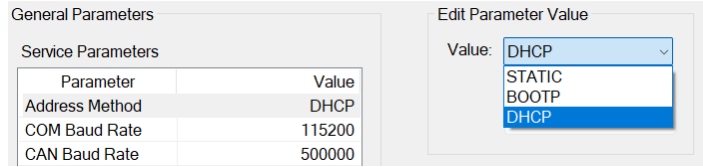
Modified:

Service Parameters	
Parameter	Value
Identification Value	187
COM Baud Rate	115200
CAN Baud Rate	500000
Protocol Firmware	EtherCAT
MAC Address 1	88-5F-E8-50-10-04
MAC Address 2	88-5F-E8-50-10-05
MAC Address 3	88-5F-E8-50-10-06
MAC Address 4	88-5F-E8-50-10-07
Serial Number	00287679
Version Number	0104

2.1.4 Set up the Modbus TCP protocol.

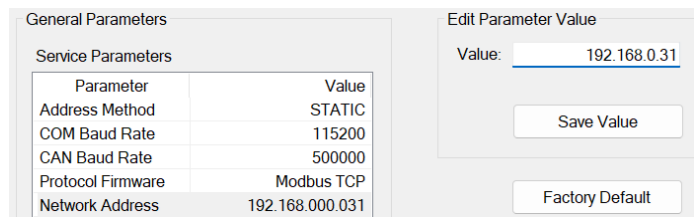
With the “Modbus TCP” protocol as the selected firmware protocol in the EGM187, the user can beside of changing the “COM Baud Rate” and the “CAN Baud Rate” values from the “Service Parameters” list view, also change the “Address Method” and the three “Network X” parameters.

The “Adress Method” can be changed by selecting it in the “Service Parameters” list view and then selecting one of the available values from the value drop down list. Select the “Save Value” Button when done.



The “Address Method” is default set to “DHCP” but are often changed to “Static”.

To change the three “Network X” parameters, select the network items one by one from the “Service Parameters” list view. Modify the values in the “Value” field and select the “Save Value” field when done.



Below is an example of a modified service parameter list for the Modbus TCP firmware protocol.

Default:

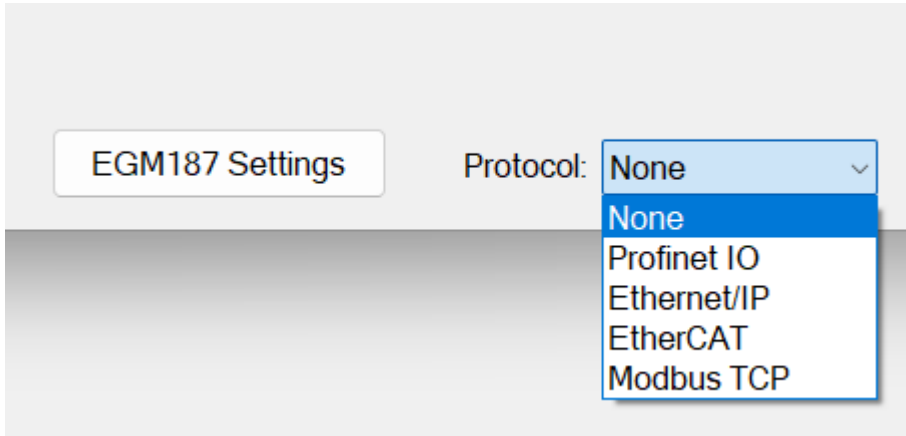
Service Parameters	
Parameter	Value
Address Method	DHCP
COM Baud Rate	115200
CAN Baud Rate	500000
Protocol Firmware	Modbus TCP
Network Address	000.000.000.000
Network Gateway	000.000.000.000
Network Mask	000.000.000.000
MAC Address 1	88-5F-E8-50-10-04
MAC Address 2	88-5F-E8-50-10-05
MAC Address 3	88-5F-E8-50-10-06
MAC Address 4	88-5F-E8-50-10-07
Serial Number	00287679
Version Number	0104

Modified:

Service Parameters	
Parameter	Value
Address Method	STATIC
COM Baud Rate	115200
CAN Baud Rate	500000
Protocol Firmware	Modbus TCP
Network Address	192.168.000.031
Network Gateway	192.168.000.150
Network Mask	255.255.255.000
MAC Address 1	88-5F-E8-50-10-04
MAC Address 2	88-5F-E8-50-10-05
MAC Address 3	88-5F-E8-50-10-06
MAC Address 4	88-5F-E8-50-10-07
Serial Number	00287679
Version Number	0104

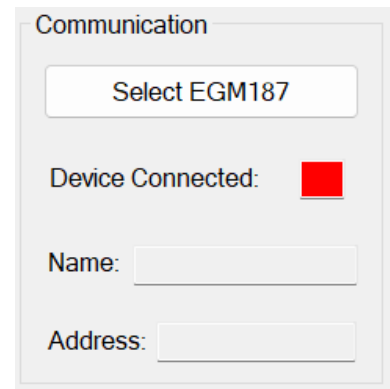
2.2 Select the firmware protocol

From the "Protocol" drop down list, one of the available firmware protocols can be selected for further communication.

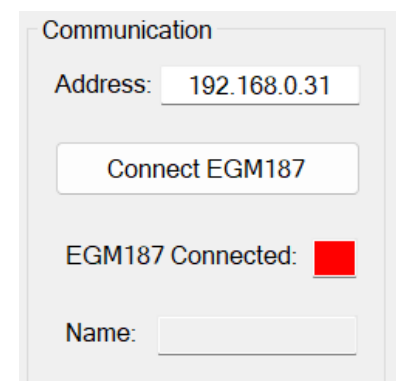


Depending on the selected firmware protocol, the "Communication" group box will have a different appearance.

If the "Profinet IO" or the "EtherCAT" protocol is selected, the "Communication" group box will have the appearance as shown to the right. To establish the communication with an EGM187 device, the EGM187 must be selected from a separate "Select Device" dialog opened by selecting the "Select EGM187" button.



If the "Ethernet/IP" or the "Modbus TCP" protocol is selected, the "Communication" group box will have the appearance as shown to the right. To establish the communication with an EGM187 device, the correct IP address must be entered in the "Address" field, and the communication will be established by selecting the "Connect EGM187" button.

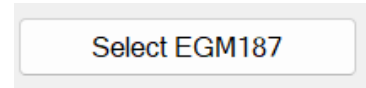


2.3 Connect to the EGM187 device

From the "Communication" group box, the connection of an EGM187 device to the "EGM187 Viewer" is performed. The connection procedure is a bit different depending on the selected firmware protocol.

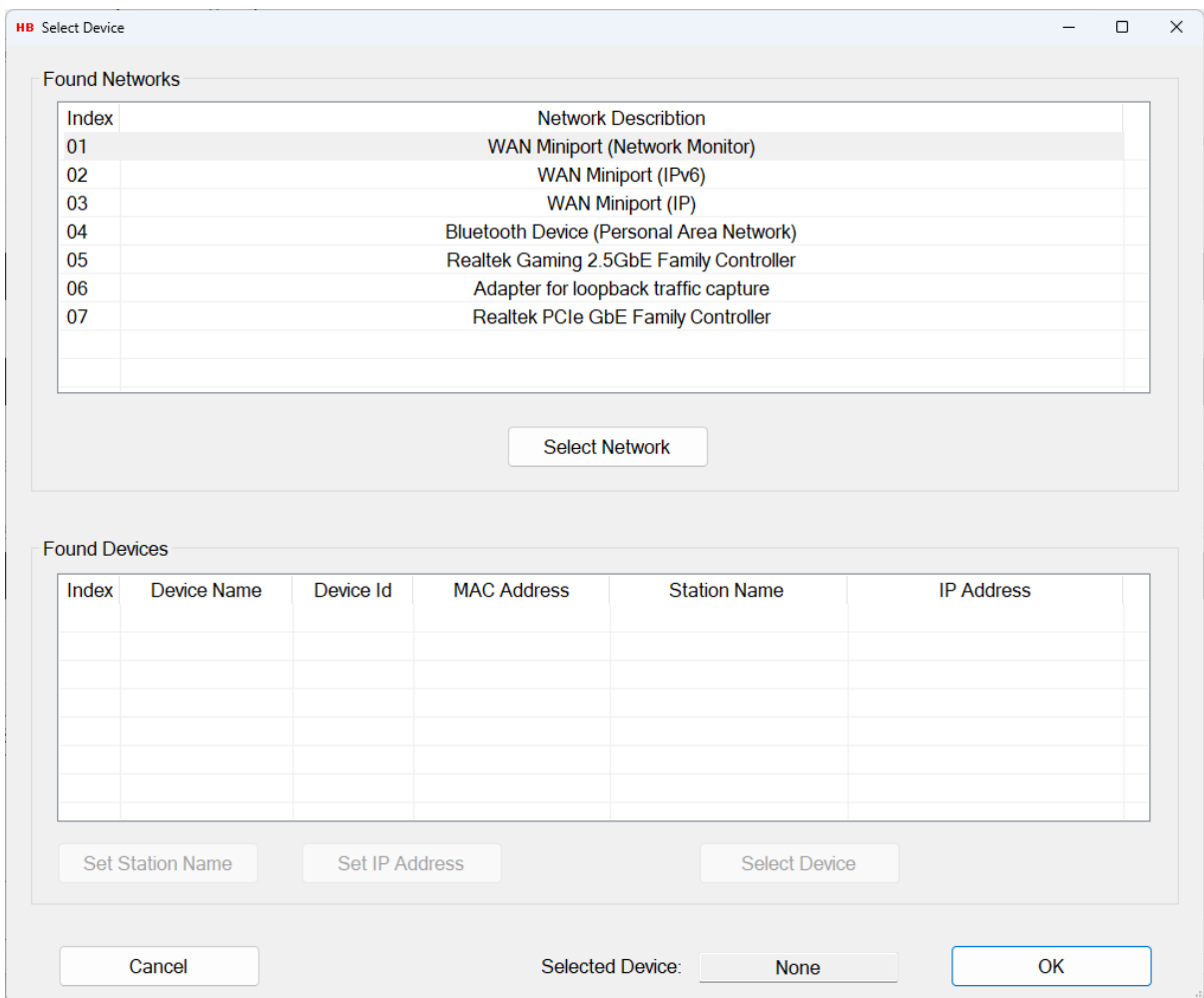
2.3.1 Connect to the EGM187 device with the Profinet IO protocol selected

To establish the communication with an EGM187 device having the Profinet IO protocol firmware selected, the "Select Device" dialog must be opened by selecting the "Select EGM187" button.

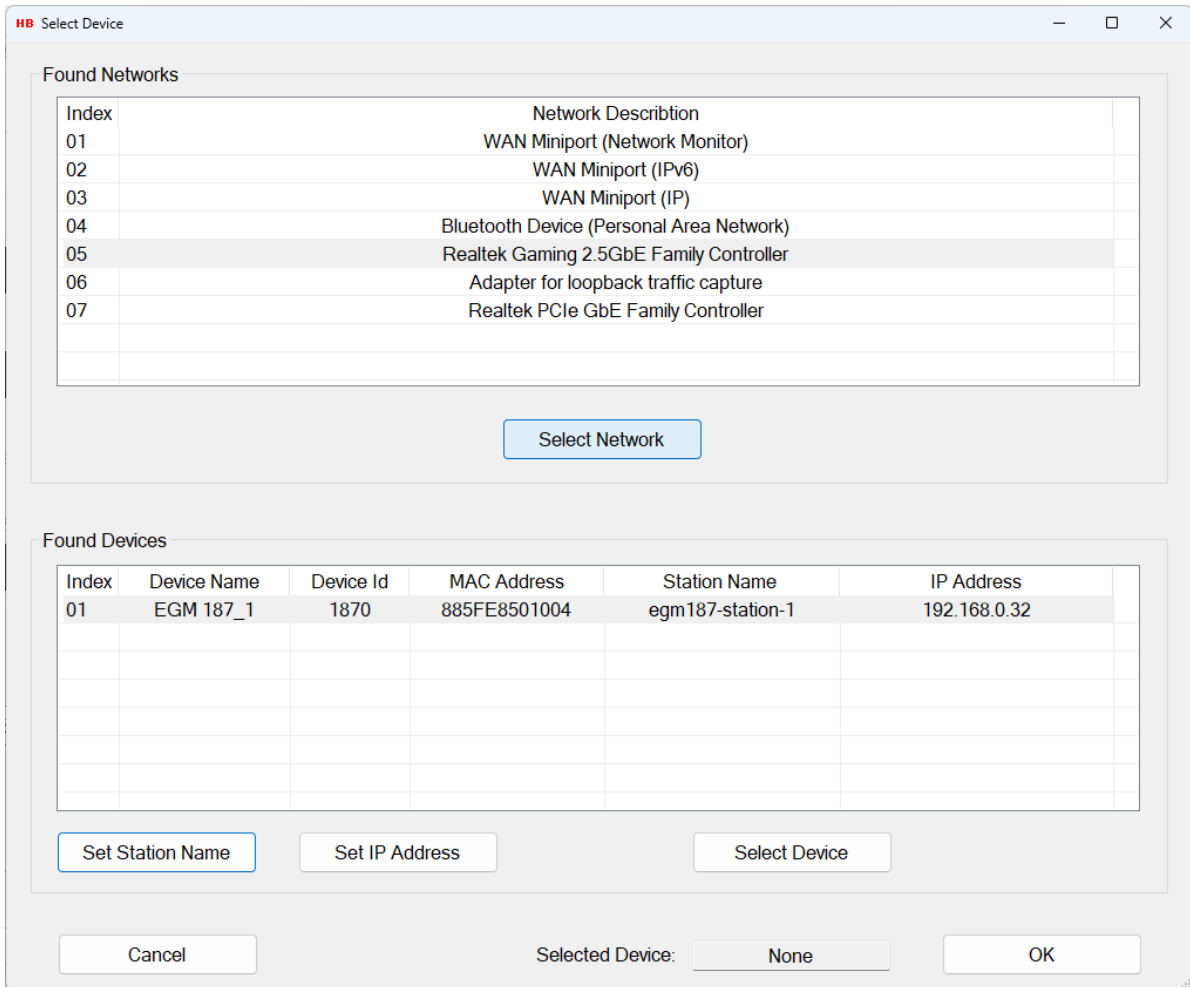


It's assumed that the EGM187 device previously has been setup correctly with definition of the IP addresses and the station name.

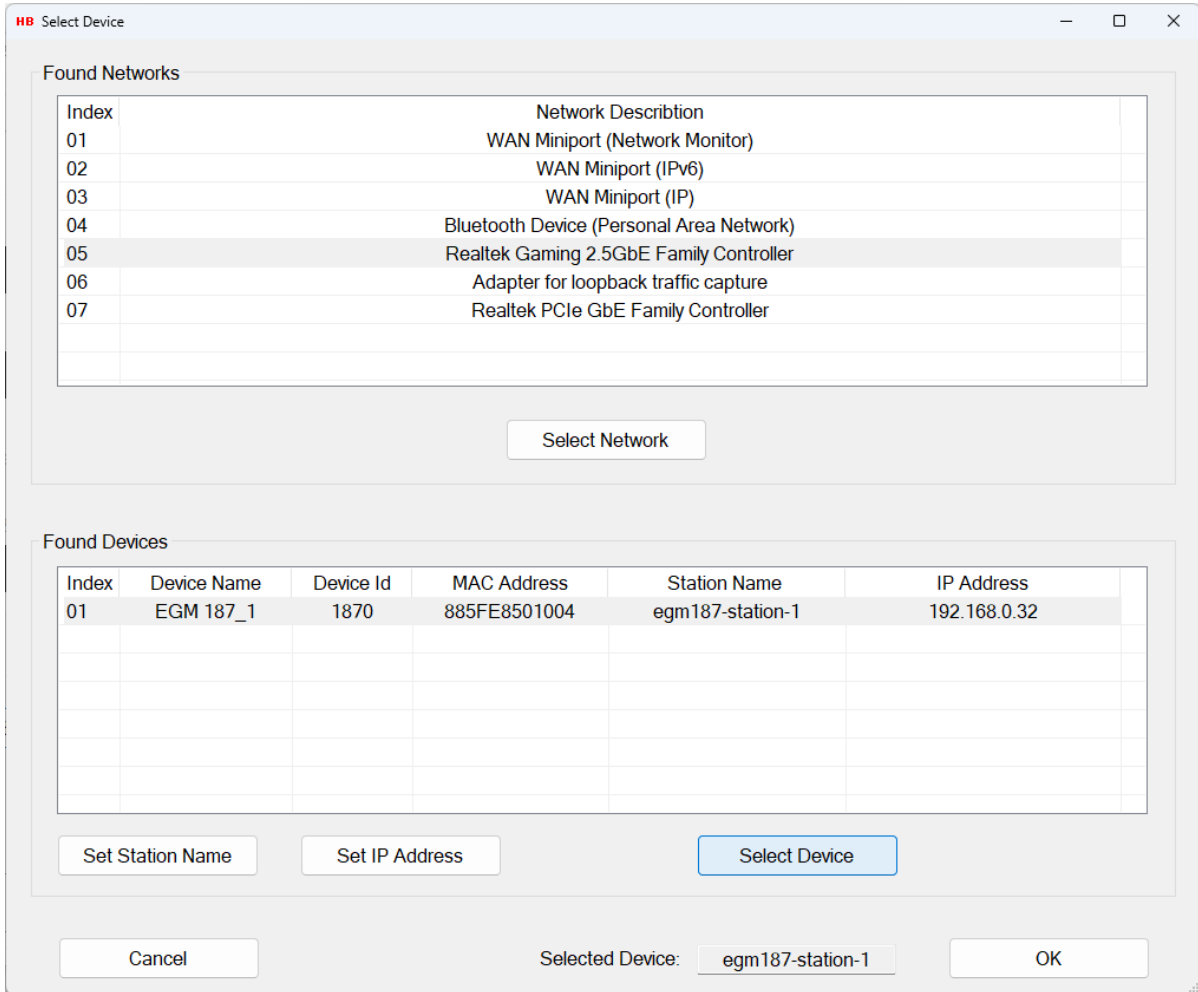
After the "Select Device" dialog for Profinet IO is opened, highlight the preferred network from the "Found Networks" list and select the "Select Networks" button.



After a network is selected, all the EGM187 devices found on the selected network will be shown in the "Found Devices" list box.

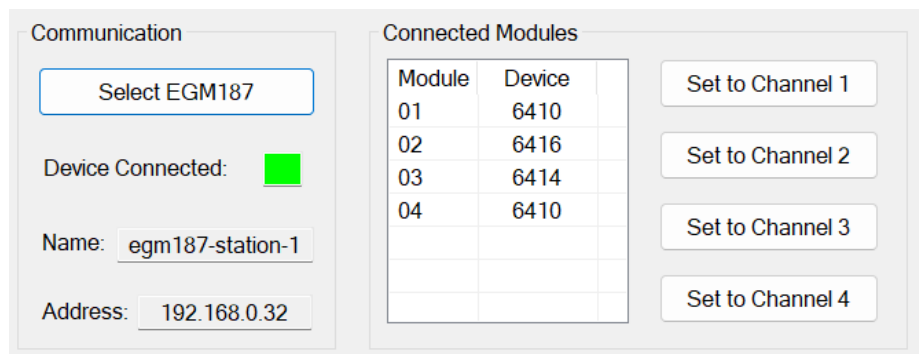


Highlight one of the shown EGM187 devices and select the "Select Device" button. The station name of the selected EGM187 device, will now be shown in the "Selected Device" field.



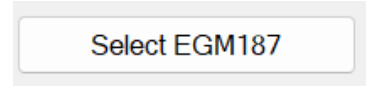
Select the "OK" button to exit to the main menu.

The "Communication" group box is now updated with the relevant information about the selected EGM187 device. The modules connected to the selected EGM187 device, should now be shown in the "Connected Modules" group box.

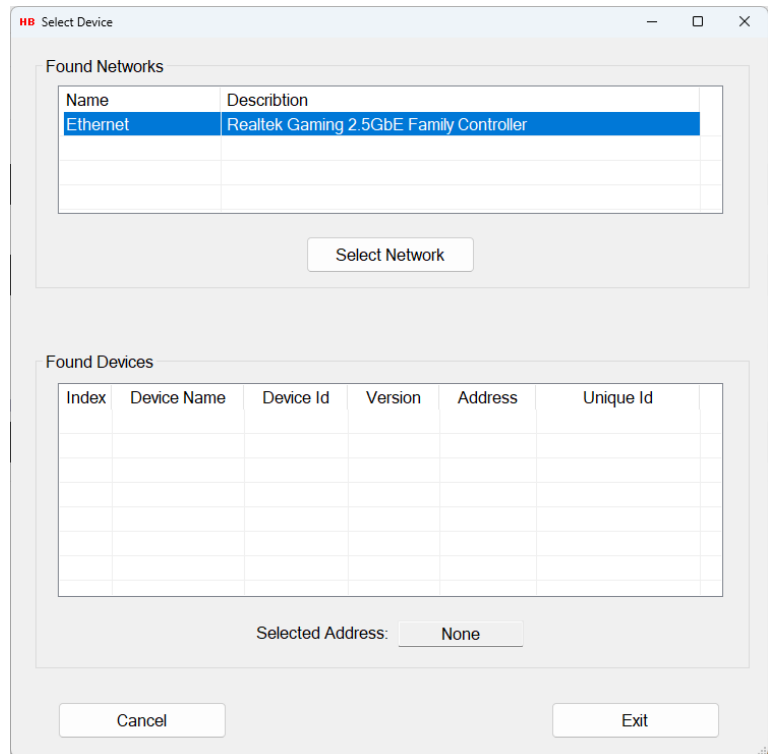


2.3.1 Connect to the EGM187 device with the EtherCAT protocol selected

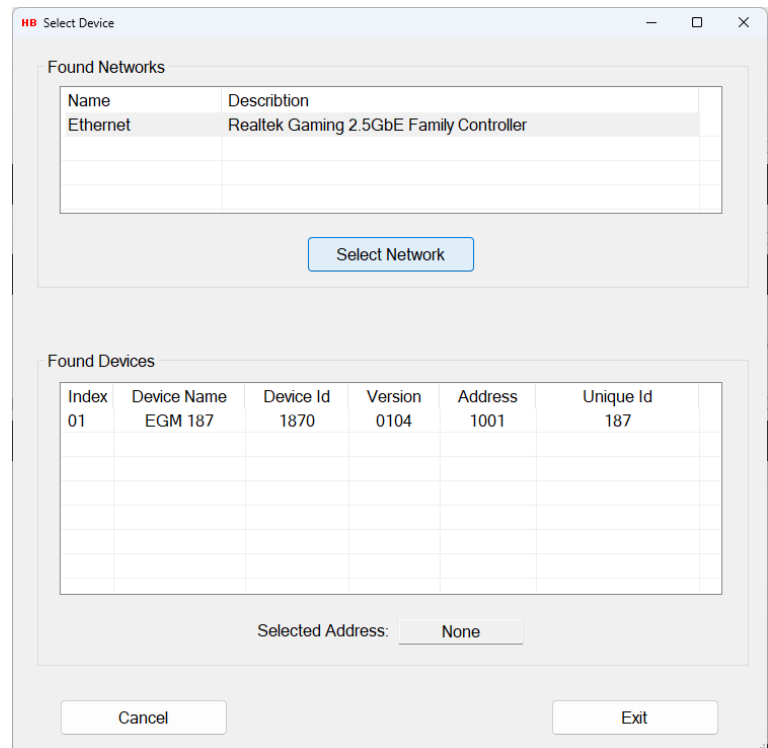
To establish the communication with an EGM187 device having the EtherCAT protocol firmware selected, the "Select Device" dialog must be opened by selecting the "Select EGM187" button.



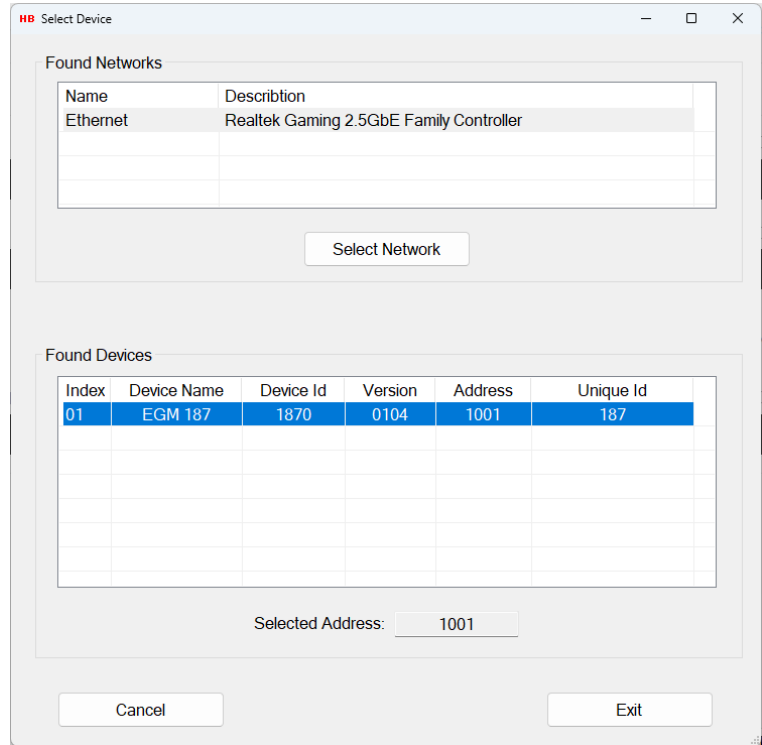
After the "Select Device" dialog for EtherCAT is opened, highlight the preferred network from the "Found Networks" list and select the "Select Network" button.



After a network is selected, all EGM187 devices found on the selected network will be shown in the "Found Devices" list box.

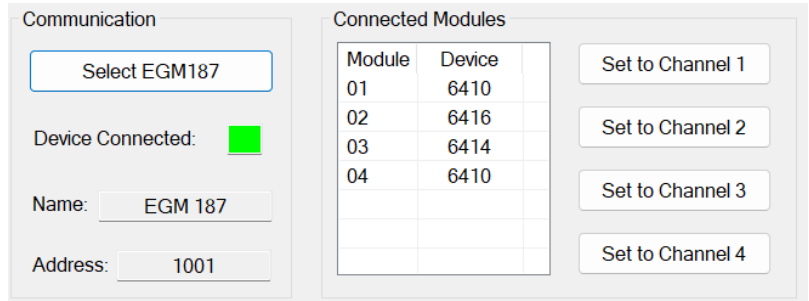


Highlight one of the shown EGM187 devices and it will appear as the currently selected device, with its name shown in the "Selected Device" field.



Select the "OK" button to exit to the main menu.

The "Communication" group box is now updated with the relevant information about the selected EGM187 device. The modules connected to the selected EGM187 device, should now be shown in the "Connected Modules" group box.



2.3.2 Connect with the Ethernet/IP or the Modbus TCP protocol selected

To establish the communication with an EGM187 device having the "Ethernet/IP" or the "Modbus TCP" protocol firmware selected, enter the valid IP address assigned to the EGM187 device in the "Address" field and select the "Connect EGM187" button to establish the connection.

Communication

Address:

EGM187 Connected: ■

Name:

Communication

Address:

EGM187 Connected: ■

Name:

The "Communication" group box is now updated with the relevant information about the connected EGM187 device.
 The available modules connected to the selected EGM187 device, should now be shown in the "Connected Modules" group box.

Communication

Address:

EGM187 Connected: ■

Name:

Connected Modules

Module	Device
01	6410
02	6416
03	6414
04	6410

2.4 Assign connected modules to channels

To communicate with one of the connected modules of the EGM187 device, from the "Connected Modules" group box, select one of the modules in the modules list view and assign it to one of the four available module channels by selecting one of the four "Set to Channel x" buttons.

Module	Device
01	6410
02	6416
03	6414
04	6410

Channel	Module	Device Name	Device Id

Module	Device
01	6410
02	6416
03	6414
04	6410

Channel	Module	Device Name	Device Id
01	01	LDM64	6410

The selected module will be added to the "Selected Channels" list view from which it can be removed again by selecting the "Remove Channel" button.

The two buttons "Commands View" and "Terminal View" will be enabled and the dialogs belonging to these buttons can now be opened. Refer to the sections describing the functionality of these dialogs.

The ongoing cycle data transfer for the selected module can be monitored in the channel box to which the selected module is assigned.

Channel 1

Weight Settings for Data 1
 Net Gross

Data 1
N **1.000**

Data 2
A **2.278**

No motion when green: ■

Out 0 Out 1 Out 2 Out 3 Tared
1 **0** **0** **0** **0**

The user can assign up to four modules to the four available channels. A given module can only be assigned to one channel at the time.

The screenshot shows the 'Connected Modules' and 'Selected Channels' sections. The 'Connected Modules' table lists four modules with their respective device IDs. The 'Selected Channels' table shows the current assignment of modules to channels.

Module	Device
01	6410
02	6416
03	6414
04	6410

Channel	Module	Device Name	Device Id
02	01	LDM64	6410
03	04	LDM64	6410

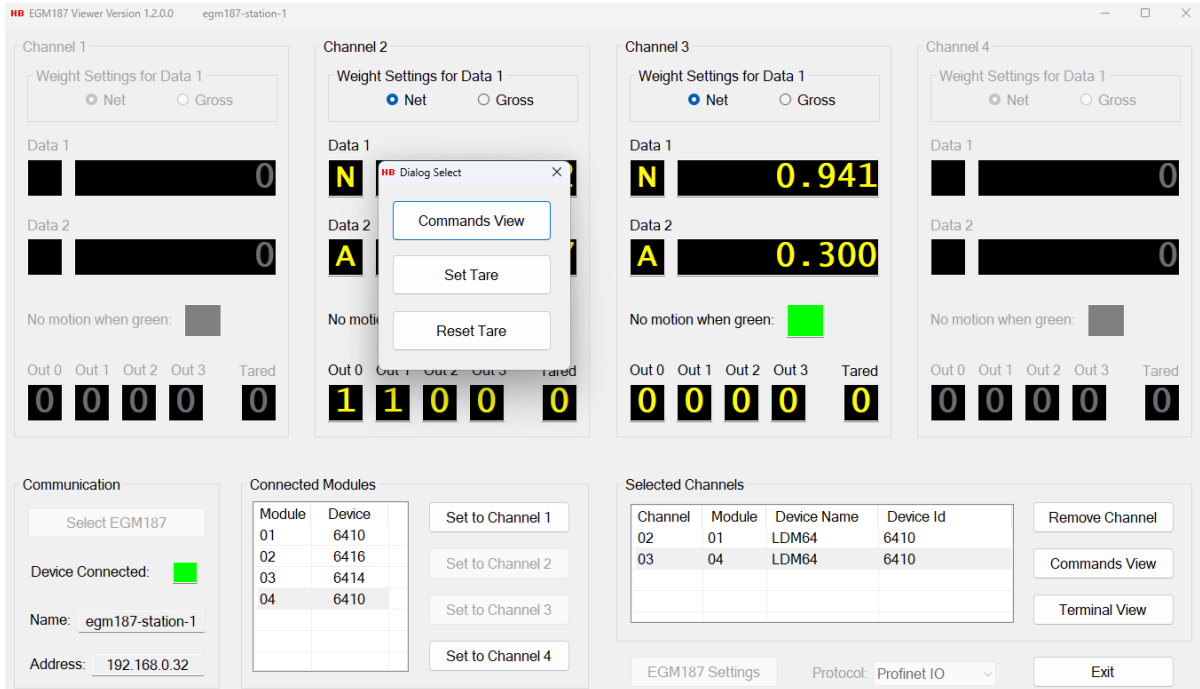
It's up to the user to decide which of the available modules should be assigned to a given channel by choice.

The screenshot displays the main interface with four channel panels (Channel 1 to Channel 4). Each panel shows weight settings for Data 1 and Data 2, and output status for Out 0 to Out 3 and Tared. Channel 2 and 3 show active data and outputs.

Channel	Data 1	Data 2	Out 0	Out 1	Out 2	Out 3	Tared
Channel 1	0	0	0	0	0	0	0
Channel 2	N 1.7452	A 0.8957	1	1	0	0	0
Channel 3	N 0.941	A 0.300	0	0	0	0	0
Channel 4	0	0	0	0	0	0	0

2.5 Dialog shortcuts

Every time the cursor is moved over one of the active weight displays in a “Channel X” group box, the “Dialog Select” popup menu will appear.

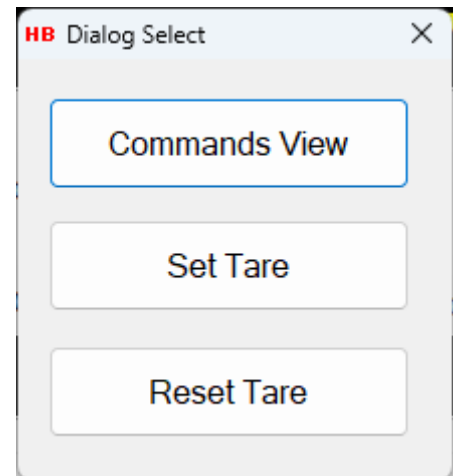


2.5.1 Dialog Select

From the “Dialog Select” menu it’s possible to access the “Commands View” dialog for the module assigned to the channel for which the “Dialog Select” menu has been opened by selecting the “Commands View” button.

By selecting the “Set Tare” button, a taring of the module assigned to the selected channel will be performed.

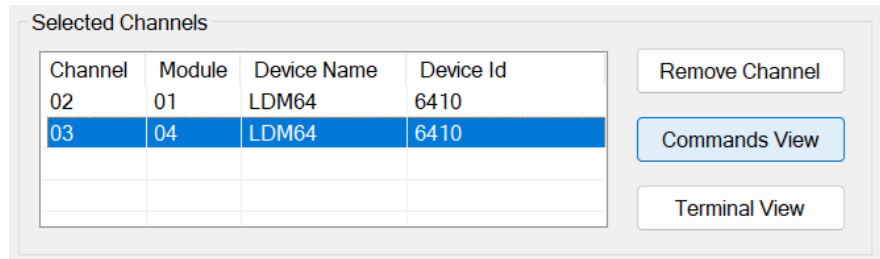
By selecting the “Reset Tare” button, the taring of the module assigned to the selected channel will be reset.



3 Commands View

The "Commands View" dialog is selected from the popup menu opened from one of the four module channel group boxes by selecting the "Commands View" button of the opened "Dialog Select" menu.

The "Commands View" dialog can also be opened from the "Selected Channels" group box by highlighting one of the selected channels in the list view and then select the "Commands View" button.

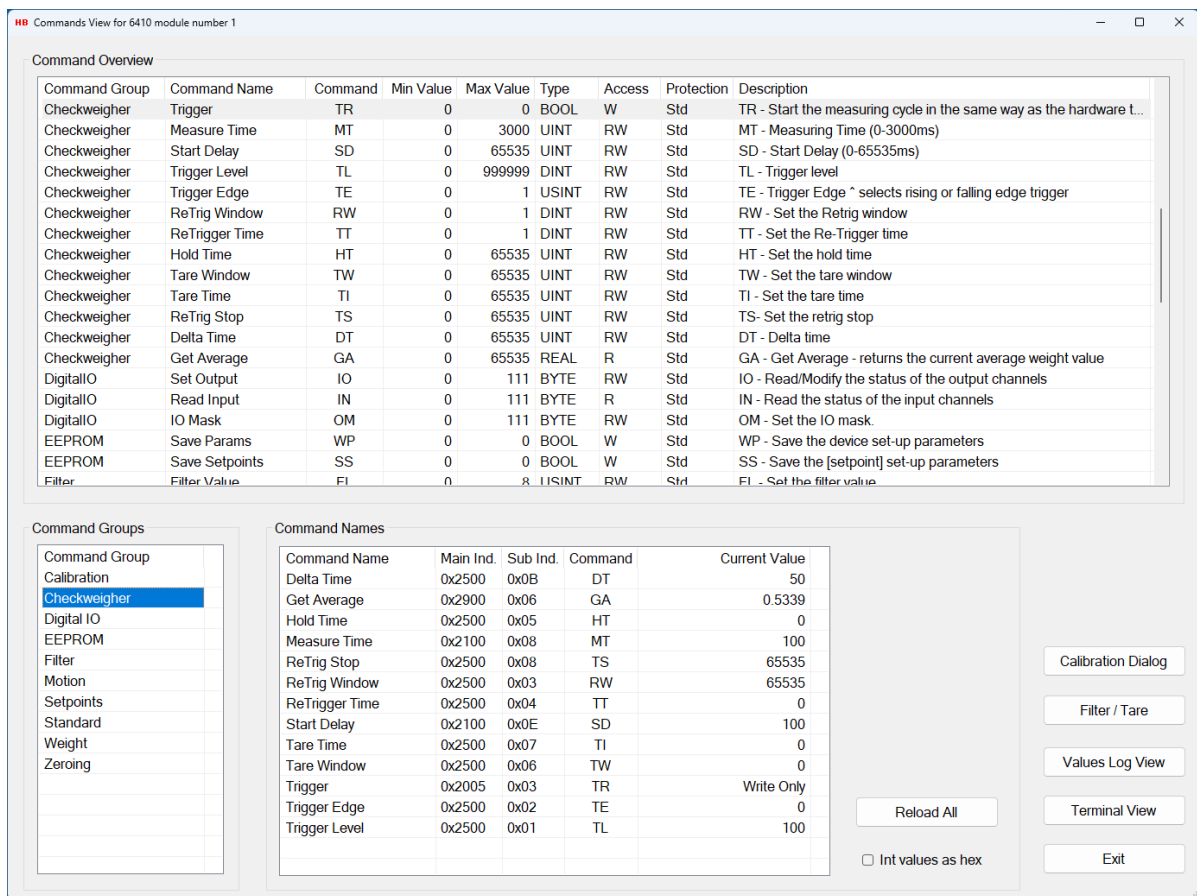


In the "Commands View" dialog the command parameters valid for the currently selected module can be examined.

If a command parameter is writeable, it's also possible to change the current value of the command parameter.

Not all the available command parameters in the different command groups are represented in the "Commands View" dialog, such as the commands performing data streaming when they are called, like SN and SG, but most of the relevant and editable commands are represented.

Use the Terminal View for access of special command parameters not supported by the "Commands View".



3.1 Command Overview

In the "Command Overview" list view, all the commands for the available command groups are listed.

The main characteristic and functionality description for each command can be found in this list.

Not all available commands are represented in the "Command Overview" list view, such as the streaming commands SN and SG as mentioned earlier.

By clicking on a command description in the "Command Overview" list view, the command group to which the command belongs will be highlighted in the "Command Group" list view.

All the commands belonging to the highlighted command group will be listed in the "Command Names" list view. The selected command will also be highlighted in the "Command Names" list view.

Command Group	Command Name	Command	Min Value	Max Value	Type	Access	Protection	Description
Checkweigher	Trigger	TR	0	0	BOOL	W	Std	TR - Start the measuring cycle in the same way as the hardware t...
Checkweigher	Measure Time	MT	0	3000	UINT	RW	Std	MT - Measuring Time (0-3000ms)
Checkweigher	Start Delay	SD	0	65535	UINT	RW	Std	SD - Start Delay (0-65535ms)
Checkweigher	Trigger Level	TL	0	999999	DINT	RW	Std	TL - Trigger level
Checkweigher	Trigger Edge	TE	0	1	USINT	RW	Std	TE - Trigger Edge ^ selects rising or falling edge trigger
Checkweigher	ReTrig Window	RW	0	1	DINT	RW	Std	RW - Set the Retrig window
Checkweigher	ReTrigger Time	TT	0	1	DINT	RW	Std	TT - Set the Re-Trigger time
Checkweigher	Hold Time	HT	0	65535	UINT	RW	Std	HT - Set the hold time
Checkweigher	Tare Window	TW	0	65535	UINT	RW	Std	TW - Set the tare window
Checkweigher	Tare Time	TI	0	65535	UINT	RW	Std	TI - Set the tare time
Checkweigher	ReTrig Stop	TS	0	65535	UINT	RW	Std	TS - Set the retrig stop
Checkweigher	Delta Time	DT	0	65535	UINT	RW	Std	DT - Delta time
Checkweigher	Get Average	GA	0	65535	REAL	R	Std	GA - Get Average - returns the current average weight value
DigitalIO	Set Output	IO	0	111	BYTE	RW	Std	IO - Read/Modify the status of the output channels
DigitalIO	Read Input	IN	0	111	BYTE	R	Std	IN - Read the status of the input channels
DigitalIO	IO Mask	OM	0	111	BYTE	RW	Std	OM - Set the IO mask.
EEPROM	Save Params	WP	0	0	BOOL	W	Std	WP - Save the device set-up parameters
EEPROM	Save Setpoints	SS	0	0	BOOL	W	Std	SS - Save the [setpoint] set-up parameters
Filter	Filter Value	FI	0	8	USINT	RW	Std	FI - Set the filter value

3.2 Command Groups

By clicking on a command group description in the "Command Groups" list view, the selected command group will be highlighted and all the commands belonging to the highlighted command group will be listed in the "Command Names" list view.

The first command in the selected command group will also be highlighted in the "Command Overview" list view.

Command Group	
Calibration	
Checkweigher	
Digital IO	
EEPROM	
Filter	
Motion	
Setpoints	
Standard	
Weight	
Zeroing	

3.3 Command Names

The "Command Names" list view contains all the commands belonging to the currently selected command group.

If a command parameter is readable, the current value of the command parameter will be displayed in the "Current Value" field of the "Command Names" list view.

By selecting the "Reload All" button, all the readable command parameter values will be reloaded from the selected module.

Command Names

Command Name	Main Ind.	Sub Ind.	Command	Current Value
Delta Time	0x2500	0x0B	DT	50
Get Average	0x2900	0x06	GA	0.5339
Hold Time	0x2500	0x05	HT	0
Measure Time	0x2100	0x08	MT	100
ReTrig Stop	0x2500	0x08	TS	65535
ReTrig Window	0x2500	0x03	RW	65535
ReTrigger Time	0x2500	0x04	TT	0
Start Delay	0x2100	0x0E	SD	100
Tare Time	0x2500	0x07	TI	0
Tare Window	0x2500	0x06	TW	0
Trigger	0x2005	0x03	TR	Write Only
Trigger Edge	0x2500	0x02	TE	0
Trigger Level	0x2500	0x01	TL	100

Int values as hex

A command parameter can be selected by highlighting it in the "Command Names" list view.

If a command parameter is writeable, the "Write" or "Write Value" button is enabled.

If a command parameter is a Boolean writeable but requires no value to be sent with the command parameter, only the "Write" button with no value field will be enabled.

Command Names

Command Name	Main Ind.	Sub Ind.	Command	Current Value
Delta Time	0x2500	0x0B	DT	50
Get Average	0x2900	0x06	GA	0.5339
Hold Time	0x2500	0x05	HT	0
Measure Time	0x2100	0x08	MT	100
ReTrig Stop	0x2500	0x08	TS	65535
ReTrig Window	0x2500	0x03	RW	65535
ReTrigger Time	0x2500	0x04	TT	0
Start Delay	0x2100	0x0E	SD	100
Tare Time	0x2500	0x07	TI	0
Tare Window	0x2500	0x06	TW	0
Trigger	0x2005	0x03	TR	Write Only
Trigger Edge	0x2500	0x02	TE	0
Trigger Level	0x2500	0x01	TL	100

Int values as hex

If a command parameter is writeable and requires a parameter value to be written together with the command, the "Value" text field is enabled and having the value of the current command parameter displayed. If the command parameter value in the "Value" text field is modified by the user, the "Write Value" and the "Save Value" buttons will be enabled. The modified value can now be written or saved to the module by selecting the "Write Value" or the "Save Value" button as explained below.

Command Names

Command Name	Main Ind.	Sub Ind.	Command	Current Value
Delta Time	0x2500	0x0B	DT	50
Get Average	0x2900	0x06	GA	0.5339
Hold Time	0x2500	0x05	HT	0
Measure Time	0x2100	0x08	MT	100
ReTrig Stop	0x2500	0x08	TS	65535
ReTrig Window	0x2500	0x03	RW	65535
ReTrigger Time	0x2500	0x04	TT	0
Start Delay	0x2100	0x0E	SD	100
Tare Time	0x2500	0x07	TI	0
Tare Window	0x2500	0x06	TW	0
Trigger	0x2005	0x03	TR	Write Only
Trigger Edge	0x2500	0x02	TE	0
Trigger Level	0x2500	0x01	TL	100

Value:

Int values as hex

If it's possible to save a command value to the EEPROM after it's written to the module, the "Save Value" button will be visible with the name of the save command by which the value will be saved to the EEPROM.

Not all command parameters can be saved to the EEPROM. In these cases, the "Save Value" button will not be visible.

By selecting the "Write Value" button, the modified command value, will be written to the current module.

A written value will not be saved to the EEPROM before the "Save Value" button is selected.

By selecting the "Save Value" button the written command will be stored in the EEPROM of the module.

All the values belonging to a specific save command will be stored to the EEPROM, when selecting the "Save Value" button.

If the values changed are not saved to the EEPROM of the current module, the original values stored in the EEPROM will be restored when the module is powered off/on. So, if the modified command parameter values are only written but not saved, the modified values are lost when power is removed from the module. This way it's possible to escape from a messy situation where the command parameters status of the module is unclear.

For the writeable command parameters in the calibration group, a “Calibrate Enable” command must be sent to the current module before the parameter value of a command can be changed.

By selecting the “Calibrate Enable” button, a calibrate enable command will be sent to the module.

Command Names

Command Name	Main Ind.	Sub Ind.	Command	Current Value
Absolute Gain	0x2300	0x01	AG	968
Absolute Zero	0x2300	0x02	AZ	438
Calibrate Enable	0x2300	0x03	CE	61
Calibrate Gain	0x2300	0x04	CG	10000
Calibrate Value	0x2300	0x18	CV	10000
Calibrate Zero	0x2300	0x0A	CZ	Write Only
Decimal Position	0x2300	0x0B	DP	4
Display Step	0x2300	0x0C	DS	1
Factory Default	0x2006	0x02	FD	Write Only
Firmware Type	0x2300	0x15	FT	0
Init Zero	0x2300	0x10	ZI	0
Multi Range	0x2300	0x0D	MR	0
Nonvolatile Zero	0x2300	0x14	ZN	0
Save Calibration	0x2004	0x02	CS	Write Only
Set Maximum1	0x2300	0x07	CM1	999999

Value:

Int values as hex

After the “Calibration Enable” command is sent, a given value of a writeable command in the calibration group can be changed and written to the module.

Command Names

Command Name	Main Ind.	Sub Ind.	Command	Current Value
Absolute Gain	0x2300	0x01	AG	968
Absolute Zero	0x2300	0x02	AZ	438
Calibrate Enable	0x2300	0x03	CE	61
Calibrate Gain	0x2300	0x04	CG	10000
Calibrate Value	0x2300	0x18	CV	10000
Calibrate Zero	0x2300	0x0A	CZ	Write Only
Decimal Position	0x2300	0x0B	DP	4
Display Step	0x2300	0x0C	DS	1
Factory Default	0x2006	0x02	FD	Write Only
Firmware Type	0x2300	0x15	FT	0
Init Zero	0x2300	0x10	ZI	0
Multi Range	0x2300	0x0D	MR	0
Nonvolatile Zero	0x2300	0x14	ZN	0
Save Calibration	0x2004	0x02	CS	Write Only
Set Maximum1	0x2300	0x07	CM1	999999

Value:

Int values as hex

After a command parameter value is written, the "Calibrate Enable" button becomes visible again and must be selected before another command parameter value can be modified.

The changed calibration values can be saved to the EEPROM of the current module by selecting the "Save Value (CS)" button. All the changed calibration values will be stored to the EEPROM of the module.

After a calibration value is saved by selecting the "Save Value (CS)" button, the "Calibrate Enable" TAC value is increased by +1.

Select the "Reload All" button to see the changed TAC value. The new TAC value is the value of the CE command.

If the changed calibration values are not saved to the EEPROM, the original values stored in the EEPROM will be restored when the module is powered off/on. So, if the calibration values are only written but not saved, the value of the command is lost when power is removed from the module. This way it's possible to escape from a messy situation where the command parameters status of the module is unclear.

Command Names

Command Name	Main Ind.	Sub Ind.	Command	Current Value
Absolute Gain	0x2300	0x01	AG	968
Absolute Zero	0x2300	0x02	AZ	438
Calibrate Enable	0x2300	0x03	CE	61
Calibrate Gain	0x2300	0x04	CG	10000
Calibrate Value	0x2300	0x18	CV	10000
Calibrate Zero	0x2300	0x0A	CZ	Write Only
Decimal Position	0x2300	0x0B	DP	3
Display Step	0x2300	0x0C	DS	1
Factory Default	0x2006	0x02	FD	Write Only
Firmware Type	0x2300	0x15	FT	0
Init Zero	0x2300	0x10	ZI	0
Multi Range	0x2300	0x0D	MR	0
Nonvolatile Zero	0x2300	0x14	ZN	0
Save Calibration	0x2004	0x02	CS	Write Only
Set Maximum1	0x2300	0x07	CM1	999999

Value:

Int values as hex

3.4 Dialogs

In the "Commands View" dialog there are several shortcut buttons by which other dialogs can be accessed.

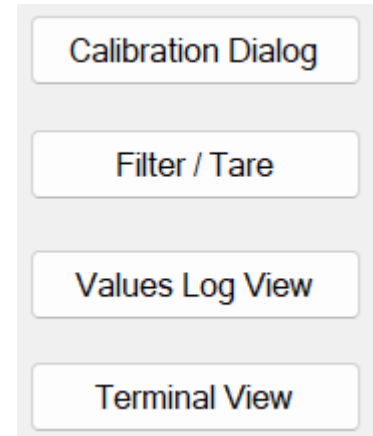
If zero and span calibration is to be performed, or the value of the "Decimal Position", is to be changed, it's recommended that the special dialog "Calibration Dialog" is used.

For changing filter command values, and setting tare, it's recommended that the special dialog "Filter / Tare" is used.

For viewing or saving all the command parameter values for the currently selected module, the "Values Log View" dialog can be used.

For reading and writing "raw" parameter values to and from a module, the "Terminal View" dialog can be used.

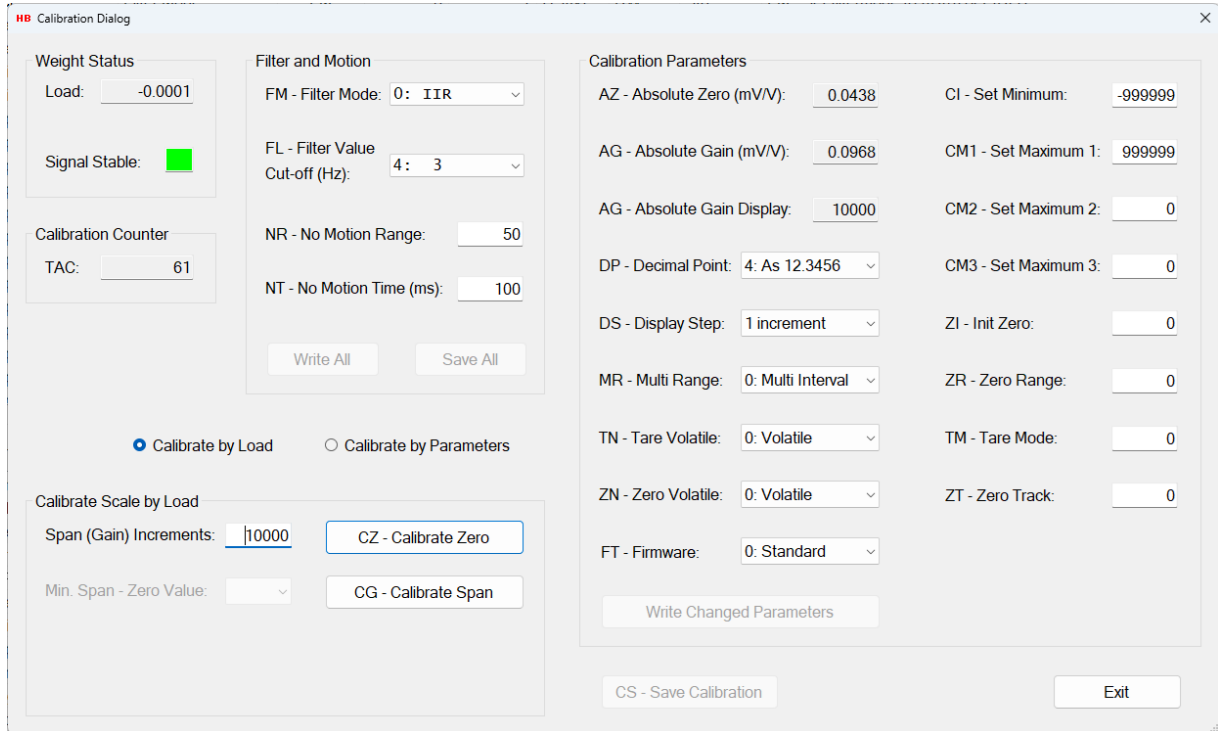
For detailed information on how to use the different dialogs, refer to the sections covering these items.



4 Calibration Dialog

The "Calibration Dialog" accessed from the "Commands View" dialog, is covering the most common calibration procedures.

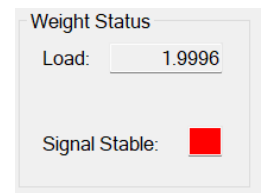
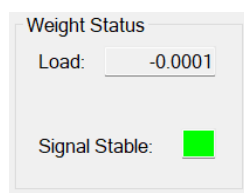
Besides the calibration description in this manual, the "DOP 4 Quick Start Manual" has a "Device Calibration Walkthrough" section which may also be useful.



The "Calibration Dialog" consists of several sections covering different aspects of zero / span calibration.

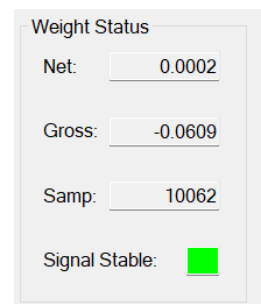
4.1 Weight Status

The "Weight Status" group box keeps an ongoing updated status of different weight command values from the "Weight" commands group, used for confirmation and weight status during the calibration procedure.



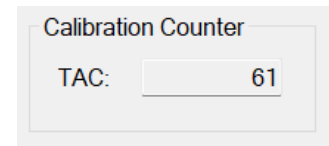
A stable signal from the load cell is indicated by a green square and an unstable signal is indicated by a red square. The sensitivity for having a stable signal can be adjusted by the "No Motion" command parameters and the Filter value.

The "Weight Status" group box When using the "Ethernet/IP" protocol the "Weight Status" group box is a bit more detailed.



4.2 Calibration Counter

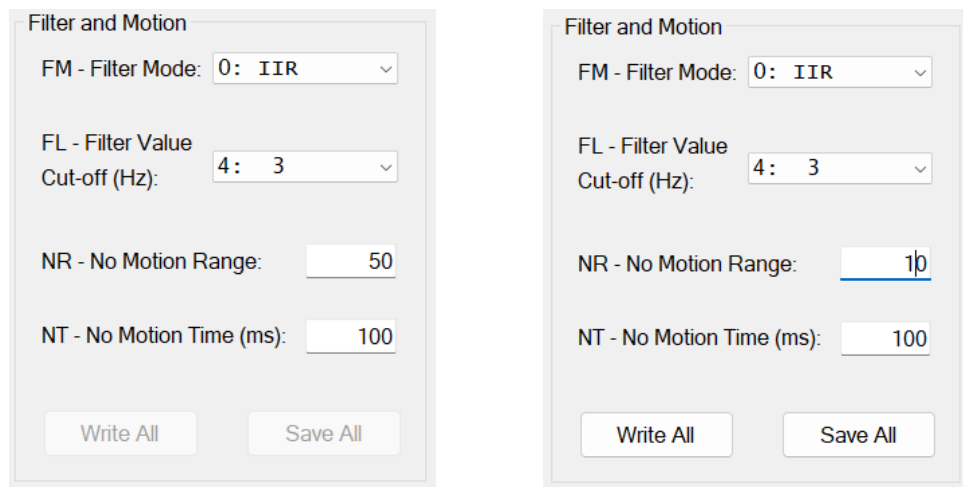
The "Calibration Counter" group box contains the current TAC value. The TAC value is increased by one when calibration command values are saved with the "Save Calibration" command.



Calibration Counter
TAC:

4.3 Filter and Motion

The "Filter and Motion" group box contains some of the command parameter values from the "Filter" commands group and the "Motion" commands group. The represented command parameters are to be used when adjustments to the values of these commands are needed due to calibration problems such as an unstable scale during calibration.



Filter and Motion

FM - Filter Mode: 0: IIR

FL - Filter Value
Cut-off (Hz): 4: 3

NR - No Motion Range: 50

NT - No Motion Time (ms): 100

Write All Save All

Filter and Motion

FM - Filter Mode: 0: IIR

FL - Filter Value
Cut-off (Hz): 4: 3

NR - No Motion Range: 10

NT - No Motion Time (ms): 100

Write All Save All

The value of the "No Motion Range" command can be increased to accept a wider range of scale instability (The range of accepted change of increments during the calibration measurement).

The value of the "No Motion Time" command can be decreased having a shorter balance period (The period in which the scale must be stable enough to fulfill the calibration).

The value of the filter level determines the 3 dB cut-off frequency and settling time. A high filter value (e.g., 8) results in a steadier scale weight value and a low one (e.g., 0) gives a more dynamic scale weight value, which can be more difficult to calibrate on.

4.3.1 Write Settings

To use the changed filter and motion settings for further calibration it's necessary to write the changed values. By selecting the "Write All" button, the changed filter and motion values are written for further use but not saved. If the values are only written, but not saved, the value of the settings is lost when power is removed from the module.

4.3.2 Save settings

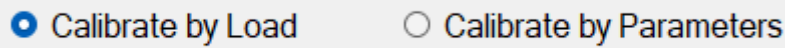
If the changed filter and motion settings are to be used after module power off/on, it's necessary to save the settings into the EEPROM of the module. By selecting the "Save All" button, the changed filter and motion values are saved into the EEPROM of the module.

4.4 Calibration methods

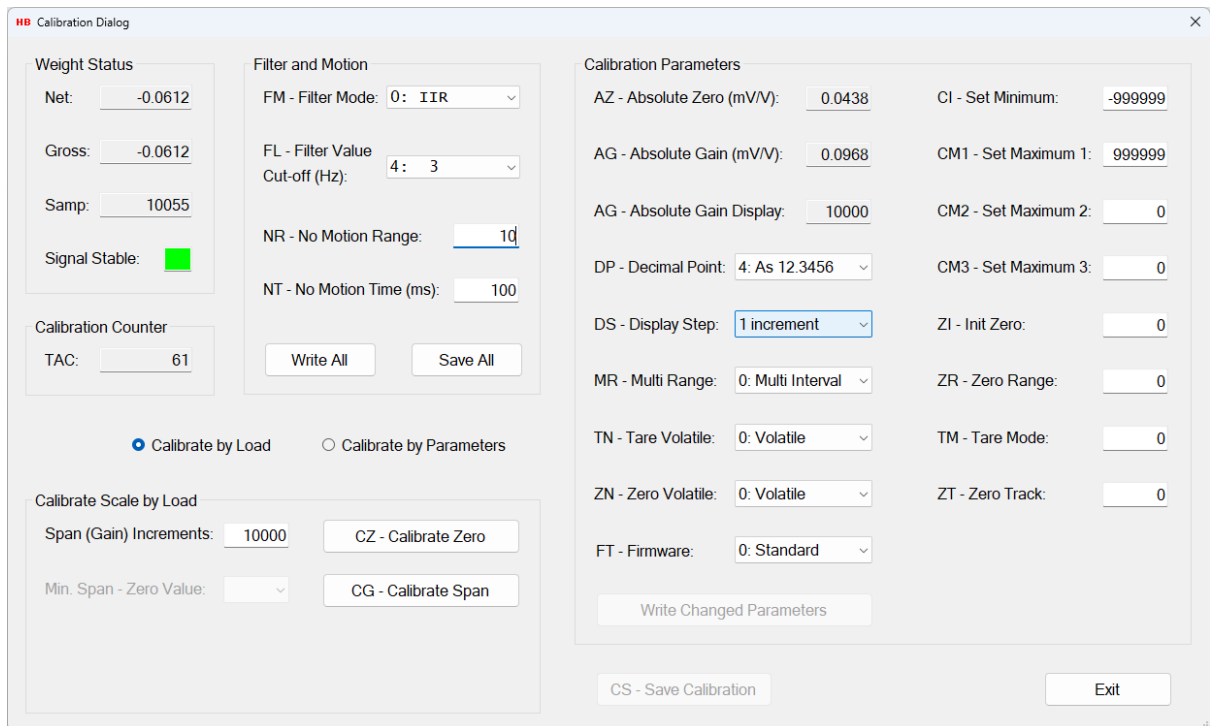
A calibration can be performed by a weight load on a scale or by entering calibration data manually.

4.4.1 Calibrate by Load method

By default, when entering the Calibration Dialog, the calibration method is set to "Calibrate by Load".



The "Calibrate Scale by Load" group box is enabled and the "AZ – Absolute Zero" and the "AG – Absolute Gain" fields are set to "Read Only" as shown in the figure below.



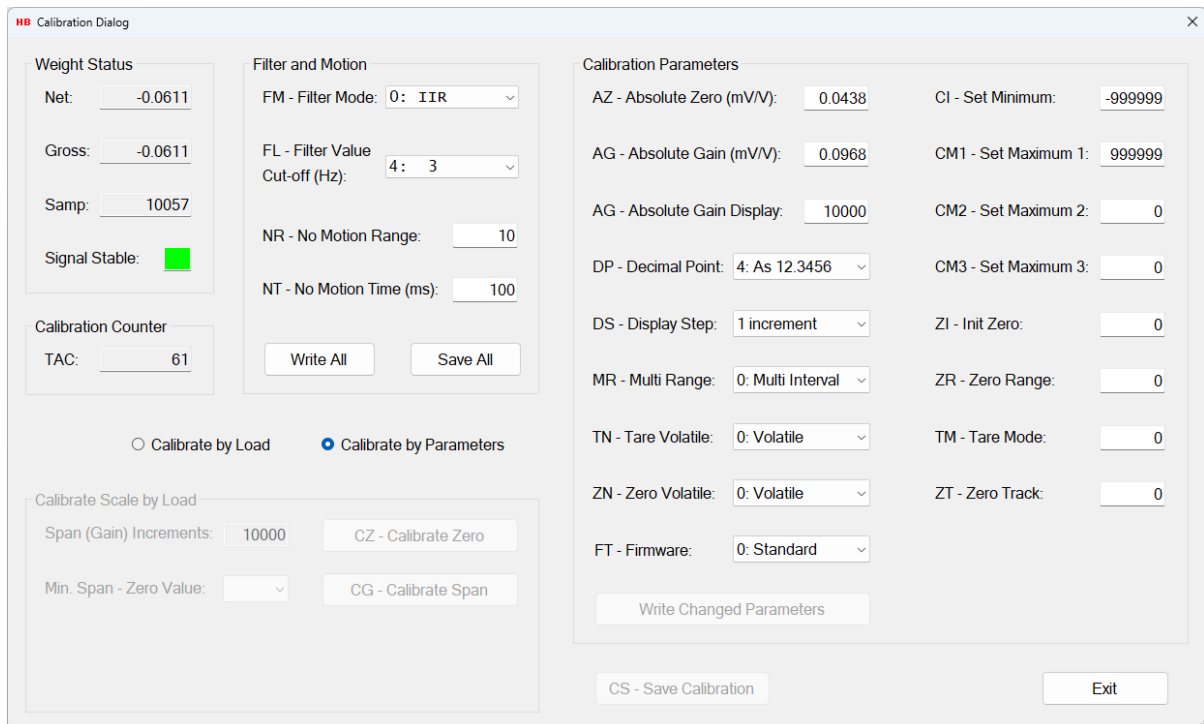
The calibration method "Calibrate by Load" is described in section covering the "Calibration by Weight Load".

4.4.2 Calibrate by Parameters method

When the “Calibrate by Parameters” radio button is selected, calibration values can be entered manually in the “Calibration Parameters” group box.



The “Calibrate Scale by Load” group box is disabled and the “AZ – Absolute Zero” and the “AG – Absolute Gain” fields are now enabled and set to read / Write mode, as shown in the figure below.



Setting the calibration parameters is described in the section covering the “Calibration Parameters”.

4.5 Calibration by Weight Load

The "Calibrate Scale by Load" group box consists of several buttons and command fields to be used during a zero / span calibration session.

IMPORTANT! When doing a calibration on modules having a "seal switch" such as the LDM64 module, remember to remove the seal switch if one is present.

4.5.1 Zero Calibration

A calibration session starts with a calibration of the zero-point.

Before calibrating the zero-point, be sure that the scale is unloaded.

When ready for zero calibration, select the "CZ - Calibrate Zero" button. A message reminder about unloading the scale will appear. Confirm the message and the zero-point calibration will start.

When the zero-point calibration is started, the ongoing calibration will be indicated by a yellow message box in the left bottom of the "Calibrate Scale by Load" group box.

If the zero-point calibration succeeded, the successful calibration will be indicated with a green message box in the left bottom of the "Calibrate Scale by Load" group box.

The screenshot shows the "Calibrate Scale by Load" interface. It includes a "Span (Gain) Increments" field set to 20000, a "Min. Span - Zero Value" dropdown set to 5%, and two buttons: "CZ - Calibrate Zero" and "CG - Calibrate Span". A yellow message box at the bottom left displays "CALIBRATING ZERO. WAIT!".

The screenshot shows the "Calibrate Scale by Load" interface after a successful calibration. The "Span (Gain) Increments" field is 20000, and the "Min. Span - Zero Value" dropdown is 5%. The "CZ - Calibrate Zero" button is highlighted with a blue border. A green message box at the bottom left displays "CALIBRATING ZERO DONE.".

By examine the "Weight Status" group box the zero-point weight values can be studied.

If the zero-point calibration fails, it will be indicated by a red message box in the left bottom of the "Calibrate Scale by Load" group box. A failing zero-point calibration can be caused by a too unstable scale. Try to adjust the parameters of the "Filter and Motion" group box as explained earlier in this section and retry.

The screenshot shows the "Calibrate Scale by Load" interface after a failed calibration. The "Span (Gain) Increments" field is 20000, and the "Min. Span - Zero Value" dropdown is 5%. The "CZ - Calibrate Zero" button is highlighted with a blue border. A red message box at the bottom left displays "CALIBRATING ZERO FAILED!".

4.5.2 Span Calibration

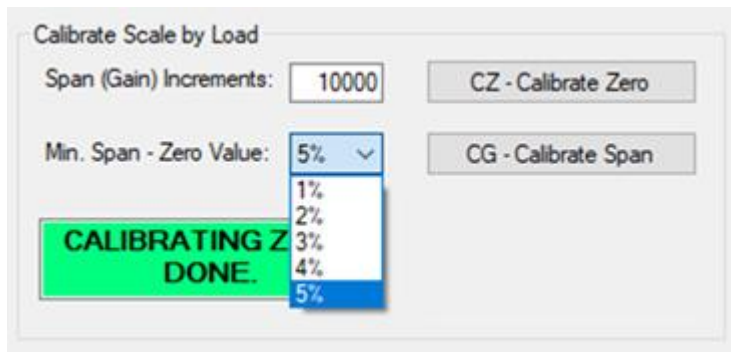
After the zero point has been calibrated successfully the span calibration procedure can be executed.

Before the span calibration is started, the span increments can be adjusted by changing the value of the "Span (Gain) Increments:" field, so the value matches the weight to be loaded when the span calibration is to be executed. Span increments are the weight value without the decimal point.

Also, the minimum percentage, by which the sample value must be increased when the scale is loaded with the span weight, can be adjusted by changing the value of the "Min. Span - Zero Value:" drop down box.

The minimum difference in the sample value between zero load and span load can be calculated by taking the maximum sample value for the module under calibration and calculate the percentage value indicated in the "Min. Span - Zero Value" drop box.

Using the LDM64 as an example, the maximum samples value is 262143. So, when using a 5% calculation, the minimum allowed difference between zero and span is 13103 samples and 5242 when the value is set to 2%

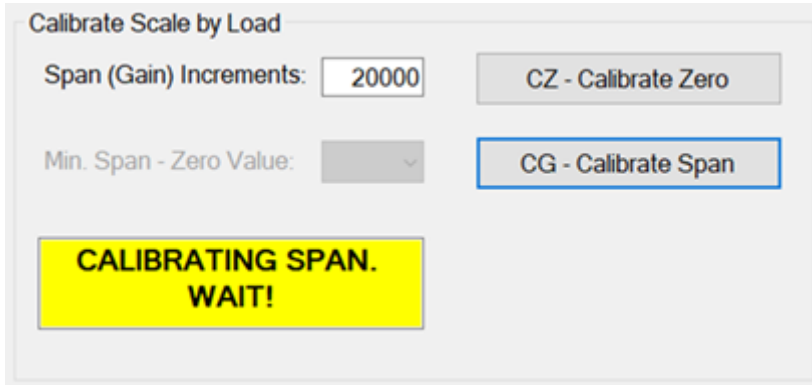


When the different values for the span calibration are set, the span calibration is ready to start.

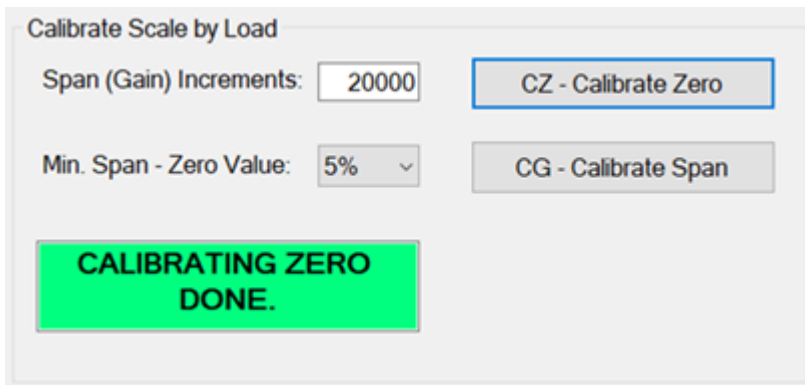
Be sure to load the scale with the correct weight load.

When ready for span calibration, select the "CG - Calibrate Span" button.

When the span calibration is started, the ongoing calibration will be indicated by a yellow message box in the left bottom of the "Calibrate Scale by Load" group box.



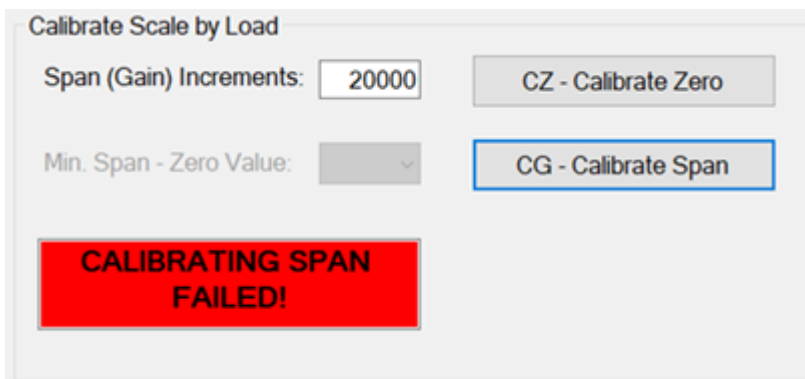
If the span calibration succeeded, the successful calibration will be indicated with a green message box in the left bottom of the "Calibrate Scale by Load" group box.



By examine the "Weight Status" group box the span weight values can be studied.

If the span calibration fails, it will be indicated by a red message box in the left bottom of the "Calibrate Scale by Load" group box.

A failing span calibration can be caused by a too unstable scale. Try to adjust the parameters of the "Filter and Motion" group box as explained earlier in this section and retry.



4.6 Calibration Parameters

From the “Calibration Parameters” group box, the values of various calibration command parameters can be examined and changed.

When changing one of the calibration parameters, the “Write Changed Parameters” button becomes enabled and by selecting the button the values of the changed parameters will be written to the module.

The values will not be saved to the EEPROM, so if the changed calibration parameters are to be used after module power off / on, it’s necessary to save the settings into the EEPROM of the module by selecting the “CS - Save Calibration” button.

Calibration Parameters

AZ - Absolute Zero (mV/V):	<input type="text" value="0.0438"/>	CI - Set Minimum:	<input type="text" value="-999999"/>
AG - Absolute Gain (mV/V):	<input type="text" value="0.0968"/>	CM1 - Set Maximum 1:	<input type="text" value="999999"/>
AG - Absolute Gain Display:	<input type="text" value="10000"/>	CM2 - Set Maximum 2:	<input type="text" value="0"/>
DP - Decimal Point:	<input type="text" value="4: As 12.3456"/>	CM3 - Set Maximum 3:	<input type="text" value="0"/>
DS - Display Step:	<input type="text" value="1 increment"/>	ZI - Init Zero:	<input type="text" value="0"/>
MR - Multi Range:	<input type="text" value="0: Multi Interval"/>	ZR - Zero Range:	<input type="text" value="0"/>
TN - Tare Volatile:	<input type="text" value="0: Volatile"/>	TM - Tare Mode:	<input type="text" value="0"/>
ZN - Zero Volatile:	<input type="text" value="0: Volatile"/>	ZT - Zero Track:	<input type="text" value="0"/>
FT - Firmware:	<input type="text" value="3: Drop Filling"/>		

4.6.1 Save Calibration

If the changed calibration parameters are to be used after module power off/on, it’s necessary to save the settings into the EEPROM of the module. By selecting the “CS - Save Calibration” button, the changed calibration parameters are saved into the EEPROM of the module.

The internal TAC value of the module will be increased by one.

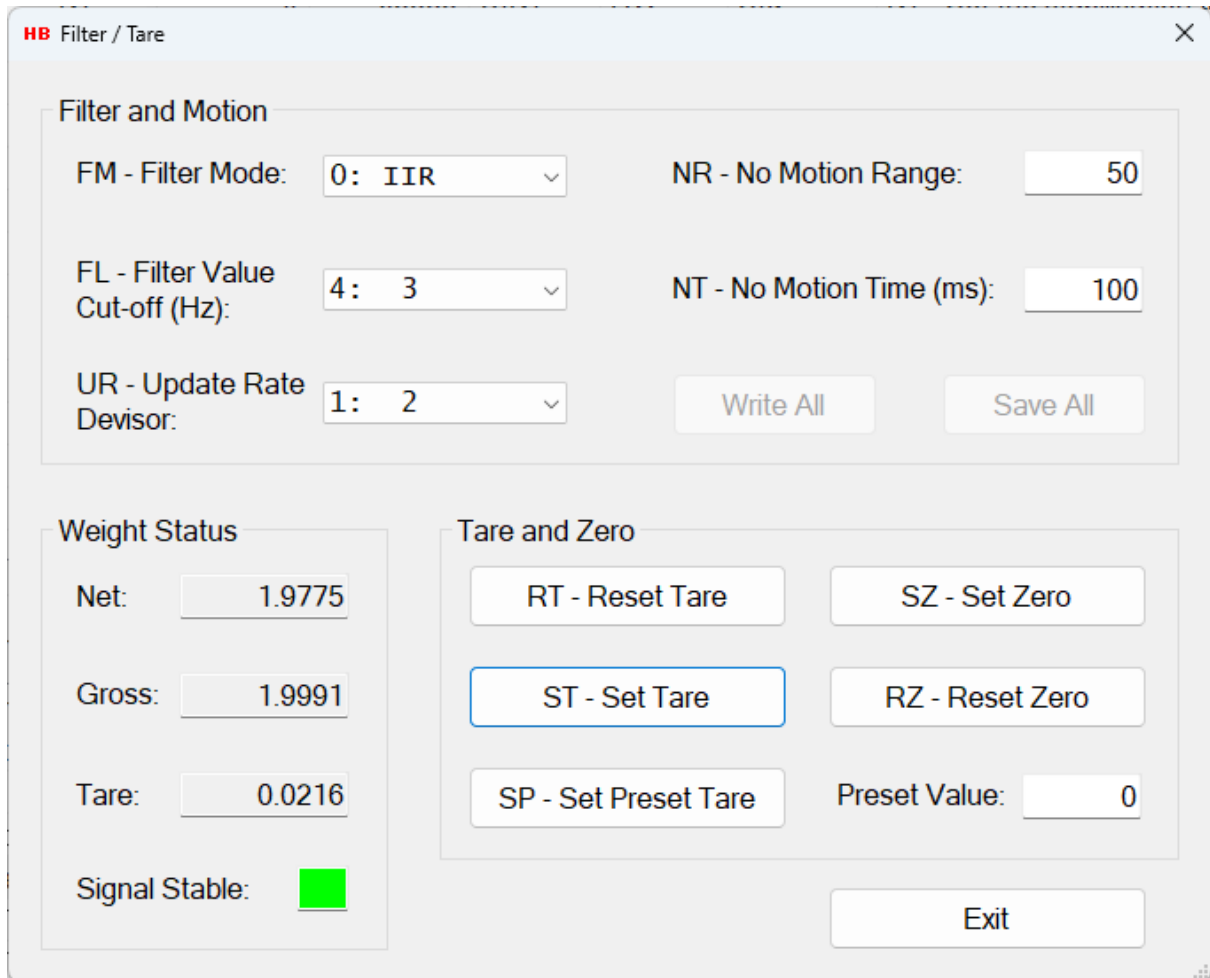
Calibration Counter

TAC:

5 Filter / Tare

The "Filter / Tare" dialog is a combined dialog for setting command parameter values belonging to the Filter and motion groups and to set and reset the current tare and zero values.

The "Filter / Tare" dialog can be accessed from the "Commands View" dialog.



By examine the "Weight Status" group box the changes in the net and gross weight values reflected by the changes of tare settings can be studied.

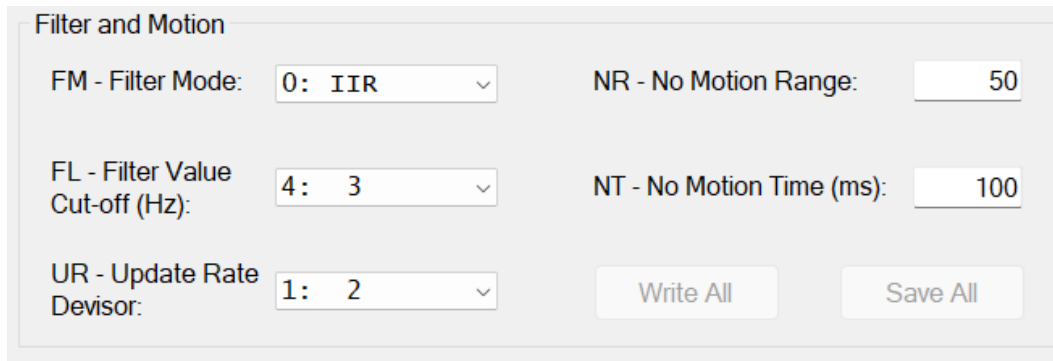
The Tare settings cannot be saved to the EEPROM. So, the tare settings will disappear after module power off/on.

The "Set Preset Tare" value will be stored directly to the EEPROM of the module.

5.1 Filter and Motion

The "Filter and Motion" group box contains the command values from the "Filter" commands group and the "Motion" commands group for easy setup of these parameters.

The "Filter and Motion" group box is also meant to be a help when setting tare in an unstable scale environment.



Filter and Motion

FM - Filter Mode: 0: IIR

NR - No Motion Range: 50

FL - Filter Value Cut-off (Hz): 4: 3

NT - No Motion Time (ms): 100

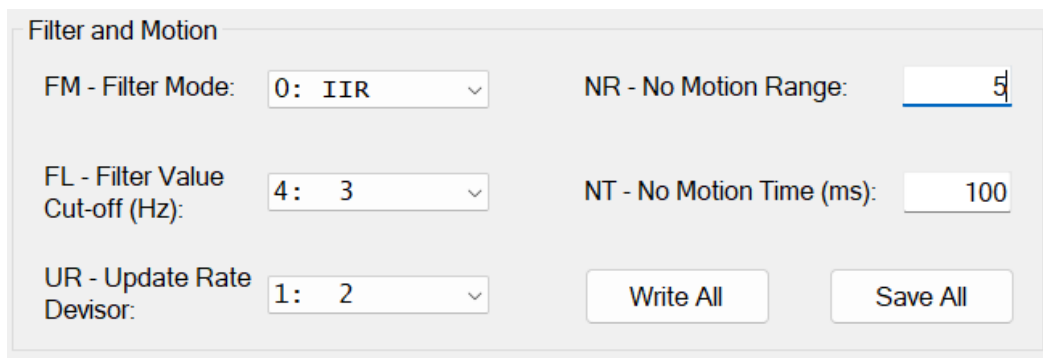
UR - Update Rate Devisor: 1: 2

Write All Save All

The value of the "No Motion Range" command can be increased to accept a wider range of motion increments when setting tare.

The value of the "No Motion Time" command can be decreased having a shorter balance period (The period in which the scale must be stable enough to fulfill the tarring scale max motion demands).

The value of the filter level determines the cut-off frequency and settling time. A high filter value (e.g., 8) results in a steadier scale weight value and a low one (e.g., 0) gives a more dynamic scale weight value, which can be more difficult to do tarring on.



Filter and Motion

FM - Filter Mode: 0: IIR

NR - No Motion Range: 5

FL - Filter Value Cut-off (Hz): 4: 3

NT - No Motion Time (ms): 100

UR - Update Rate Devisor: 1: 2

Write All Save All

5.1.1 Write Settings

By selecting the "Write All" button, the changed filter and motion values are written for further use but not saved. If the values are only written, but not saved, the value of the settings is lost when power is removed from the module.

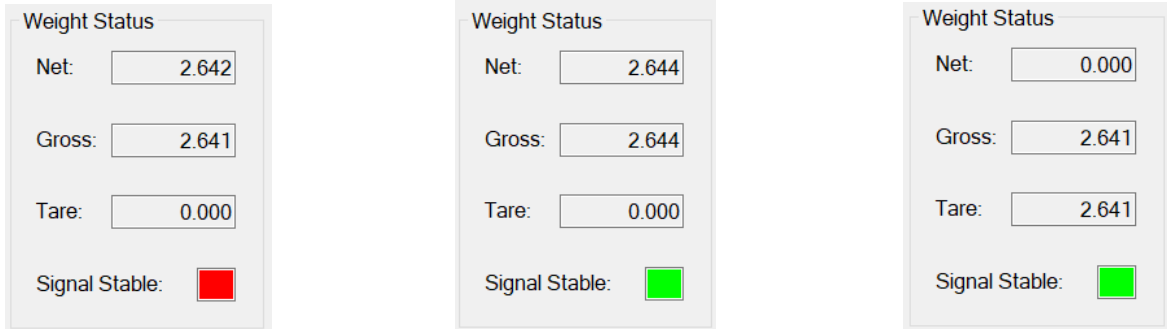
5.1.2 Save settings

If the changed filter and motion settings are to be used after module power off/on, it's necessary to save the settings into the EEPROM of the module. By selecting the "Save All" button, the changed filter and motion values are saved into the EEPROM of the module.

5.2 Weight Status

The "Weight Status" group box keeps an ongoing updated status of different weight command values from the "Weight" commands group, used for confirmation and weight status during the tarring procedure.

A stable signal from the load cell is indicated by a green square and an unstable signal is indicated by a red square. The sensitivity for having a stable signal can be adjusted by the "No Motion" parameters.



5.3 Tare Settings

By selecting the buttons "RT – Reset Tare" or "ST – Set Tare" the tare for the scale can be reset or set.

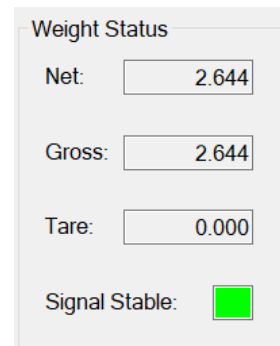


5.3.1 Reset Tare

When selecting the "RT- Reset Tare" button, the weighing signal returns to gross mode. So, after tare reset, both the net and gross weight will have the same values.

By examine the "Weight Status" group box the user will see that the net and gross values are equal, and the tare value is zero.

A stable signal from the load cell is indicated by a green square and an unstable signal is indicated by a red square. The sensitivity for having a stable signal can be adjusted by the "No Motion" parameters.

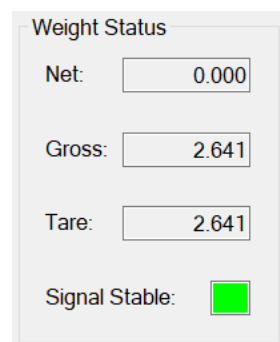


5.3.2 Set Tare

When ready for setting the tare, select the "ST - Set Tare" button.

If the tare setting succeeded, the tare setting will be reflected by the weight values in the "Weight Status" group box.

If the tare setting failed, a message box will appear saying that the tare setting went wrong. The unsuccessful setting can be caused by a too unstable scale. Try to adjust the parameters of the "Filter and Motion" group box as explained earlier in this section and retry.



5.4 Zero Settings

By selecting the buttons "RZ - Reset Zero" or "SZ - Set Zero" the zero-point for the scale can be reset or set.

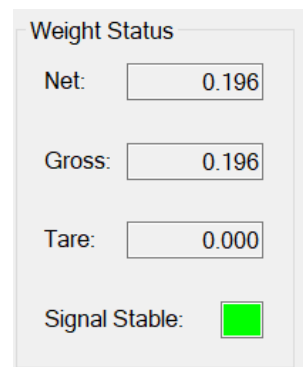


5.4.1 Reset Zero

When selecting the "RZ- Reset Zero" button, the weighing signal returns to gross mode. So, after zero reset, both the net and gross weight will have the same values.

By examine the "Weight Status" group box the user will see that the net and gross values are equal and the zero value is zero.

A stable signal from the load cell is indicated by a green square and an unstable signal is indicated by a red square. The sensitivity for having a stable signal can be adjusted by the "No Motion" parameters.

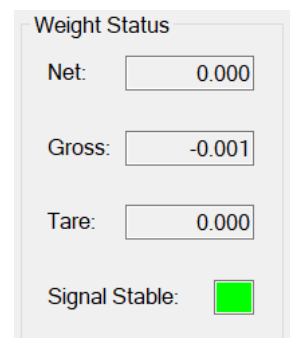


5.4.2 Set Zero

When ready for setting the zero-point, select the "SZ - Set Zero" button.

If the zero-point setting succeeded, the zero-point setting will be reflected by the weight values in the "Weight Status" group box.

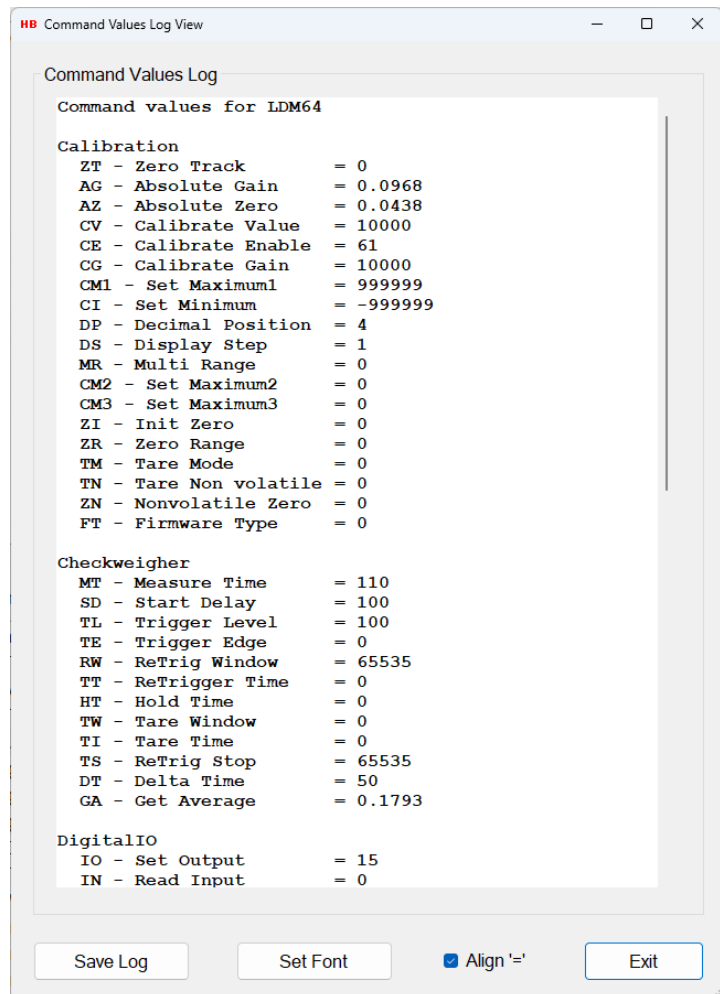
If the zero-point setting failed, a message box will appear saying that the zero-point setting went wrong. The unsuccessful setting can be caused by a too unstable scale. Try to adjust the parameters of the "Filter and Motion" group box as explained earlier in this section and retry.



6 Values Log View

The "Values Log View" dialog is a tool for viewing the values of all the valid command parameters for the currently selected module.

The "Values Log View" dialog can be accessed from the "Commands View" dialog.



6.1.1 Save Log

By selecting the "Save Log" button, the content of the "Command Values Log" text field can be saved to a disk file either as a plain text file or as a formatted RTF text file to be viewed as a Word document.

6.1.2 Set Font

Selecting the "Set Font" button, the font and the size of the "Command Values Log" text field content can be adjusted.

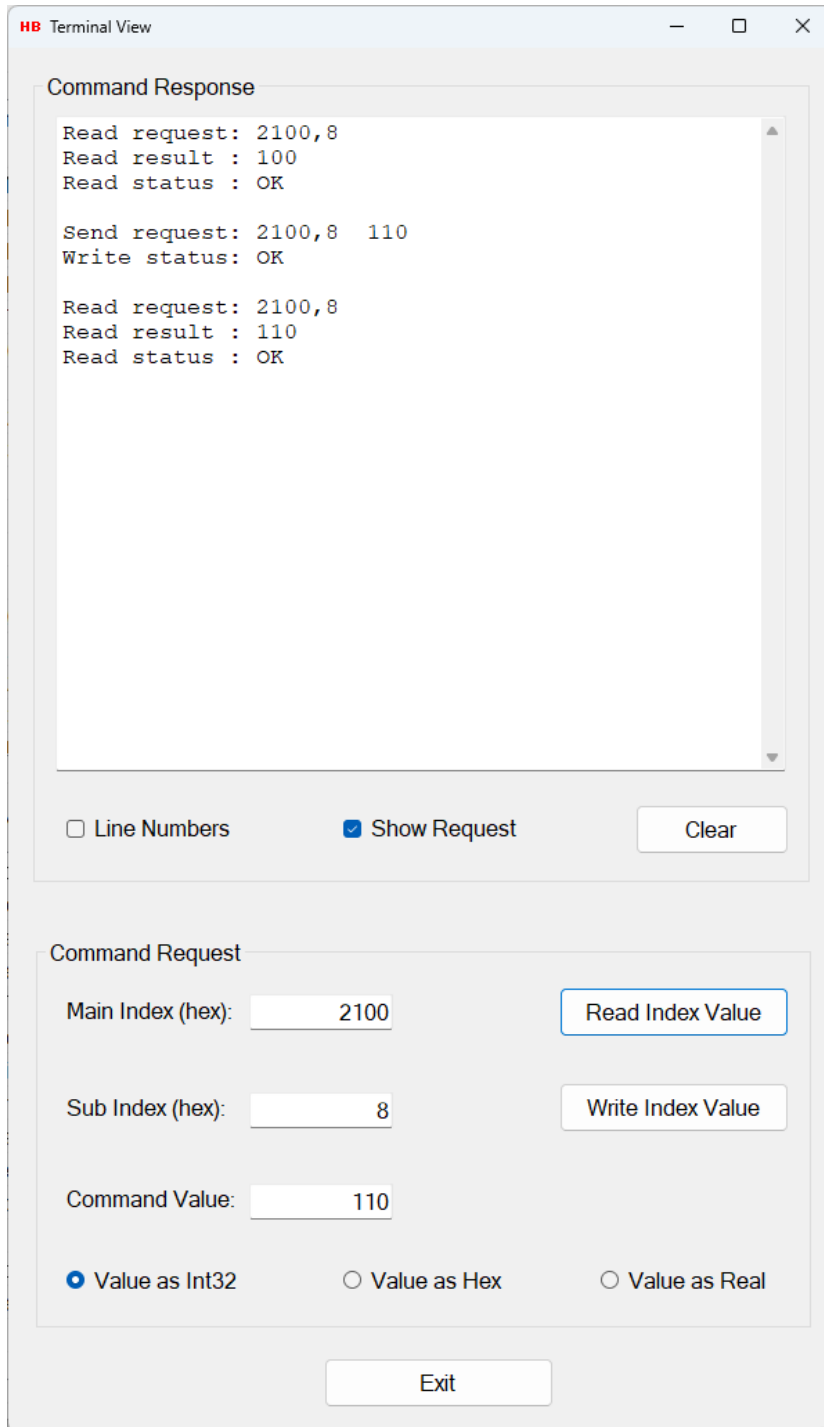
6.1.3 Align '='

By checking the "Align '='" field the content of the "Command Values Log" text field can be adjusted so all the '=' signs are aligned together.

7 The Terminal View

The "Terminal View" dialog is a dialog tool for sending raw parameter commands to the current module and to examine the received command responses.

The "Terminal View" dialog consists of a "Command Request" group box containing the tools for sending and receiving command parameter requests, and a "Command Response" group box containing the tools for displaying the command responses.



The "Terminal View" dialog can be accessed from the "Commands View" dialog.

The "Terminal View" dialog can also be opened from the "Selected Channels" group box by highlighting one of the selected channels in the list view and then select the "Terminal View" button.

Selected Channels

Channel	Module	Device Name	Device Id
02	01	LDM64	6410
03	04	LDM64	6410

Remove Channel

Commands View

Terminal View

7.1.1 Command request

A main and sub index for a given command parameter can be entered in the corresponding fields and by selecting the "Read Index Value" button, the value of the defined index will be read and placed in the "Command Value" Field and in the "Command Response" text box.

If a valid integer value is entered in the "Command Value" text field, and the "Write Index Value" button is selected, the value will, if possible, be written to the module as a parameter with the CANopen command index selected by the "Main Index" and "Sub Index" fields. The response if any will be displayed in the "Command Response" text box.

The different parameter values will by default be displayed as integer values.

By checking the "All Values as Hex" check box, the different parameter values will be displayed as hex values.

By checking the "All Values as Real" check box, the different parameter values will be displayed as Real values. If weight values are to be displayed, Real values should be selected.

Command Request

Main Index (hex):

Sub Index (hex):

Command Value:

Read Index Value

Write Index Value

Value as Int32
 Value as Hex
 Value as Real

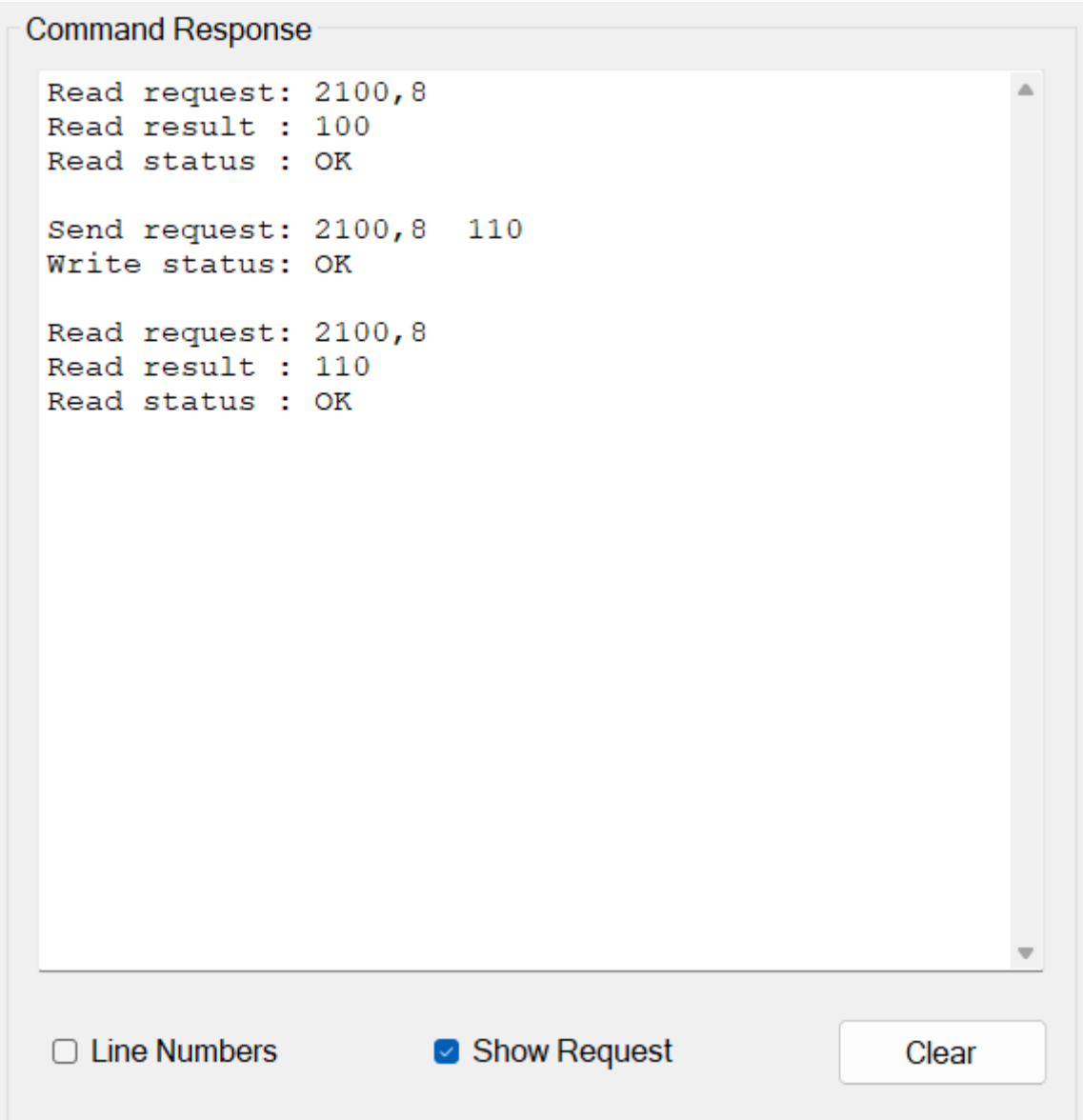
7.1.2 Command response

In the "Command Response" text box, all the input and output parameter values for a given command defined by a main index and sub index value received from the current module will be displayed as received or sent.

If the "Line Numbers" check box is checked, line numbers will be added in front of the displayed text strings.

If the "Show Request" check box is checked, the read or send request for the value of a specific main and sub index is displayed in the "Command Response" text box.

Selecting the "Clear" button will clear the "Command Response" text box.



The screenshot shows a window titled "Command Response" with a text area containing the following text:

```
Read request: 2100,8  
Read result : 100  
Read status : OK  
  
Send request: 2100,8 110  
Write status: OK  
  
Read request: 2100,8  
Read result : 110  
Read status : OK
```

At the bottom of the window, there are three controls:

- Line Numbers
- Show Request
- Clear