



# **DOP 4**

## **USERS MANUAL**

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# **1 Introduction**

## **1.1 Purpose**

The purpose of this document is to describe how to use the "Device Operating Program" DOP 4 application as a tool for calibrating the H&B load cell digital amplifier devices and making detailed recordings of load cell data streamed from these H&B devices.

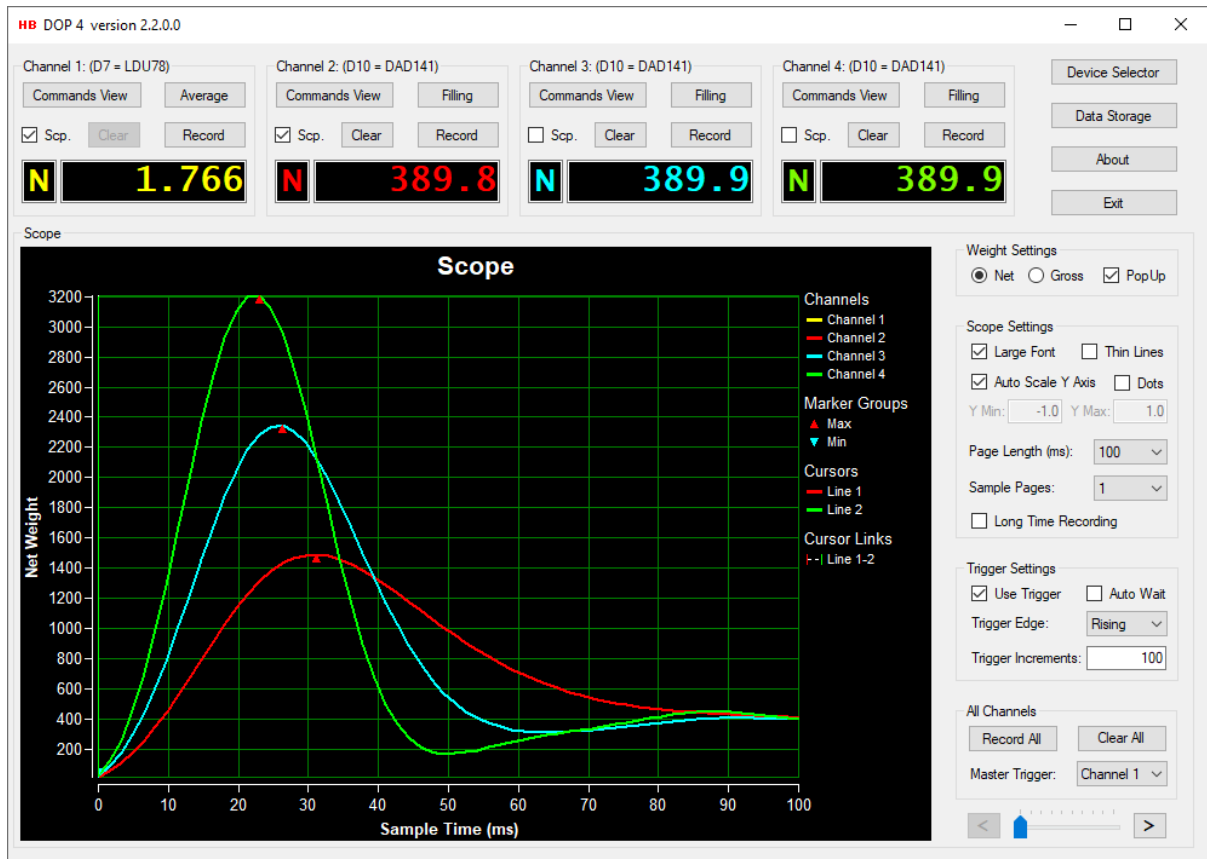
The "Device Operating Program" DOP 4 application will hereafter be referred to as the DOP 4 application.

The detailed functionality of the different device command parameters used in the DOP 4 application will not be explained in this document. The commands are described in detail in other documents covering the functionalities of the different H&B devices.

By having an active internet connection to the PC running the DOP 4 application, it is possible to access the web pages describing the functionality of different command parameters in details. In different areas of the DOP 4 application, help buttons are placed to gain easy access to the command documentation web pages.

## 1.2 Overview

The DOP 4 application is a tool for calibrating, analyzing and fine-tuning measurement parameters for several of the Hauch & Bach digital amplifier devices for weighing and force measurements, such as the DAS 72.1, DAD 141.1, LDM64.1, LDM 88.1 and the LDU series LDU 68.x, LDU 69.1, LDU 78.1 and LDU179.1. All new devices will also be supported by the DOP 4 application as they are released.



The main page consists of four channel groups from which recording, measurement and H&B device calibration can be controlled after the devices under test are assigned to the channels from the "Device Selector" dialog.

Special dialogs are available for detailed average measurements.

Analyzing recordings can be done by examination of the scope object containing the graphical representation of the data recorded.

Recorded load cell data can be stored in separate files from the "Data Storage" dialog. The stored data can later be reloaded into the scope display.

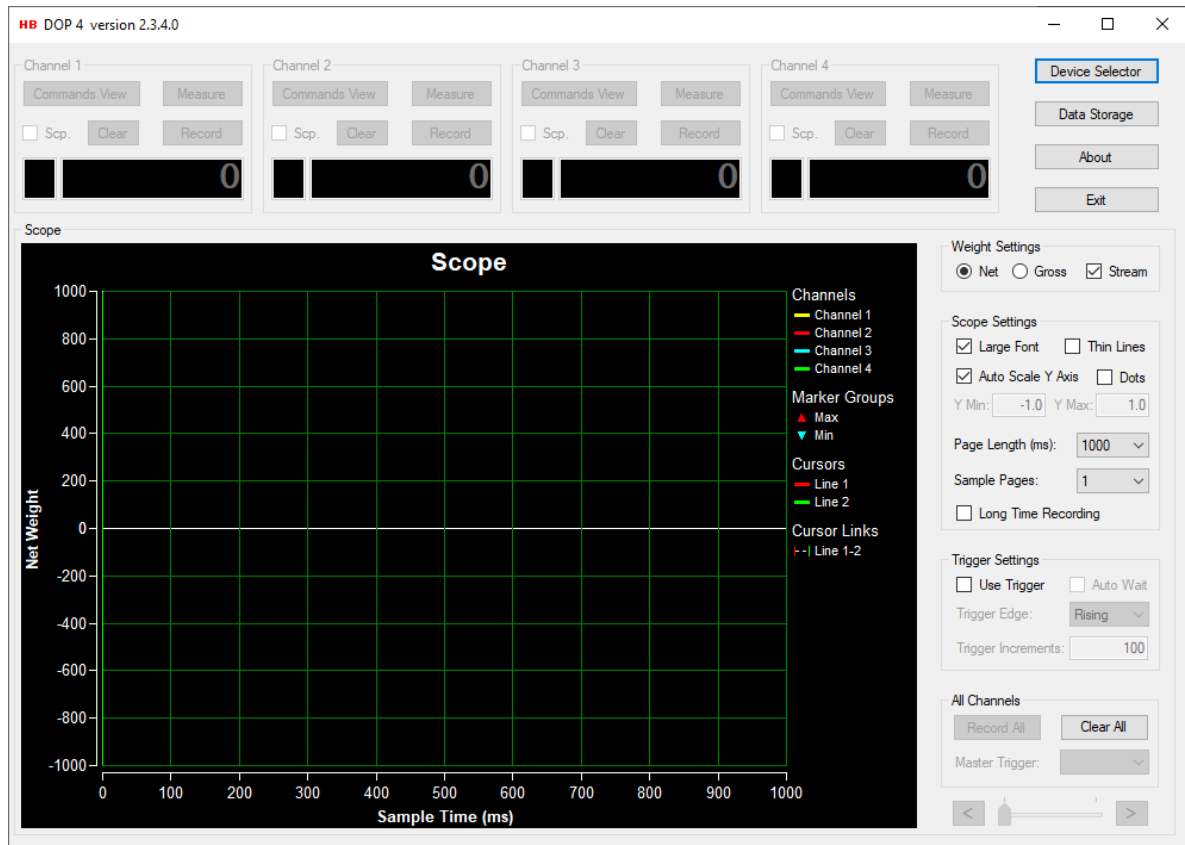
Calibration and tarring of H&B devices can be done from special "Calibration" and "Filter / Tare" dialogs.

For detailed information on recording, measuring, calibration and filtering, refer to the specific sections covering these issues.

## 2 Application Startup

The first window which appears after DOP 4 application startup, is the main window.

The main window is quite empty until some H&B devices are assigned to one or more of the four channel groups. So, before calibration and measuring can start, the first thing to do after DOP 4 startup is to assign one or more H&B devices to one or more of the H&B device channels.



After the main window is opened, the "Device Selector" dialog opens automatically for easy access to the selection of H&B devices for test and configuration.

From the "Device Selector" menu, the user selects the H&B devices to be used in a DOP 4 session.

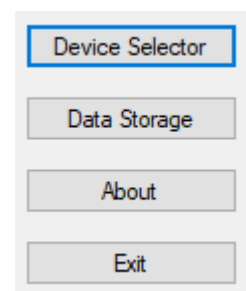
The details around the "Device Selector" dialog are explained in the section covering the "Device Selector" dialog.

Recorded scope display data can be saved and reloaded from the "Data Storage" dialog. Stored scope data files can be loaded without any assignment of H&B devices.

The details around the "Data Storage" dialog are explained elsewhere in this document.

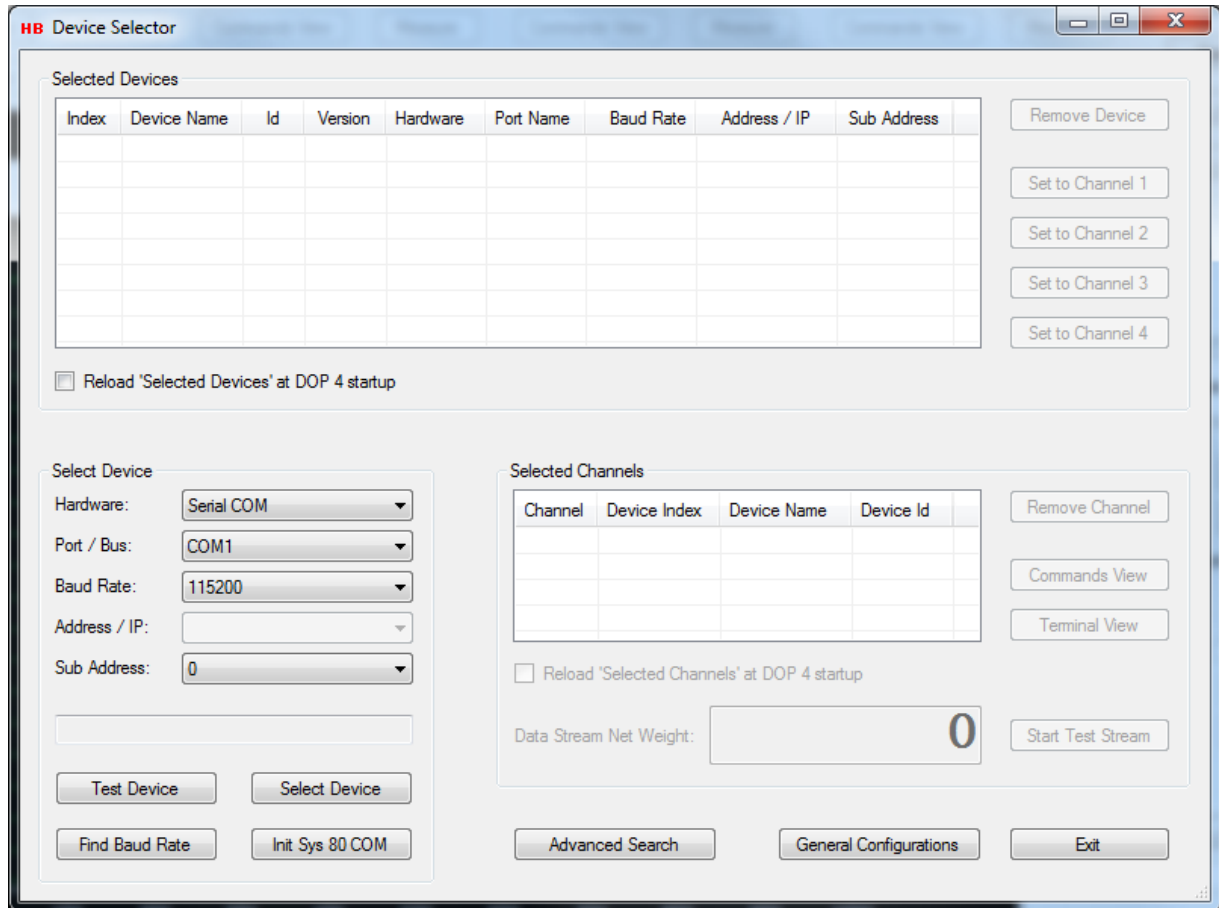
By selecting the "About" button, the user can get information about the current version of the DOP 4 application.

By selecting the "Exit" button, the DOP 4 application will be terminated.



### 3 Device Selector

The “Device Selector” dialog is the dialog where H&B devices are selected for use in a DOP 4 session.



Select one or more H&B devices and assign them to one or more device channels to be used in the main window, calibration, and measurement dialogs.

One H&B device can be assigned to one or more available device channel.

Up to 4 device channels are available for assignment from up to four different H&B devices.

### 3.1 Select Device

From the "Select Device" group box, the different H&B devices to be used for communication are selected.

The current version of the DOP 4 application supports serial COM ports, Serial LAN, CANopen, Modbus TCP, Modbus RTU and Profibus communication.

Select the hardware type, the communication port, the baud rate and the addresses matching the H&B device to be selected. Select the "Select Device" button to select the device or select the "Test Device" button to test for device connection.

#### 3.1.1 Select device interface

##### Serial COM:

To select an H&B device using a serial COM port as interface, select the Hardware type: "Serial COM".

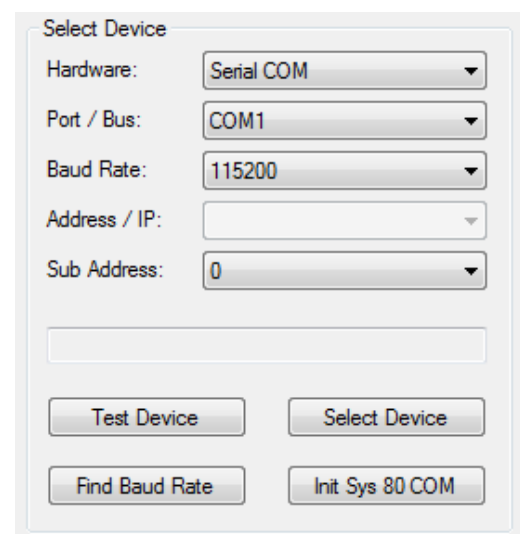
Select the COM port to which the device is connected.

Select the correct baud rate for the device.

If more than one H&B device is connected to the same COM port, a specific device can be selected by selecting the correct "Sub Address", belonging to that device.

By selecting the "Find Baud Rate" button, the device will be searched for several valid baud rates in increasing order.

If a baud rate matching the baud rate for the device is found, that baud rate will be selected and the name of the found device will be displayed in the status field.



The screenshot shows the 'Select Device' dialog box with the following settings:

- Hardware: Serial COM
- Port / Bus: COM1
- Baud Rate: 115200
- Address / IP: (empty)
- Sub Address: 0

Buttons at the bottom: Test Device, Select Device, Find Baud Rate, Init Sys 80 COM.

##### Serial LAN:

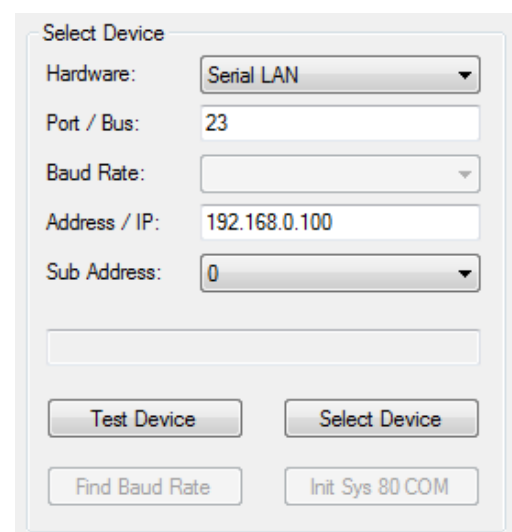
To select an H&B device using Serial LAN as interface, select the Hardware type: "Serial LAN".

Select the LAN socket port to which the device is to be accessed.

Select the LAN IP address to which the device is to be accessed.

If more than one H&B device is connected to the same IP address / port, a specific device can be selected by selecting the correct "Sub Address", belonging to that device.

The Serial LAN interface can be used with H&B devices supporting a RS 232 / 422 / 485 interface to which a LAN interface adaptor is connected.



The screenshot shows the 'Select Device' dialog box with the following settings:

- Hardware: Serial LAN
- Port / Bus: 23
- Baud Rate: (empty)
- Address / IP: 192.168.0.100
- Sub Address: 0

Buttons at the bottom: Test Device, Select Device, Find Baud Rate, Init Sys 80 COM.

### CANopen:

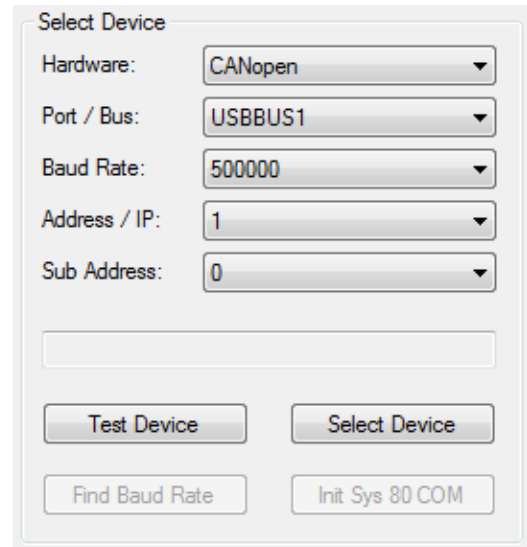
To select an H&B device using CANopen as interface, select the Hardware type: "CANopen".

Select the hardware bus, normally an USB bus, to which the device is connected.

Select the correct baud rate for the connection.

If more than one main device is connected to the same bus interface, a specific main device can be selected by selecting the correct "Address", belonging to that main device.

If more than one sub device is connected to the same bus interface, a specific sub device can be selected by selecting the correct "Sub Address", belonging to that sub device.



The 'Select Device' dialog box for CANopen configuration contains the following fields and buttons:

- Hardware:** Dropdown menu set to 'CANopen'.
- Port / Bus:** Dropdown menu set to 'USBUS1'.
- Baud Rate:** Dropdown menu set to '500000'.
- Address / IP:** Dropdown menu set to '1'.
- Sub Address:** Dropdown menu set to '0'.
- Buttons:** 'Test Device', 'Select Device', 'Find Baud Rate', and 'Init Sys 80 COM'.

### Modbus TCP:

To select an H&B device using Modbus TCP port as interface, select the Hardware type: "Modbus TCP".

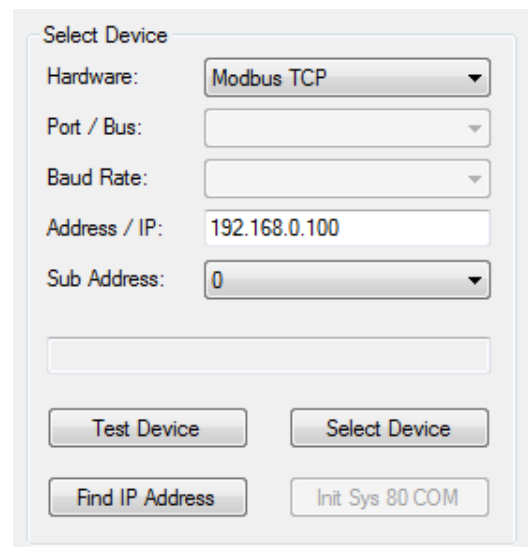
Select the IP address to which the device is to be accessed.

If more than one device is connected to the same Modbus TCP address, a specific device can be selected by selecting the correct "Sub Address", belonging to that device.

By selecting the "Find IP Address" button, the Modbus TCP port 502 will be searched for IP addresses.

The found addresses will be presented in a drop-down box if more than one address is found.

If just one address is found, the IP address will be displayed in the "Address / IP" field.



The 'Select Device' dialog box for Modbus TCP configuration contains the following fields and buttons:

- Hardware:** Dropdown menu set to 'Modbus TCP'.
- Port / Bus:** Empty dropdown menu.
- Baud Rate:** Empty dropdown menu.
- Address / IP:** Text field containing '192.168.0.100'.
- Sub Address:** Dropdown menu set to '0'.
- Buttons:** 'Test Device', 'Select Device', 'Find IP Address', and 'Init Sys 80 COM'.

**Warning!** LDM88.1 devices will be reset at this procedure.

Other H&B devices supporting Modbus TCP will not be affected by the search procedure.

### Modbus RTU:

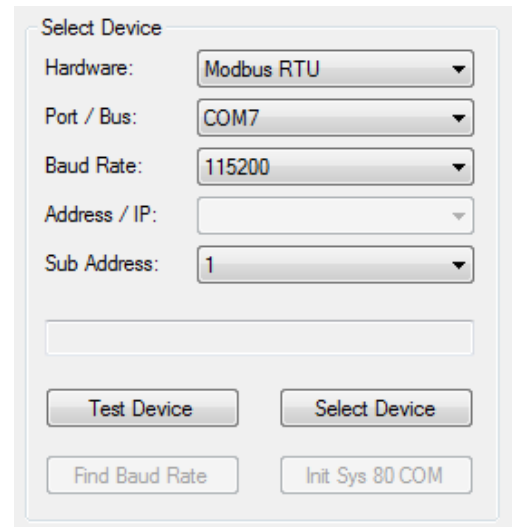
To select an H&B device using a Modbus RTU port as interface, select the Hardware type: "Modbus RTU".

Select the COM port to which the device is connected.

Select the correct baud rate for the device.

If more than one H&B device is connected to the same COM port, a specific device can be selected by selecting the correct "Sub Address", belonging to that device.

For the DAD141 some settings are best done from the front panel of the device. Set communication to "RTU". (8.8). Set the correct parity (8.7) and the device address (8.3) which must be at least 1 for the DAD141 when using Modbus RTU mode.



Select Device

Hardware: Modbus RTU

Port / Bus: COM7

Baud Rate: 115200

Address / IP:

Sub Address: 1

Test Device

Select Device

Find Baud Rate

Init Sys 80 COM

### Profibus:

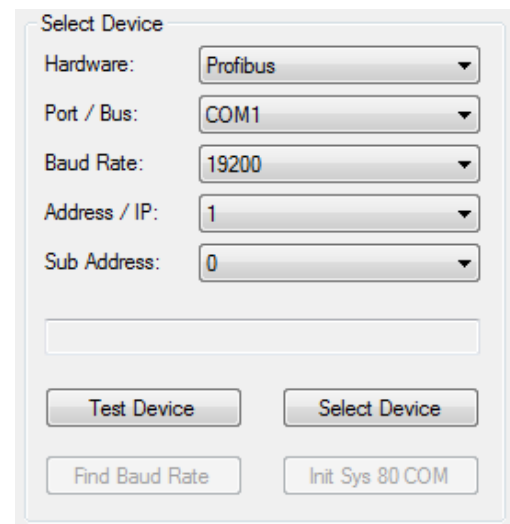
To select an H&B device using Profibus as interface, select the Hardware type: "Profibus".

Select the COM port to which the device is connected.

Select the correct baud rate for the device.

If more than one main device is connected to the same bus interface, a specific main device can be selected by selecting the correct "Address", belonging to that main device.

If more than one sub device is connected to the same bus interface, a specific sub device can be selected by selecting the correct "Sub Address", belonging to that sub device.



Select Device

Hardware: Profibus

Port / Bus: COM1

Baud Rate: 19200

Address / IP: 1

Sub Address: 0

Test Device

Select Device

Find Baud Rate

Init Sys 80 COM

### 3.1.2 System 80 / MCS-64 on serial COM

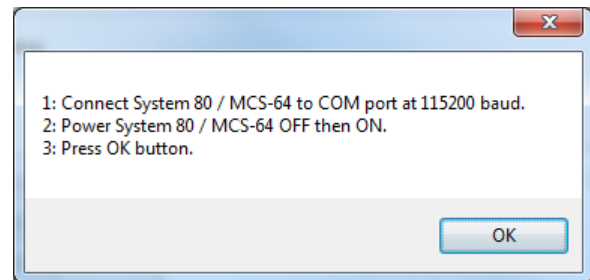
Having a System 80 / MCS-64 system, it's possible to establish a connection through the service port (COM port at 115200 baud), by selecting the "Init Sys 80 COM" button. By selecting the "Init Sys 80 COM" button the message showed on the right will appear.

Follow the instruction in the message box. If a LDM 88.1 with the defined sub address is found, the name and version of the LDM 88.1 will be displayed in the status field.

Before the "Init Sys 80 COM" button is selected, the correct COM port, baud rate and sub address must be selected in the "Select Device" group box.

**Remark:**

While using the service port, no bus communication (Profibus, CANopen or Ethernet) with the LDM 88.1 is possible!



Select Device

Hardware: Serial COM

Port / Bus: COM2

Baud Rate: 115200

Address / IP:

Sub Address: 0

Device: LDM88 with Id: 8813 found.

Test Device Select Device

Find Baud Rate Init Sys 80 COM

### 3.1.3 Test device / Select device

By selecting the "Test Device" button, it can be tested if a valid H&B device is attached to the specified communication port.

If the H&B device name is displayed in the status field, the device is found and accepted as a valid H&B device.

By selecting the "Select Device" button, the device information for the selected H&B device will be added to the "Selected Devices" list view, ready for channel selection.

Several H&B devices can be selected. All the selected devices will appear in the "Selected Devices" list view.

Select Device

Hardware: Serial COM

Port / Bus: COM7

Baud Rate: 115200

Address / IP:

Sub Address: 0

Device: DAS72 with Id: 7210 found.

Test Device Select Device

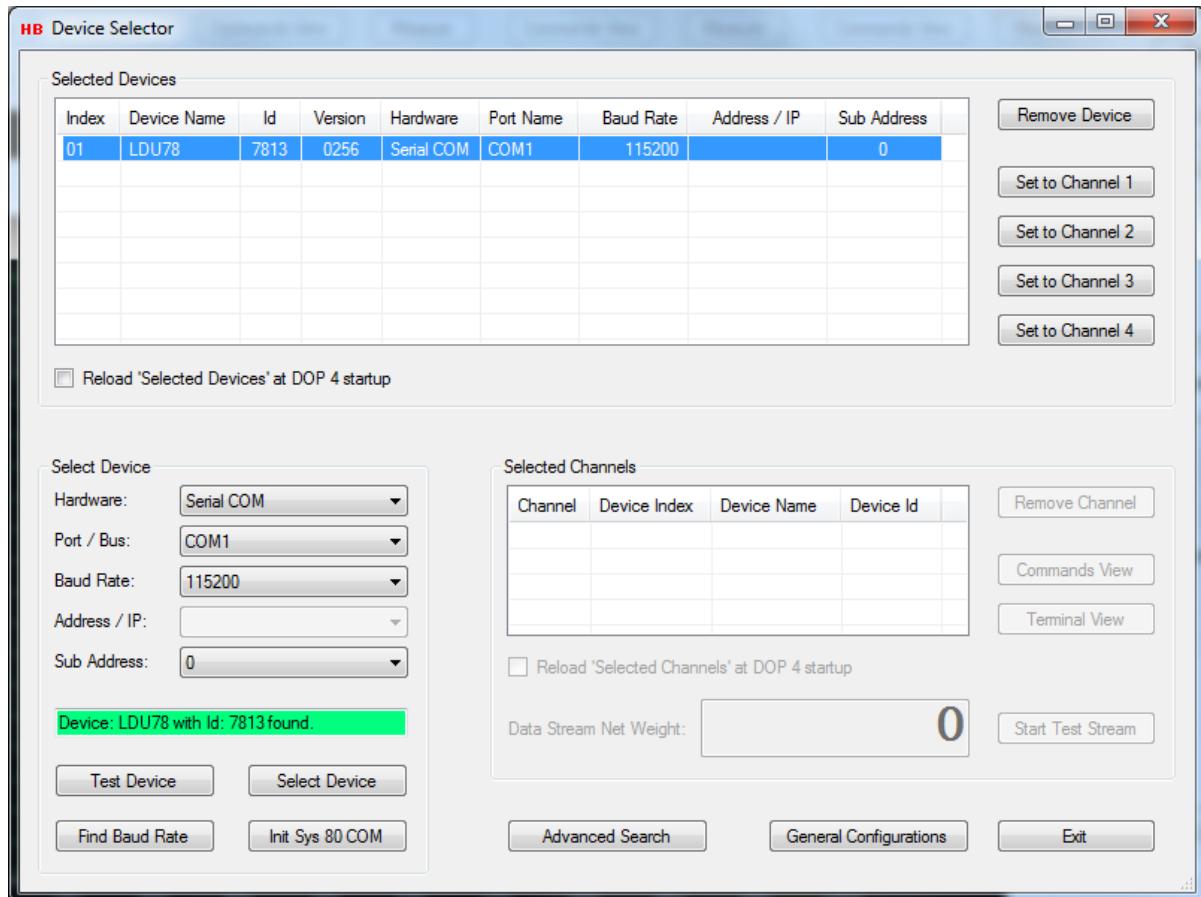
Find Baud Rate Init Sys 80 COM

If no H&B devices was found after selecting the "Test Device" or "Select Device" buttons, the message "No Device!" will be showed in the status field.

If a selected H&B device already exists in the "Selected Devices" list view, the message "Device already selected!" will be displayed in the status field after selecting the "Select Device" button.

## 3.2 Selected Devices

An H&B device in the "Selected Devices" list view can be highlighted by clicking on the device description.



Index	Device Name	Id	Version	Hardware	Port Name	Baud Rate	Address / IP	Sub Address
01	LDU78	7813	0256	Serial COM	COM1	115200		0

☐ Reload 'Selected Devices' at DOP 4 startup

Select Device

Hardware: Serial COM

Port / Bus: COM1

Baud Rate: 115200

Address / IP:

Sub Address: 0

Device: LDU78 with Id: 7813 found.

Test Device Select Device

Find Baud Rate Init Sys 80 COM

Selected Channels

Channel	Device Index	Device Name	Device Id
---------	--------------	-------------	-----------

☐ Reload 'Selected Channels' at DOP 4 startup

Data Stream Net Weight: 0

Advanced Search General Configurations Exit

Remove Device

Set to Channel 1

Set to Channel 2

Set to Channel 3

Set to Channel 4

Remove Channel

Commands View

Terminal View

Start Test Stream

Selecting the "Remove Device" button, will remove the highlighted H&B device from the "Selected Devices" list view. The device can only be removed from the list view if it's not assigned to a device channel. So selected devices assigned to one or more channels must be removed from the "Selected Channels" list view, before they can be removed from the "Selected Devices" list view.

### 3.2.1 Reload 'Selected Devices' check box

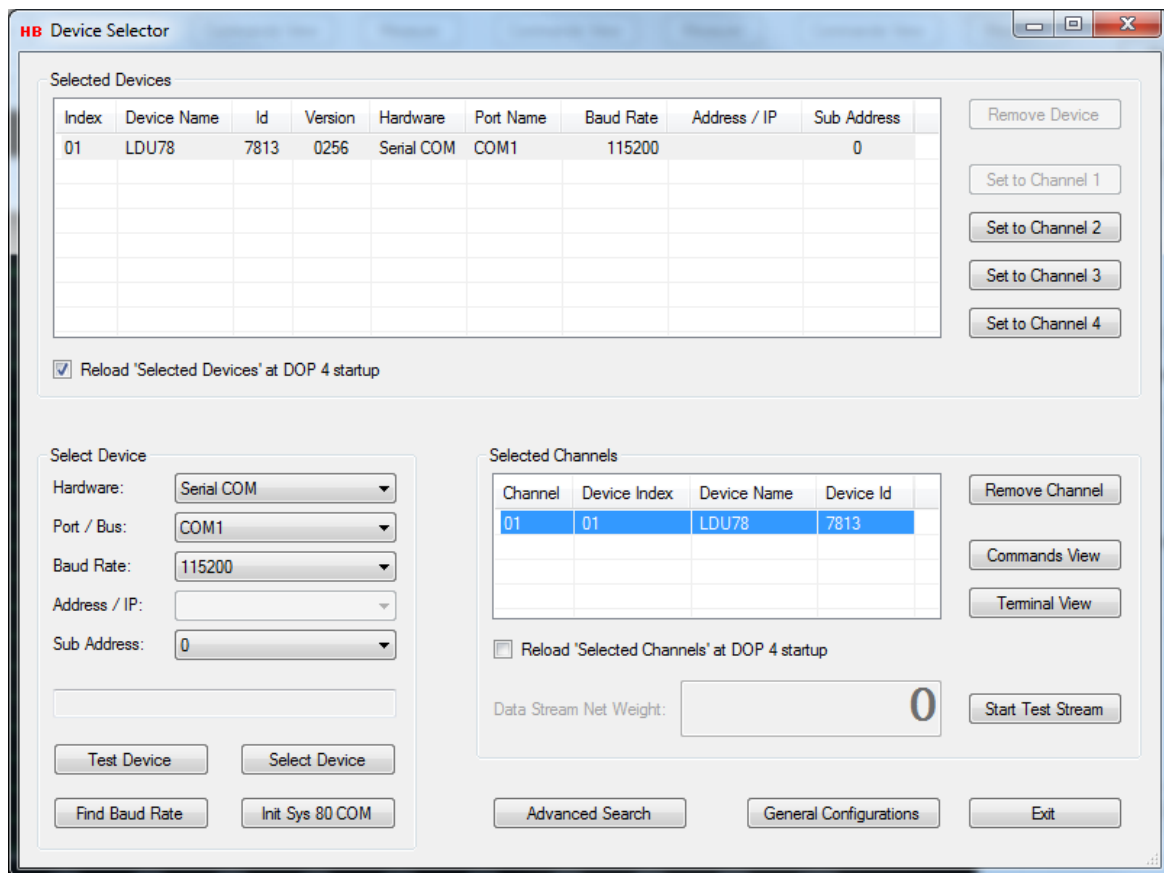
By checking the "Reload 'Selected Devices' at DOP 4 startup" checkbox, the H&B devices currently listed in the "Selected Devices" list view will be reloaded into the list view next time the DOP 4 application is started.

At next startup, just select a channel for a device and the "Device Selector" dialog can be exited.

☒ Reload 'Selected Devices' at DOP 4 startup

Be sure that the H&B devices in the "Selected Devices" list view at reload of the DOP 4 application are connected to the defined port and addresses if they are going to be assigned to a device channel.

### 3.3 Selected Channels



By selecting one of the four “Set to Channel x” buttons in the “Selected Devices” group box, the H&B device with the highlighted device description in the “Selected Devices” list view, will be assigned to the associated channel.

The device description for an H&B device assigned to a free channel will be added to the “Selected Channels” list view.

A given H&B device can be assigned to one or more of the free channels.

When one or more devices are assigned to several channels listed in the “Selected Channels” list view, a specific device description for a given channel in the “Selected Channels” list view can be highlighted by clicking on the line describing the assigned device.

To remove a highlighted device from the “Selected Channels” list view, select the “Remove Channel” button in the “Selected Channels” group box.

To access the “Commands View” and “Terminal View” dialogs for a specific highlighted device description, select the “Commands View” or the “Terminal View” button.

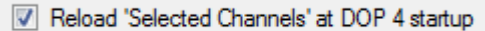
For a detailed description of the “Commands View” and “Terminal View” dialogs, refer to the specific sections covering these dialogs.

A “Terminal View” dialog for devices having Profibus interface is currently not available, and the “Terminal View” button will in this case be disabled.

The “Commands View” and “Terminal View” dialogs can also be accessed from popup menus in the main window.

### 3.3.1 Reload 'Selected Channels' check box

By checking the "Reload 'Selected Channels' at DOP 4 startup" checkbox, the H&B devices currently listed in the "Selected Channels" list view will be reloaded into the list view and opened, next time the DOP 4 application is started.

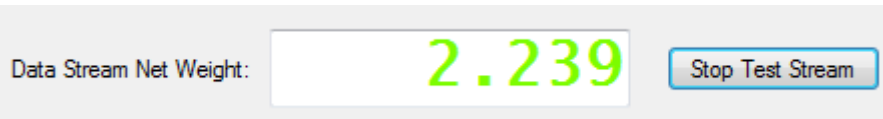


Be sure that the H&B devices in the "Selected Channels" list view at reload of the DOP 4 application are connected to the defined port and addresses if they are going to be assigned to a device channel.

### 3.3.2 Test net weight streaming

The net weight streaming for a highlighted channel description can be tested by selecting the "Start Test Stream" button in the "Selected Channels" group box.

In the "Data Stream Net Weight" field the current net weight is displayed.



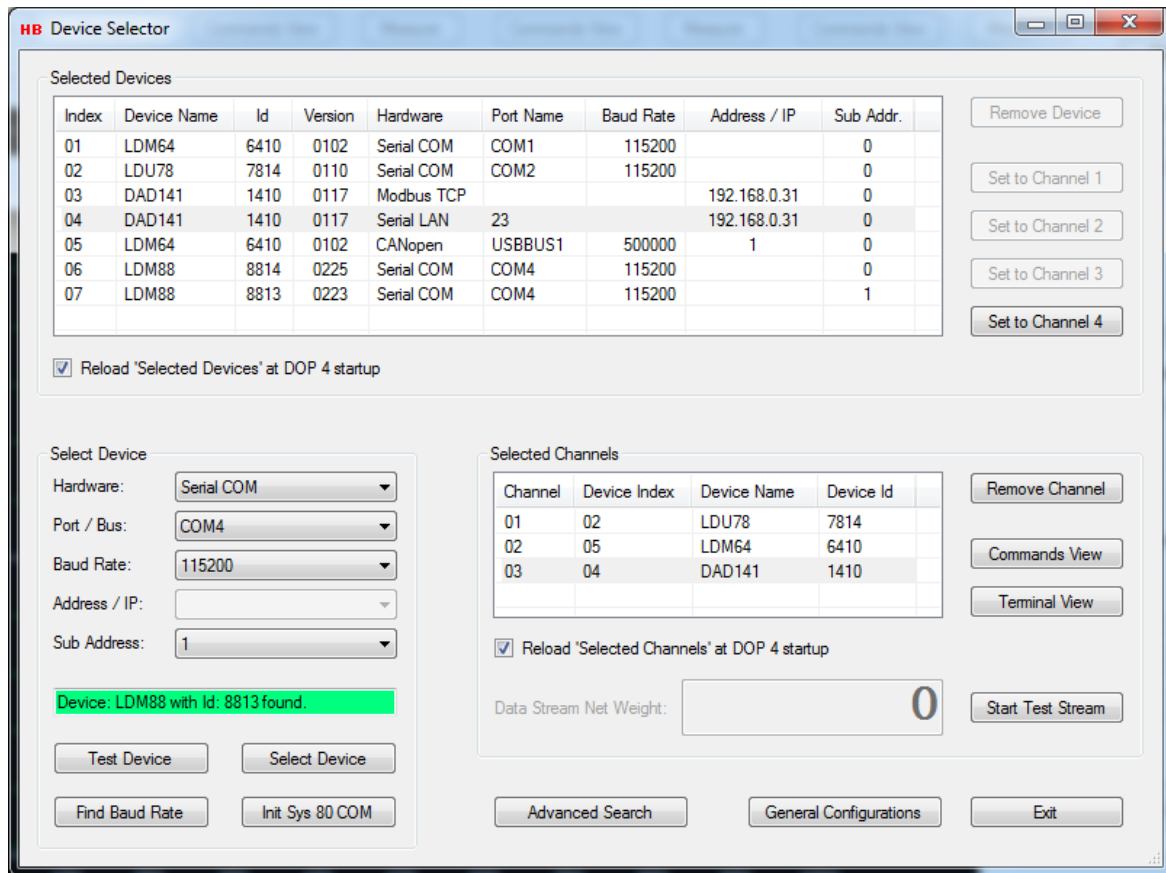
Data Stream Net Weight: 2.239 Stop Test Stream

By selecting the "Stop Test Stream" button, the button text "Start Test Stream" will change to "Stop Test Stream". Select the button again to stop the net weight data streaming.

To be able to watch streamed weight values from an H&B device using a serial COM interface for communication, the value of the "DX" parameter for the device must be set to "1" (full duplex).

Read more about how to change command parameters in the section covering the "Commands View" dialog.

The figure below illustrates how a lot of different H&B devices can be selected and how a part of these devices can be set to a specific device channel.



To access the "Advanced Search" or the "General Configuration" dialogs, select the "Advanced Search" or the "General Configuration" buttons.

For a detailed description of the "Advanced Search" and "General Configuration" dialogs, refer to the specific sections covering these dialogs.

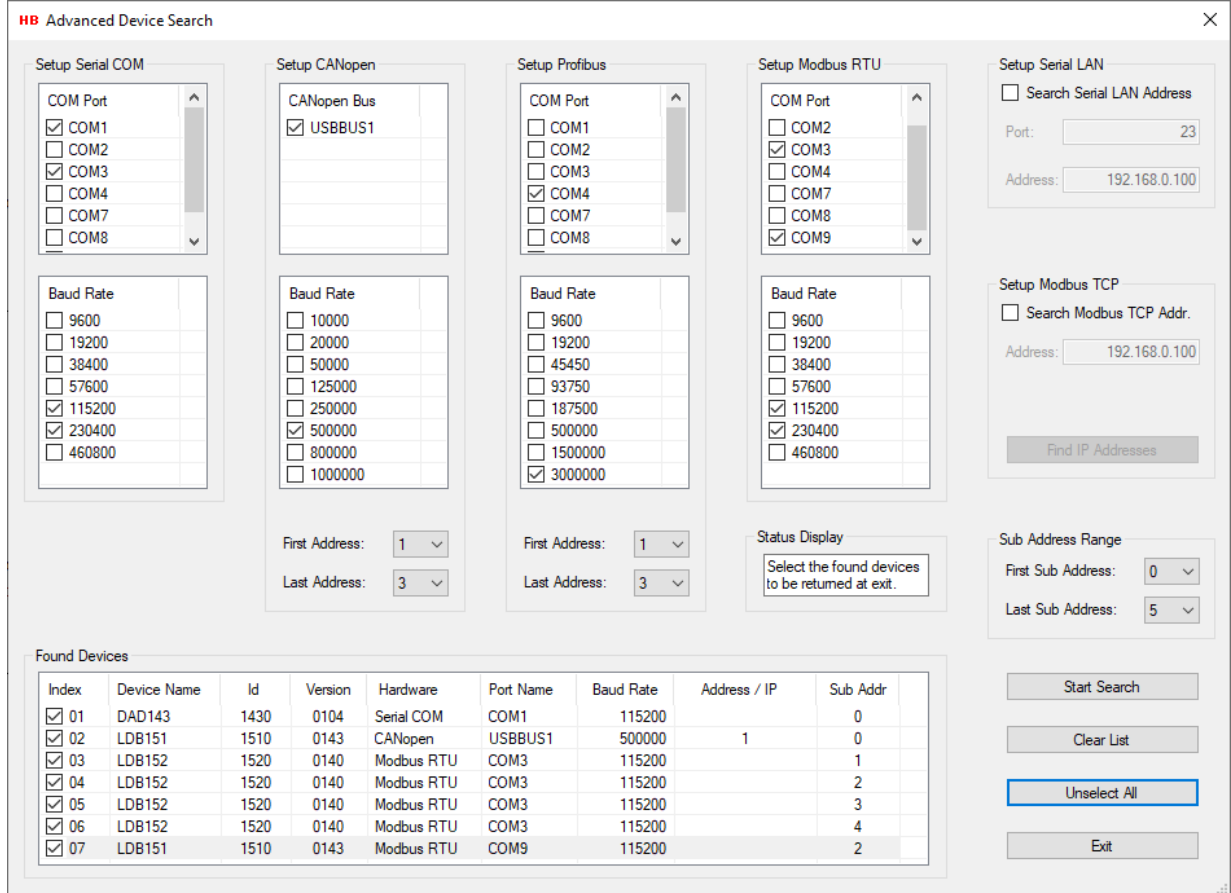
### 3.4 Exit

Selecting the "Exit" button will close the "Device Selector" dialog and return to the main menu.

## 4 Advanced Search

From the “Advanced Search” dialog it’s possible to do a search for devices connected to, or reachable from the PC on which the DOP 4 application is running.

By selecting from several communication setup parameters, a search for H&B devices with different hardware interfaces can be started.



**HB Advanced Device Search**

**Setup Serial COM**

COM Port: ☒ COM1, ☐ COM2, ☒ COM3, ☐ COM4, ☐ COM7, ☐ COM8

Baud Rate: ☐ 9600, ☐ 19200, ☐ 38400, ☐ 57600, ☒ 115200, ☒ 230400, ☐ 460800

**Setup CANopen**

CANopen Bus: ☒ USBBUS1

Baud Rate: ☐ 10000, ☐ 20000, ☐ 50000, ☐ 125000, ☐ 250000, ☒ 500000, ☐ 800000, ☐ 1000000

First Address: 1, Last Address: 3

**Setup Profibus**

COM Port: ☐ COM1, ☐ COM2, ☐ COM3, ☒ COM4, ☐ COM7, ☐ COM8

Baud Rate: ☐ 9600, ☐ 19200, ☐ 45450, ☐ 93750, ☐ 187500, ☐ 500000, ☐ 1500000, ☒ 3000000

First Address: 1, Last Address: 3

**Setup Modbus RTU**

COM Port: ☐ COM2, ☒ COM3, ☐ COM4, ☐ COM7, ☐ COM8, ☒ COM9

Baud Rate: ☐ 9600, ☐ 19200, ☐ 38400, ☐ 57600, ☒ 115200, ☒ 230400, ☐ 460800

**Setup Serial LAN**

☐ Search Serial LAN Address

Port: 23, Address: 192.168.0.100

**Setup Modbus TCP**

☐ Search Modbus TCP Addr.

Address: 192.168.0.100

Find IP Addresses

**Status Display**

Select the found devices to be returned at exit.

**Sub Address Range**

First Sub Address: 0, Last Sub Address: 5

**Found Devices**

Index	Device Name	Id	Version	Hardware	Port Name	Baud Rate	Address / IP	Sub Addr
<input checked="" type="checkbox"/> 01	DAD143	1430	0104	Serial COM	COM1	115200		0
<input checked="" type="checkbox"/> 02	LDB151	1510	0143	CANopen	USBBUS1	500000	1	0
<input checked="" type="checkbox"/> 03	LDB152	1520	0140	Modbus RTU	COM3	115200		1
<input checked="" type="checkbox"/> 04	LDB152	1520	0140	Modbus RTU	COM3	115200		2
<input checked="" type="checkbox"/> 05	LDB152	1520	0140	Modbus RTU	COM3	115200		3
<input checked="" type="checkbox"/> 06	LDB152	1520	0140	Modbus RTU	COM3	115200		4
<input checked="" type="checkbox"/> 07	LDB151	1510	0143	Modbus RTU	COM9	115200		2

Start Search, Clear List, Unselect All, Exit

### 4.1 Setup Serial COM search

In the “Setup Serial COM” group box, the criteria for searching after H&B devices connected via a serial COM interface is set.

Select the COM ports and the baud rates for which the search should be performed by checking the corresponding check boxes. At least one COM port and one baud rate must be selected to enable a search in the “Serial COM” group.

Also select the sub address range from the “Sub Address Range” group box for the search. At least a range of one sub address must be specified.

## 4.2 Setup CANopen search

In the "Setup CANopen" group box, the criteria for searching after H&B devices connected via a CANopen interface is set.

Select the CANopen Bus and the baud rates for which the search should be performed by checking the corresponding check boxes. At least one COM port and one baud rate must be selected to enable a search in the "CANopen" group.

Select the CANopen address range for the search. At least a range of one address must be specified.

Also select the sub address range from the "Sub Address Range" group box for the search. At least a range of one sub address must be specified.

## 4.3 Setup Profibus search

In the "Setup Profibus" group box, the criteria for searching after H&B devices connected via a Profibus interface is set.

Select the COM ports and the baud rates for which the search should be performed by checking the corresponding check boxes. At least one COM port and one baud rate must be selected to enable a search in the "Profibus" group.

Select the Profibus address range for the search. At least a range of one address must be specified.

Also select the sub address range from the "Sub Address Range" group box for the search. At least a range of one sub address must be specified.

## 4.4 Setup Modbus RTU search

In the "Setup Modbus RTU" group box, the criteria for searching after H&B devices connected via a Modbus RTU interface is set.

Select the COM ports and the baud rates for which the search should be performed by checking the corresponding check boxes. At least one COM port and one baud rate must be selected to enable a search in the "Modbus RTU" group.

Also select the sub address range from the "Sub Address Range" group box for the search. At least a range of one sub address must be specified.

## 4.5 Setup Serial LAN search

In the "Setup Serial LAN" group box, the criteria for searching after H&B devices connected via a serial LAN interface is set.

Check the "Search Serial LAN Address" check box to include serial LAN interfaces in the search for H&B devices.

Define the Ethernet port and address for which to search for a device. No possibilities for range setup here.

Also select the sub address range from the "Sub Address Range" group box for the search. At least a range of one sub address must be specified.

## 4.6 Setup Modbus TCP search

In the "Setup Modbus TCP" group box, the criteria for searching after H&B devices connected via an Ethernet Modbus interface is set.

Check the "Search Modbus Address" check box to include Ethernet Modbus interfaces in the search for H&B devices.

Define the Ethernet address for which to search for a device. No possibilities for range setup here.

Also select the sub address range from the "Sub Address Range" group box for the search. At least a range of one sub address must be specified.

By selecting the "Find IP Address" button, H&B devices with Ethernet interface will report their address back to the DOP 4 application. If one or more devices are found, the "List" dropdown box will appear containing the found addresses to select from.

## 4.7 Sub Address Range

In the "Sub Address Range" group box, the general sub addresses to be search for are defined. Set the minimum and maximum address range selecting from the "First Sub Address" and the "Last Sub Address" drop down boxes. The sub address range selection will be used for all selected device interfaces.

## 4.8 Status Display

In the "Status Display" group box information and direction for start search, ongoing search and end of search is displayed. When a device search is ongoing information about the progress is indicated in this display.

## 4.9 Found Devices

In the list view of the "Found Devices" group box, the found devices are listed with device interface information such as device names and port names.

An empty check box is attached to each of the found devices. By checking this check box, the selected device will be added to the "Selected Devices" list view in the "Device Selector" dialog if not already in the list view when the "Advanced Device Search" is exited.

## 4.10 Start Search

By selecting the "Start Search" button the search for devices will be started with the search criteria setup from the device interfaces boxes and the sub address range. The button text will be changed to "Stop Search" and the search for devices will be stopped by selecting the button while a device search is ongoing.

## 4.11 Clear List

By selecting the "Clear List" button the "Found Devices" list view will be cleared.

## 4.12 Select All

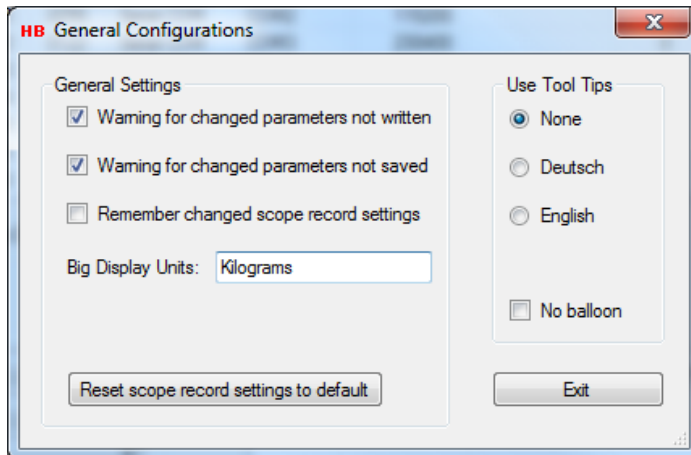
By selecting the "Select All" button the check boxes for all the found devices in the "Found Devices" list view will be checked or unchecked depending on the state of the button.

## 4.13 Exit

By selecting the "Exit" button the "Advanced Device Search" dialog will be closed and all the of the found devices with their check boxes checked will be added to the "Selected Devices" list view in the "Device Selector" dialog if not already there.

## 5 General Configuration

In the "General Configuration" dialog, various general settings and configurations can be selected.



### 5.1 General Settings

In the "General Settings" group box it can be determined if a warning should be given if leaving a dialog with changed parameters without the "Write" button has been selected.

It can be determined if a warning should be given if leaving a dialog with changed parameters without the "Save" button has been selected.

It can be determined if scope parameters set in the "Scope Settings" group boxes in the main menu and measurement dialogs should be remembered for the next DOP 4 session.

By selecting the "Reset scope record settings to default" the "Scope Settings" group boxes will be set to their default values.

A text by own choice can be written into the "Big Display Units" field indicating the kind of units of the value shown in the display in the "Display Panel" Dialog. The display units text is showed in the header of the "Display Panel" dialog if present.

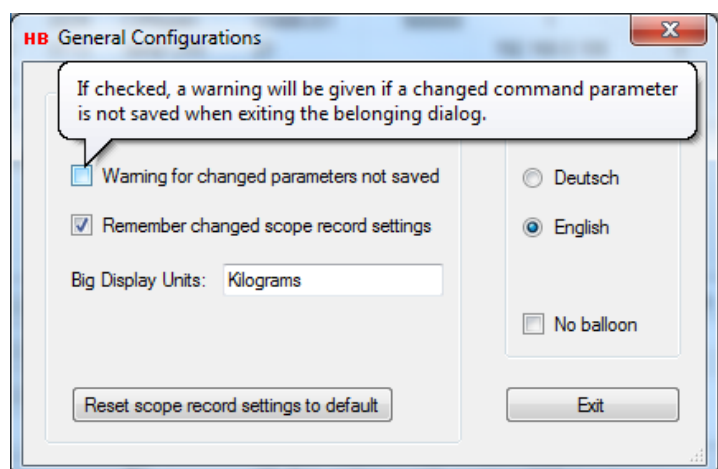
### 5.2 Use Tool Tips

In the "Use Tool Tips" group box it can be determined if a Tool Tip text should be shown when resting the mouse cursor over buttons and text fields all over the DOP 4 application.

The tool tip text will explain what will happen if a given button is selected or what the content of a text field means.

Currently tool tips texts are available in the English and the German language.

If the "No balloon" check box is unchecked, the tool tip will appear as shown in the figure to the right. If checked it will appear in a simple text box.



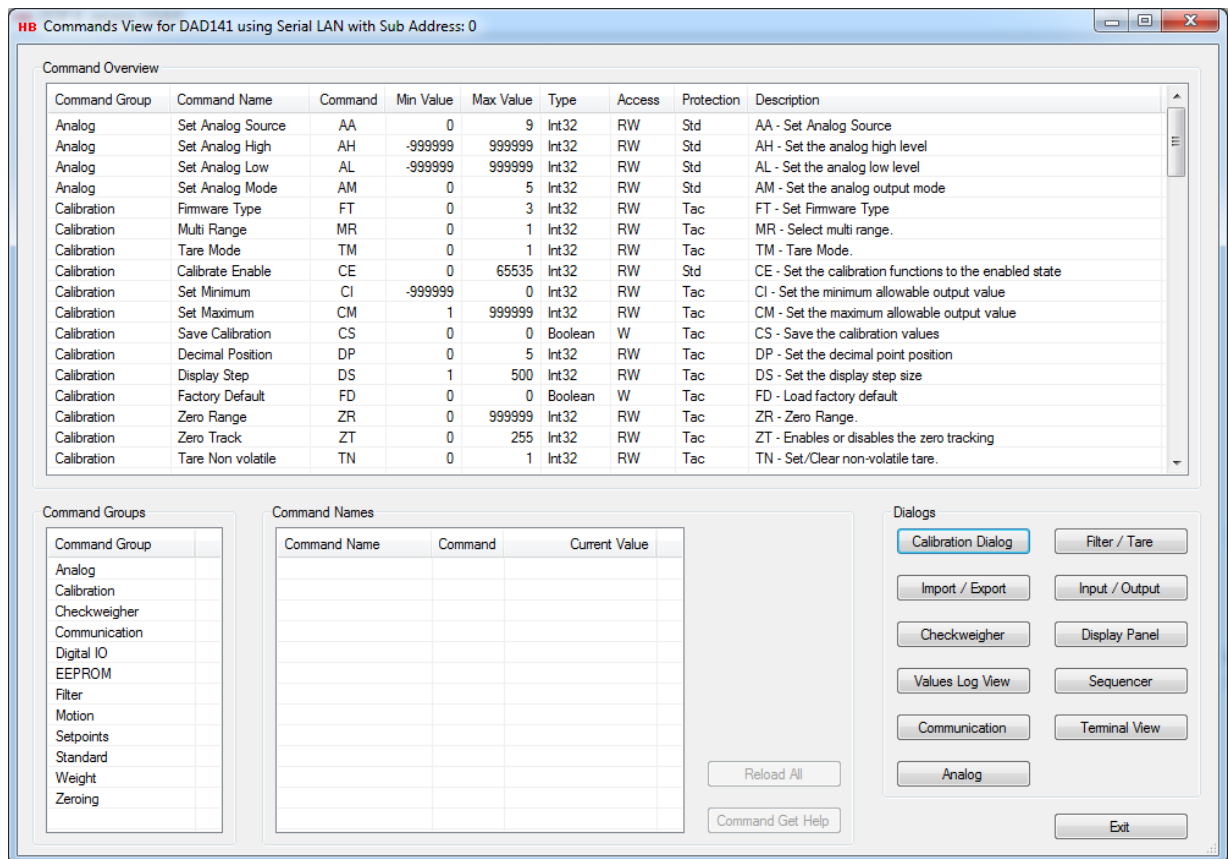
## 6 Commands View

In the "Commands View" dialog the command parameters valid for the currently selected H&B device 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.

If available, use the Terminal View for access of special command parameters not supported by the "Commands View".



## 6.1 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.

By double clicking on a command description in the "Command Overview" list view, an online help web page describing the characteristics for the selected command will appear.

Remark: The help option requires internet connection.

Command Group	Command Name	Command	Min Value	Max Value	Type	Access	Protection	Description
Calibration	Factory default	FD	0	0	Boolean	W	Tac	FD - Load factory default
Checkweigher	Trigger	TR	0	0	Boolean	W	Std	TR - start the measuring cycle in the same way as the h...
Communication	Set Address	AD	0	63	Int32	RW	Std	Ad - Read/modify the address (0-255)
Communication	Set Baudrate	BR	115200	115200	Int32	RW	Std	BR - Read/modify the baudrate
Communication	Duplex mode	DX	0	1	Int32	RW	Std	DX - select half(0) or full(1) duplex communication
DigitalIO	Read input	IN	0	1111	String	R	Std	IN - Read the status of the input channels
DigitalIO	Set output	IO	0	1111	String	RW	Std	IO - Read/Modify the status of the output channels
DigitalIO	IO mask	IM	0	1111	String	RW	Std	IM - Set the IO mask
EEPROM	Save dose	SD	0	0	Boolean	W	Std	SD - Save the dosing set-up parameters
EEPROM	Save params	WP	0	0	Boolean	W	Std	WP - Save the device set-up parameters
Filling	Start Cycle	SC	0	0	Boolean	W	Std	SC - Starts the Filling program.
Filling	Abort Cycle	AC	0	0	Boolean	W	Std	AC - Aborts the Filling program.
Filling	Dose Info	DI	0	0	Int32	R	Std	DI - Get the filling status
Filling	Get Dosed	GD	0	262143	Single	R	Std	GD - Get the last filling net result
Filling	Pre-fill mode	PD1	0	15	Int32	RW	Std	PD1 - Pre-fill mode.
Filling	In-flight correction	PD2	0	50	Int32	RW	Std	PD2 - Correction factor for in-flight value in percent. Ra...
Filling	Zero check time	PD3	0	65535	Int32	RW	Std	PD3 - Time over which the zero check average will be ...

## 6.2 Command Groups

By clicking on a command group description in the "Command Groups" list view, the selected command group will be highlighted and all of 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.

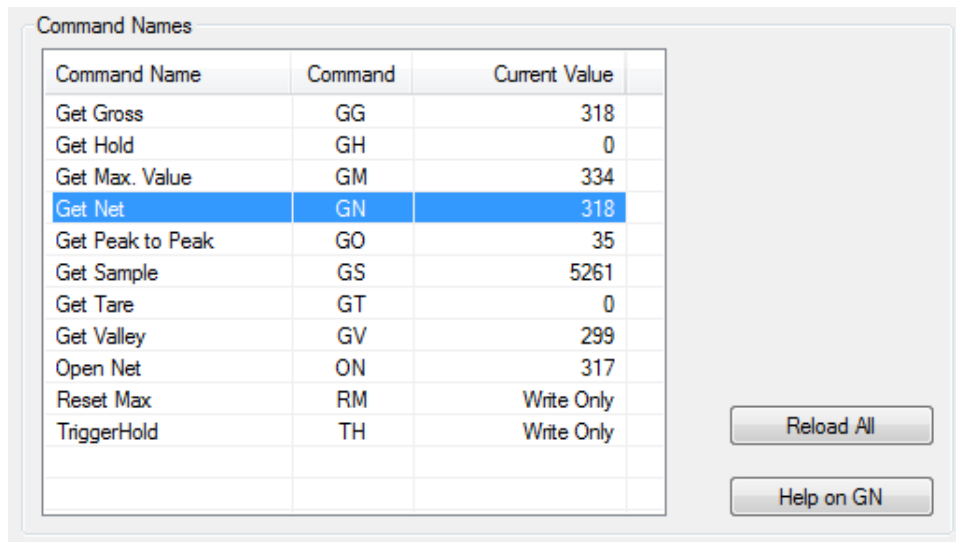
Command Group	
Analog	
Calibration	
Checkweigher	
Communication	
DigitalIO	
EEPROM	
Filter	
Motion	
Setpoints	
Standard	
Weight	
Zeroing	

### 6.3 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 device.



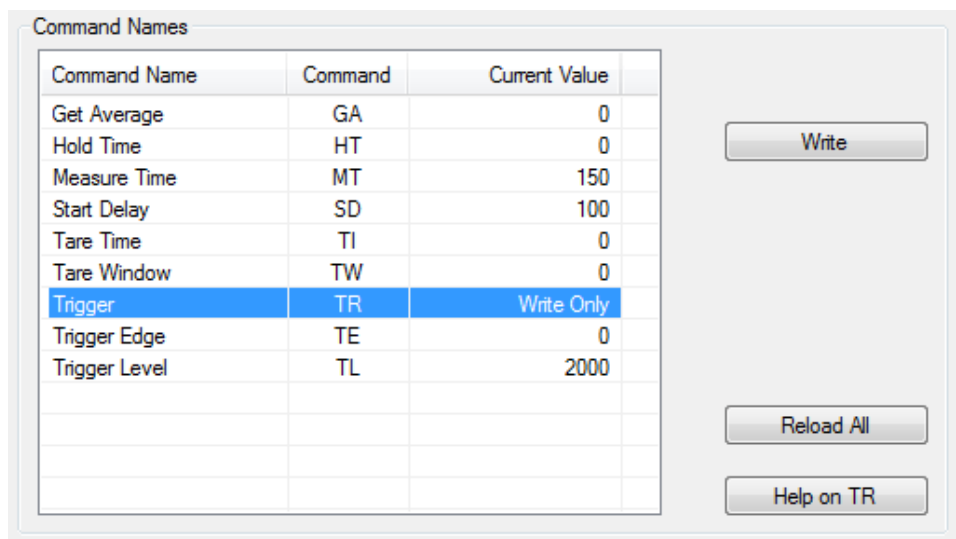
Command Name	Command	Current Value
Get Gross	GG	318
Get Hold	GH	0
Get Max. Value	GM	334
Get Net	GN	318
Get Peak to Peak	GO	35
Get Sample	GS	5261
Get Tare	GT	0
Get Valley	GV	299
Open Net	ON	317
Reset Max	RM	Write Only
TriggerHold	TH	Write Only

Buttons: Reload All, Help on GN

By selecting the command help button or double clicking on a command in the "Command Names" list view, an online help web page describing the characteristics for the selected command will appear. The help option requires internet connection.

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

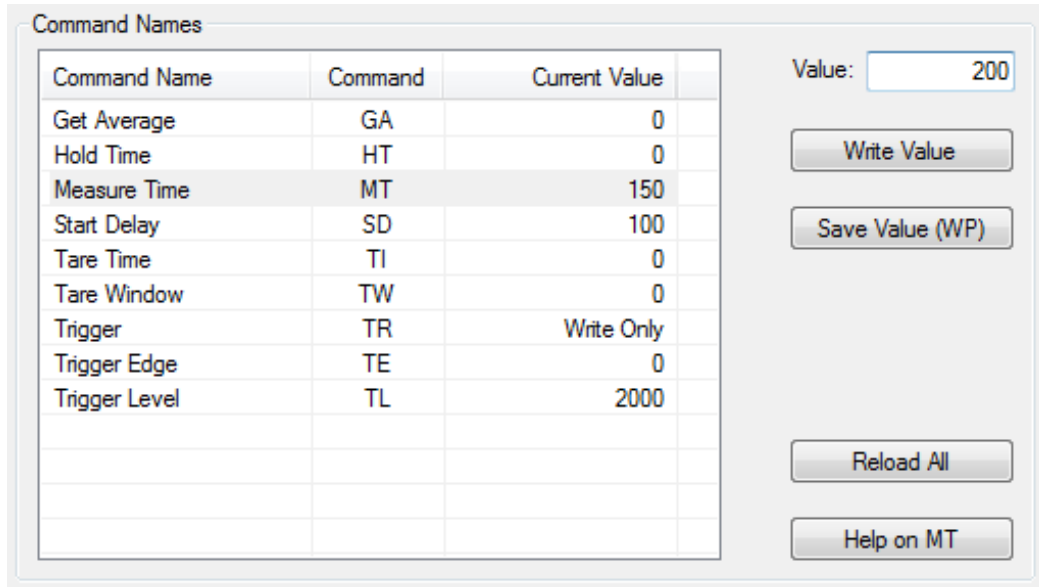
If a command parameter is a Boolean writeable but requires no value to be sent with the command parameter, only the "Write" button with no value field will be enabled.



Command Name	Command	Current Value
Get Average	GA	0
Hold Time	HT	0
Measure Time	MT	150
Start Delay	SD	100
Tare Time	TI	0
Tare Window	TW	0
Trigger	TR	Write Only
Trigger Edge	TE	0
Trigger Level	TL	2000

Buttons: Write, Reload All, Help on TR

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 user, the "Write Value" and the "Save Value" buttons will be enabled. The modified value can now be written or saved to the device by selecting the "Write Value" or the "Save Value" button as explained below.



Command Names

Command Name	Command	Current Value
Get Average	GA	0
Hold Time	HT	0
Measure Time	MT	150
Start Delay	SD	100
Tare Time	TI	0
Tare Window	TW	0
Trigger	TR	Write Only
Trigger Edge	TE	0
Trigger Level	TL	2000

Value:

Write Value

Save Value (WP)

Reload All

Help on MT

If it's possible to save a command value to the EEPROM after it's written to the device, 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 device. 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 device.

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

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

For the writeable command parameters in the calibration group, a “Calibrate Enable” command must be sent to the device 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 device.

Command Names

Command Name	Command	Current Value
Absolute Gain	AG	0.1953
Absolute Zero	AZ	0.0347
Calibrate Enable	CE	8
Calibrate Gain	CG	2000
Calibrate Zero	CZ	Write Only
Decimal Position	DP	0
Display Step	DS	1
Factory Default	FD	Write Only
Save Calibration	CS	Write Only
Set Maximum	CM	99999
Set Minimum	CI	-9000
Zero Range	ZR	2000
Zero Track	ZT	1

Value: 
  
Write Value
  
Save Value (CS)
  
Calibrate Enable
  
Reload All
  
Help on DP

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 device.

Command Names

Command Name	Command	Current Value
Absolute Gain	AG	0.1953
Absolute Zero	AZ	0.0347
Calibrate Enable	CE	8
Calibrate Gain	CG	2000
Calibrate Zero	CZ	Write Only
Decimal Position	DP	0
Display Step	DS	1
Factory Default	FD	Write Only
Save Calibration	CS	Write Only
Set Maximum	CM	99999
Set Minimum	CI	-9000
Zero Range	ZR	2000
Zero Track	ZT	1

Value: 
  
Write Value
  
Save Value (CS)
  
Reload All
  
Help on DP

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 H&B device by selecting the "Save Value (CS)" button. All the changed calibration values will be stored to the EEPROM of the device.

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 device 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 device. This way it's possible to escape from a messy situation where the command parameters status of the device is unclear.

Command Names

Command Name	Command	Current Value
Absolute Gain	AG	0.1953
Absolute Zero	AZ	0.0347
Calibrate Enable	CE	9
Calibrate Gain	CG	2000
Calibrate Zero	CZ	Write Only
Decimal Position	DP	1
Display Step	DS	1
Factory Default	FD	Write Only
Save Calibration	CS	Write Only
Set Maximum	CM	99999
Set Minimum	CI	-9000
Zero Range	ZR	2000
Zero Track	ZT	1

Value:

Write Value

Save Value (CS)

Calibrate Enable

Reload All

Help on DP

## 6.4 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 exporting and importing selected command parameters to one or more H&B devices, the special dialog "Import / Export" can be used.

For changing setpoints and digital IO command parameter values and monitoring input / output values the special dialog "Input / Output" can be used.

For changing checkweigher or filling command parameter values the special dialog "Checkweigher" or "Filling" dialog depending on the currently selected H&B device can be used.

For having a big weight display to be watched from distance, the "Display Panel" dialog can be used.

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

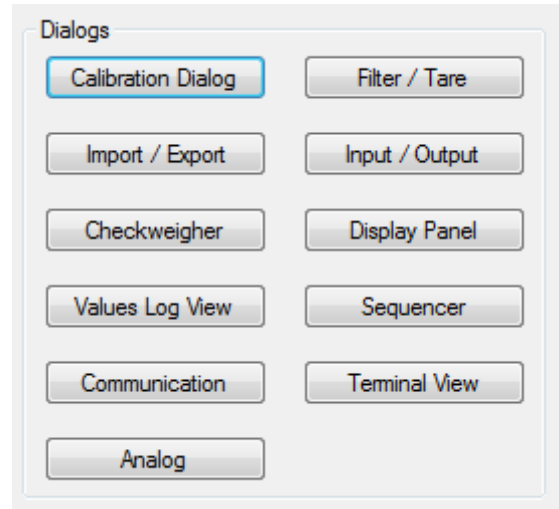
For sending a sequence of specific commands to the current device with a controlled delay between the defined commands the "Sequencer" dialog can be used.

For setting up communication parameters for serial communication devices, the "Communication" dialog can be used. (Only for devices connected by Serial COM or Serial LAN interface).

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

For setting up analog parameters for a DAS or DAD device, the "Analog" dialog can be used.

For detailed information on how to use the different dialogs, refer to the sections covering these issues. For the "Analog" dialog, refer to the "Mass Flow / Analog Dialog" section.



## 7 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" can also be accessed from popup menus in the main window.

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

### 7.1 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.

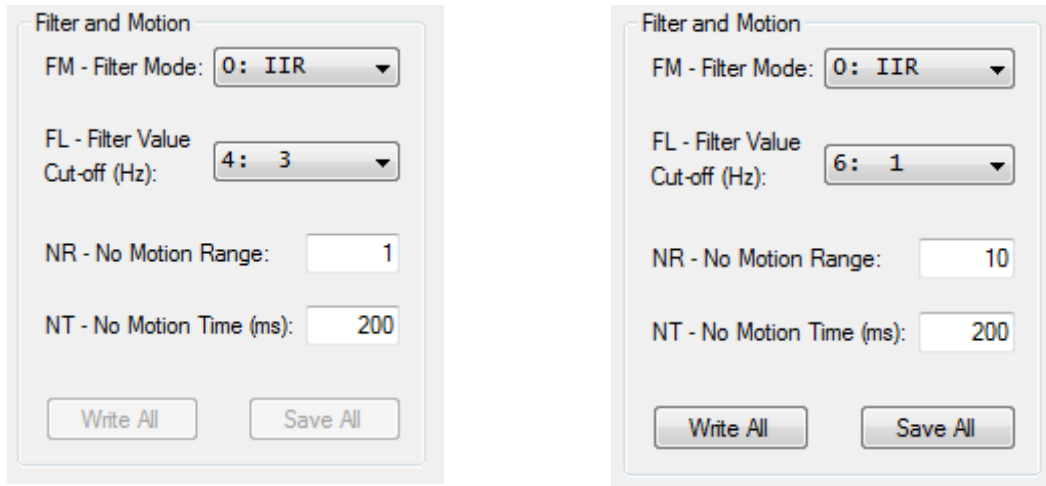
A stable signal from the load cell is indicated by a green square and an unstable signal is indicated by a red square. The sensitivity for having a stable signal can be adjusted by the "No Motion" command parameters and the Filter value.

### 7.2 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.

## 7.3 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.



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.

### 7.3.1 Write Settings

To use the changed filter and motion settings for further calibration it 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 device.

### 7.3.2 Save settings

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

## 7.4 Calibration methods

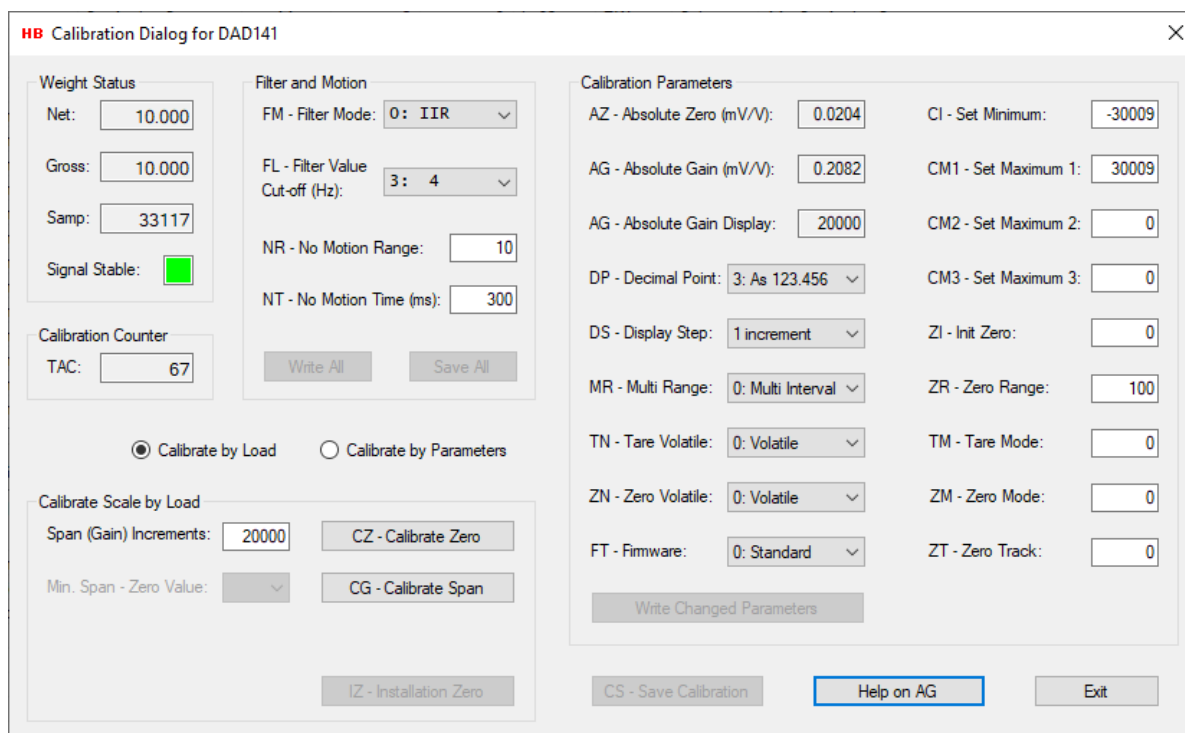
A calibration can be performed by a weight load on a scale or by entering calibration data manually.

### 7.4.1 Calibrate by Load method

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

☒ Calibrate by Load    ☐ Calibrate by Parameters

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.



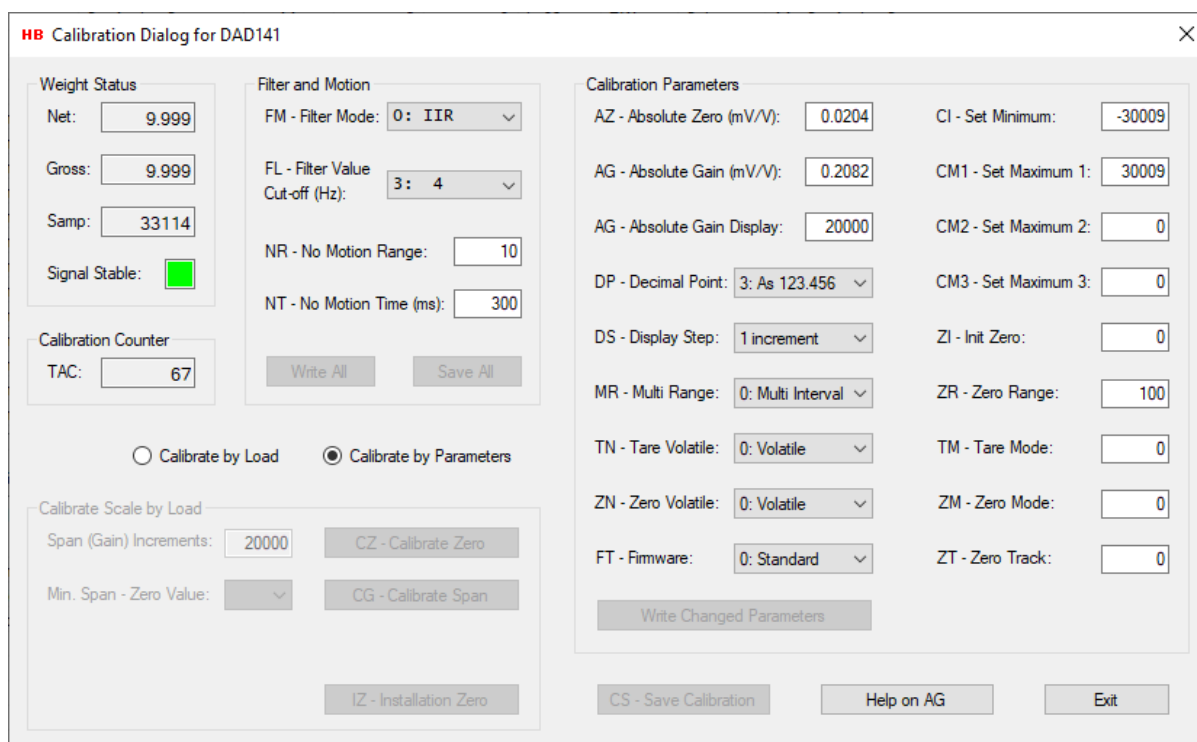
The calibration method "Calibrate by Load" is described in section covering the "Calibration by Weight Load".

### 7.4.2 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.

☐ Calibrate by Load     ☒ Calibrate by Parameters

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.



**HB Calibration Dialog for DAD141**

Weight Status  
 Net: 9.999  
 Gross: 9.999  
 Samp: 33114  
 Signal Stable: ■

Calibration Counter  
 TAC: 67

Filter and Motion  
 FM - Filter Mode: 0: IIR  
 FL - Filter Value Cut-off (Hz): 3: 4  
 NR - No Motion Range: 10  
 NT - No Motion Time (ms): 300  
 Write All Save All

Calibration Parameters

AZ - Absolute Zero (mV/V): 0.0204  
 AG - Absolute Gain (mV/V): 0.2082  
 AG - Absolute Gain Display: 20000  
 DP - Decimal Point: 3: As 123.456  
 DS - Display Step: 1 increment  
 MR - Multi Range: 0: Multi Interval  
 TN - Tare Volatile: 0: Volatile  
 ZN - Zero Volatile: 0: Volatile  
 FT - Firmware: 0: Standard

CI - Set Minimum: -30009  
 CM1 - Set Maximum 1: 30009  
 CM2 - Set Maximum 2: 0  
 CM3 - Set Maximum 3: 0  
 ZI - Init Zero: 0  
 ZR - Zero Range: 100  
 TM - Tare Mode: 0  
 ZM - Zero Mode: 0  
 ZT - Zero Track: 0

Write Changed Parameters

CS - Save Calibration Help on AG Exit

Calibrate Scale by Load  
 Span (Gain) Increments: 20000 CZ - Calibrate Zero  
 Min. Span - Zero Value: CG - Calibrate Span  
 IZ - Installation Zero

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

## 7.5 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 devices having a "seal switch" such as the DAD141 and the LDM64 device, remember to remove the seal switch if one is present.

### 7.5.1 Zero Calibration

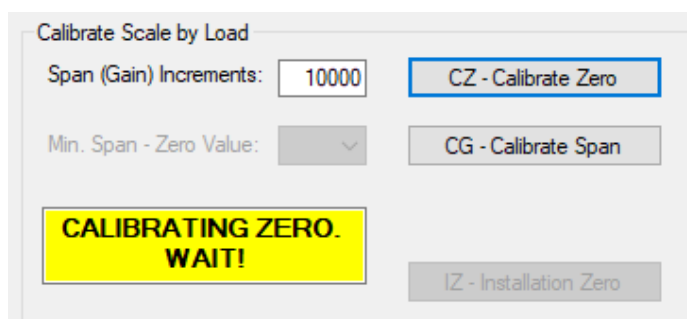
A calibration session starts by a calibration of the zero point.

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

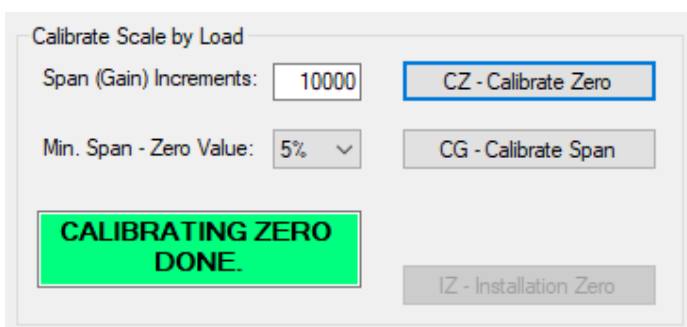
When ready for zero calibration, select the "CZ - Calibrate Zero" button. A message reminder about unloading the scale will appear. Confirm the message and the zero-point calibration will start.

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 10000, a "Min. Span - Zero Value" dropdown menu, and three buttons: "CZ - Calibrate Zero" (highlighted with a blue border), "CG - Calibrate Span", and "IZ - Installation Zero". A yellow message box in the bottom left corner displays "CALIBRATING ZERO. WAIT!".

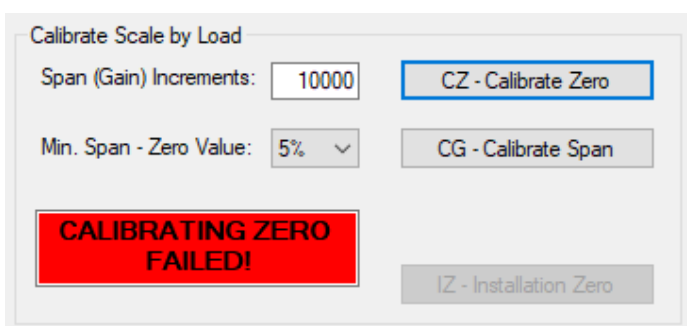


The screenshot shows the "Calibrate Scale by Load" interface after a successful calibration. The "Min. Span - Zero Value" dropdown menu is now set to 5%. A green message box in the bottom left corner displays "CALIBRATING ZERO DONE.". The other elements, including the "Span (Gain) Increments" field and buttons, remain the same.

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. A red message box in the bottom left corner displays "CALIBRATING ZERO FAILED!". The other elements, including the "Span (Gain) Increments" field and buttons, remain the same.

### 7.5.2 Span Calibration

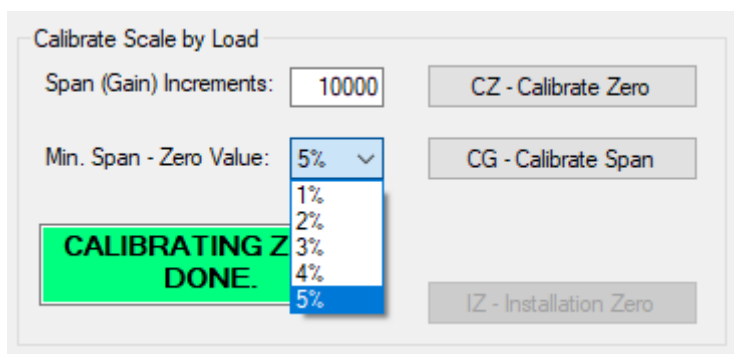
After the zero point has been calibrated successfully the span calibration procedure can be executed.

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. The 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 device under calibration and calculate the percentage value indicated in the "Min. Span - Zero Value" drop box.

Using the LDU 78.1 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 is 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.

Calibrate Scale by Load

Span (Gain) Increments: 10000

Min. Span - Zero Value: 5% ▾

**CALIBRATING SPAN. WAIT!**

CZ - Calibrate Zero

CG - Calibrate Span

IZ - Installation Zero

Calibrate Scale by Load

Span (Gain) Increments: 10000

Min. Span - Zero Value: 5% ▾

**CALIBRATING SPAN DONE.**

CZ - Calibrate Zero

CG - Calibrate Span

IZ - Installation Zero

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.

Calibrate Scale by Load

Span (Gain) Increments: 10000

Min. Span - Zero Value: 5% ▾

**CALIBRATING SPAN FAILED!**

CZ - Calibrate Zero

CG - Calibrate Span

IZ - Installation Zero

## 7.6 Calibration Parameters

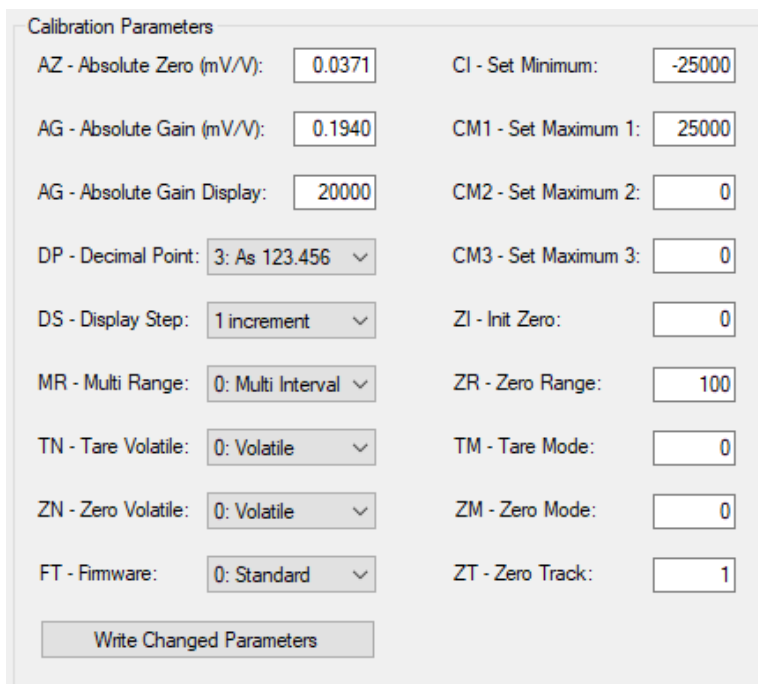
From the "Calibration Parameters" group box, the values of various calibration command parameters can be examined and changed.

The Calibration dialog is general for all types of H&B devices, so not all the calibration parameters are valid for all devices. Calibration parameters not valid for a given device will be disabled.

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 device.

The values will not be saved to the EEPROM, so if the changed calibration parameters are to be

used after device power off / on, it's necessary to save the settings into the EEPROM of the device by selecting the "CS - Save Calibration" button.




Calibration Parameters

AZ - Absolute Zero (mV/V):	0.0371	CI - Set Minimum:	-25000
AG - Absolute Gain (mV/V):	0.1940	CM1 - Set Maximum 1:	25000
AG - Absolute Gain Display:	20000	CM2 - Set Maximum 2:	0
DP - Decimal Point:	3: As 123.456	CM3 - Set Maximum 3:	0
DS - Display Step:	1 increment	ZI - Init Zero:	0
MR - Multi Range:	0: Multi Interval	ZR - Zero Range:	100
TN - Tare Volatile:	0: Volatile	TM - Tare Mode:	0
ZN - Zero Volatile:	0: Volatile	ZM - Zero Mode:	0
FT - Firmware:	0: Standard	ZT - Zero Track:	1

Write Changed Parameters

### 7.6.1 Set Linearization Points for LDU69

If the connected device is a LDU69 the button "Set Linearization Points" is visible in the "Calibration Parameters" group box.



Write Changed Parameters      Set Linearization Points

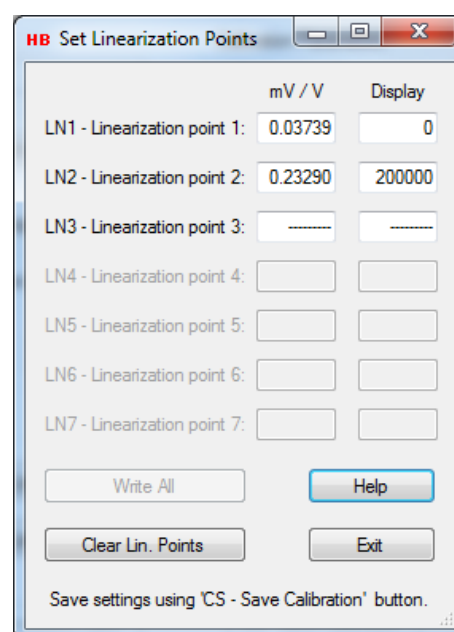
By selecting the "Set Linearization Points" button the "Set Linearization Points" dialog will be opened.

From this dialog it's possible to inspect and correct more than the two normal calibration points set by the CZ and CG commands.

To add a new linearization point, select the next free fields with the dashes on it and enter the new values. Select the "Write All" button and a new set of points can be entered and so on.

By selecting the "Clear Lin. Points" button, the linearization points setting can be set back to the default setup.

Remember to save the settings in the main calibration dialog.



HB Set Linearization Points

	mV / V	Display
LN1 - Linearization point 1:	0.03739	0
LN2 - Linearization point 2:	0.23290	200000
LN3 - Linearization point 3:	-----	-----
LN4 - Linearization point 4:		
LN5 - Linearization point 5:		
LN6 - Linearization point 6:		
LN7 - Linearization point 7:		

Write All      Help

Clear Lin. Points      Exit

Save settings using 'CS - Save Calibration' button.

### 7.6.2 Set Firmware Types for DAD141 / DAD142 and LDM64

If the connected device is a DAD141 / DAD142 or a LDM64 device, the field "FT – Firmware Type" is visible in the "Calibration Parameters" group box.



By changing the value of this field, it's possible to change the current firmware type of the device.

For the DAD141 / DAD142 device, the available firmware types are: Standard (Checkweigher), Filling, Drop Filling and Mass flow firmware types.

For the LDM64 device, the available firmware types are Standard (Checkweigher) and Filling firmware types.

When changing the firmware type value, the device must be removed from the channel list in the "Device Selector" dialog and reinserted after the value is stored in the Calibration dialog. The value should only be changed when the Calibration dialog is opened from "Commands View" via the "Device Selector" dialog.

Also, the device itself should be turned off and on after the change of firmware type.

### 7.6.3 Save Calibration

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

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



## 7.7 Help on Calibrate Command Parameters

If the user is connected to the internet, help on the different command parameters of the Calibration dialog can be obtained by selecting the "Help on (Command)" button.

On the "Calibrate Zero" or the "Calibrate Gain" help web page, the "Calibration Procedure" link can be selected for more information and hints for the calibration procedure.

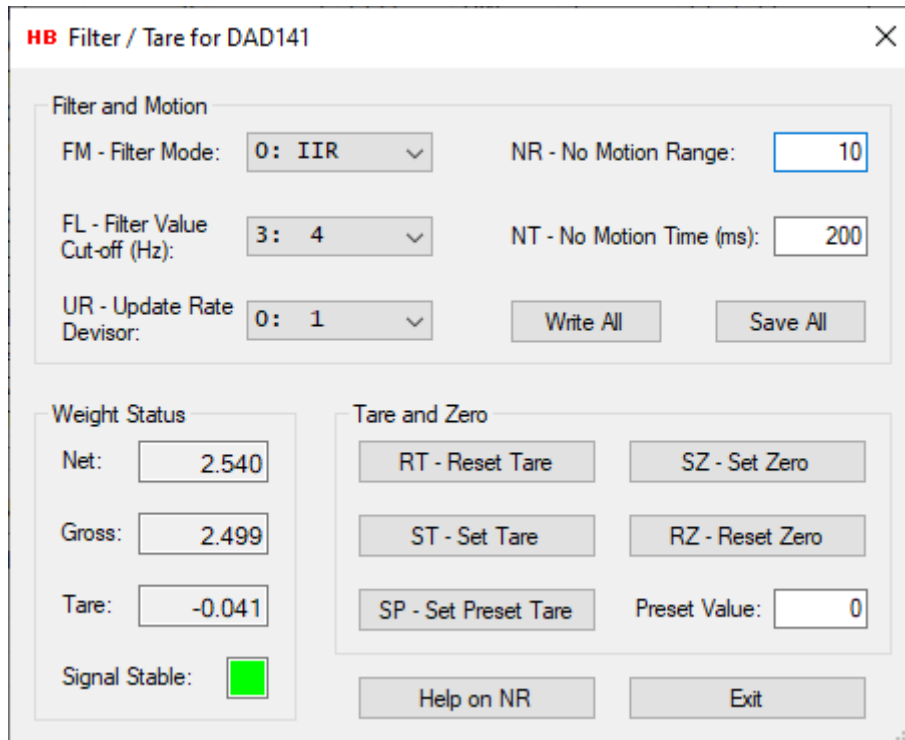
On the "Filter Value" help web page, the "General filter description" link can be selected for more information on the different values of filter setting commands.

## 8 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.

The "Filter / Tare" dialog can also be accessed from popup menus in the main window.



The dialog box is titled "HB Filter / Tare for DAD141". It contains two main sections: "Filter and Motion" and "Tare and Zero".

**Filter and Motion:**

- FM - Filter Mode: 0: IIR (dropdown)
- NR - No Motion Range: 10 (text box)
- FL - Filter Value Cut-off (Hz): 3: 4 (dropdown)
- NT - No Motion Time (ms): 200 (text box)
- UR - Update Rate Devisor: 0: 1 (dropdown)
- Buttons: Write All, Save All

**Weight Status:**

- Net: 2.540 (text box)
- Gross: 2.499 (text box)
- Tare: -0.041 (text box)
- Signal Stable: ☒ (checkbox)

**Tare and Zero:**

- Buttons: RT - Reset Tare, SZ - Set Zero, ST - Set Tare, RZ - Reset Zero, SP - Set Preset Tare, Preset Value: 0 (text box)
- Buttons: Help on NR, Exit

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.

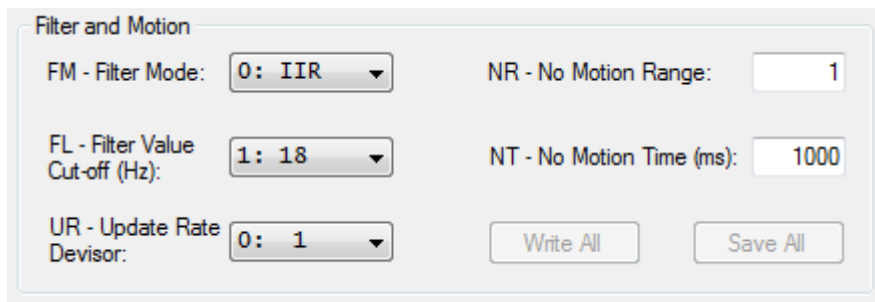
The Tare settings cannot be saved to the EEPROM. So, the tare settings will disappear after device power down/up.

The Set Preset Value will be stored directly to the EEPROM of the device.

## 8.1 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.

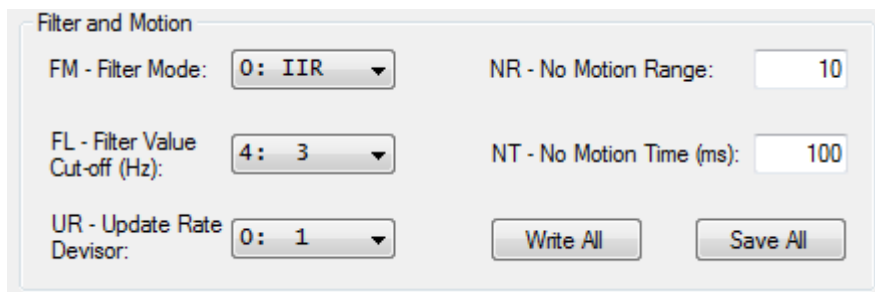


Filter and Motion	
FM - Filter Mode:	0: IIR
NR - No Motion Range:	1
FL - Filter Value Cut-off (Hz):	1: 18
NT - No Motion Time (ms):	1000
UR - Update Rate Divisor:	0: 1
<input type="button" value="Write All"/> <input type="button" value="Save All"/>	

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:	10
FL - Filter Value Cut-off (Hz):	4: 3
NT - No Motion Time (ms):	100
UR - Update Rate Divisor:	0: 1
<input type="button" value="Write All"/> <input type="button" value="Save All"/>	

### 8.1.1 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 device.

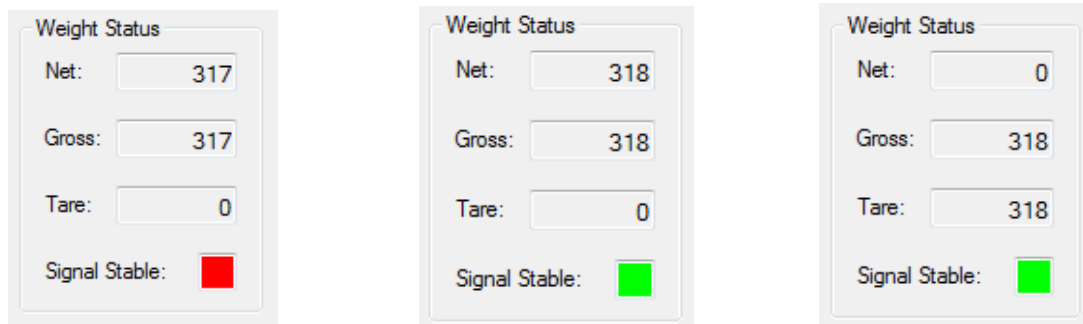
### 8.1.2 Save settings

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

## 8.2 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.



Net	Gross	Tare	Signal Stable
317	317	0	Red
318	318	0	Green
0	318	318	Green

## 8.3 Tare Settings

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

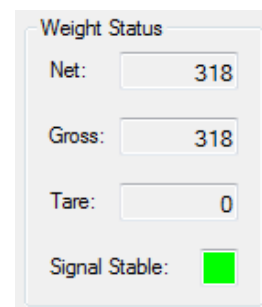


### 8.3.1 Reset Tare

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.



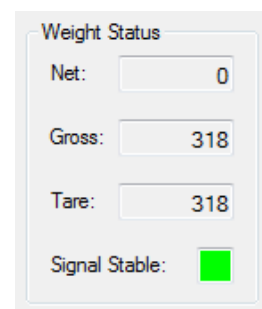
Net	Gross	Tare	Signal Stable
318	318	0	Green

### 8.3.2 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.

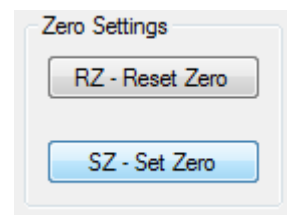
If the tare setting failed, a message box will appear saying that the tare setting went wrong. The unsuccessful setting can be caused by a too unstable scale. Try to adjust the parameters of the "Filter and Motion" check box as explained earlier in this section and retry.



Net	Gross	Tare	Signal Stable
0	318	318	Green

## 8.4 Zero Settings

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

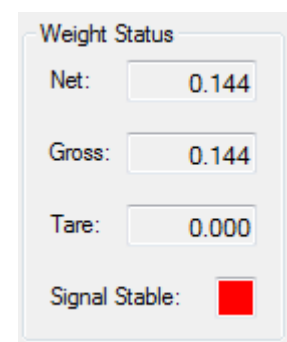


### 8.4.1 Reset Zero

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.

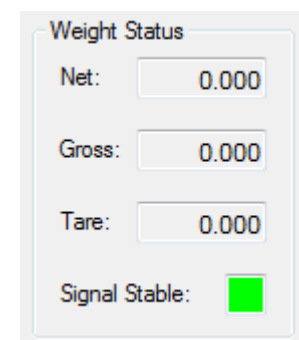


### 8.4.2 Set Zero

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" check box as explained earlier in this section and retry.



## 8.5 Help on (Command)

If the user is connected to the internet, selecting the help button "Help on (Command)" will give access to help on the currently highlighted command button or command text field. On the "Filter Value" help web page, the "General filter description" link can be selected for more information on the different values of filter setting commands.

## 9 Import / Export

The "Import / Export" dialog accessed from the "Commands View" dialog, is covering the most common importing, and exporting of command parameter values.

The command parameter values are by default read from the currently monitored device when entering the "Import / Export" dialog.

If a command parameter doesn't exist for the current device (Old Version) or the parameter value for some reason couldn't be read, the command parameter will be marked with a red color.

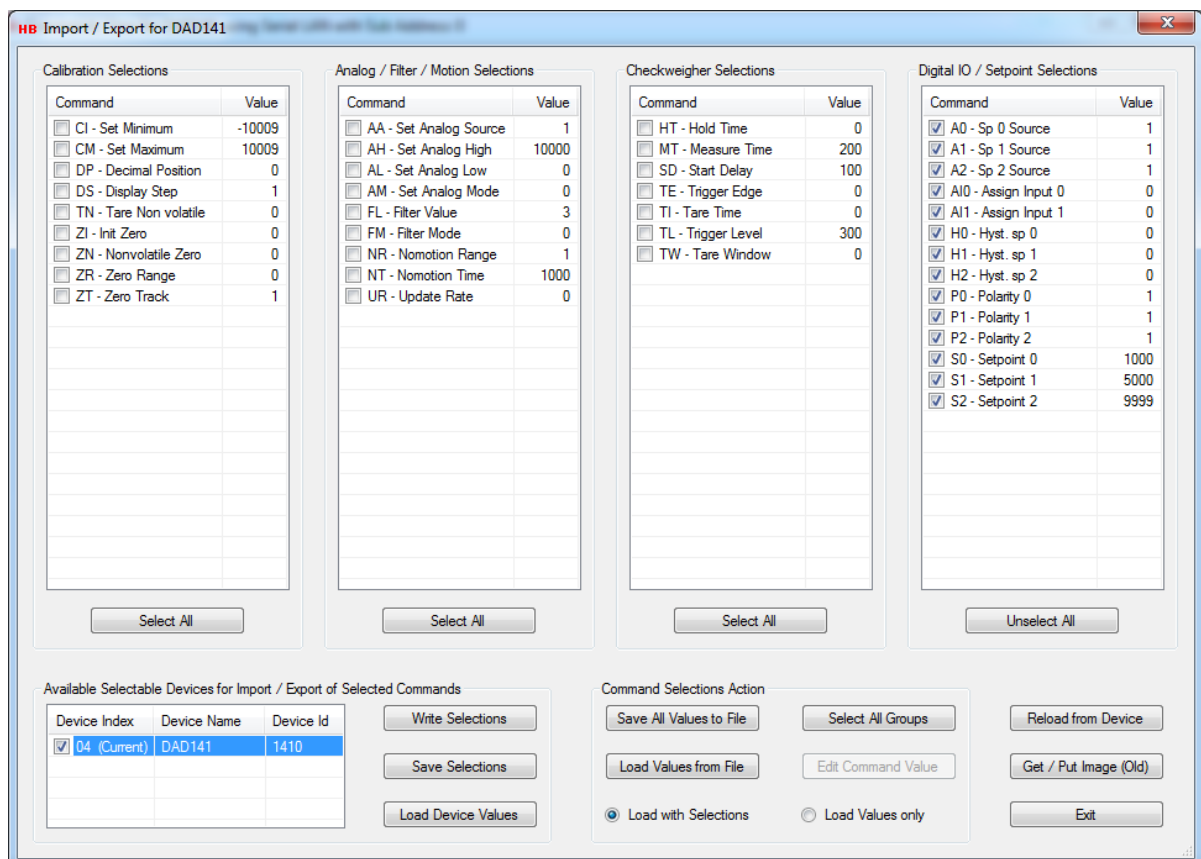
Different command parameter values can be selected depending on the connected H&B device and exported to one or more devices with the same ID as the currently monitored device.

The command parameter values can be saved and reloaded to and from disk files.

When saving command parameter values all the currently showed command parameter values along with the checkbox selections will be stored to the selected disk file.

When reloading command parameter values from a disk file all the stored command parameter values will be reloaded.

The file from which command parameter values are reloaded must contain data from a device with the same ID as the currently selected one.



The dialog box "HB Import / Export for DAD141" contains four main sections for selecting command parameters:

- Calibration Selections:**

Command	Value
<input type="checkbox"/> CI - Set Minimum	-10009
<input type="checkbox"/> CM - Set Maximum	10009
<input type="checkbox"/> DP - Decimal Position	0
<input type="checkbox"/> DS - Display Step	1
<input type="checkbox"/> TN - Tare Non volatile	0
<input type="checkbox"/> ZI - Init Zero	0
<input type="checkbox"/> ZN - Nonvolatile Zero	0
<input type="checkbox"/> ZR - Zero Range	0
<input type="checkbox"/> ZT - Zero Track	1
- Analog / Filter / Motion Selections:**

Command	Value
<input type="checkbox"/> AA - Set Analog Source	1
<input type="checkbox"/> AH - Set Analog High	10000
<input type="checkbox"/> AL - Set Analog Low	0
<input type="checkbox"/> AM - Set Analog Mode	0
<input type="checkbox"/> FL - Filter Value	3
<input type="checkbox"/> FM - Filter Mode	0
<input type="checkbox"/> NR - Nomotion Range	1
<input type="checkbox"/> NT - Nomotion Time	1000
<input type="checkbox"/> UR - Update Rate	0
- Checkweigher Selections:**

Command	Value
<input type="checkbox"/> HT - Hold Time	0
<input type="checkbox"/> MT - Measure Time	200
<input type="checkbox"/> SD - Start Delay	100
<input type="checkbox"/> TE - Trigger Edge	0
<input type="checkbox"/> TI - Tare Time	0
<input type="checkbox"/> TL - Trigger Level	300
<input type="checkbox"/> TW - Tare Window	0
- Digital IO / Setpoint Selections:**

Command	Value
<input checked="" type="checkbox"/> A0 - Sp 0 Source	1
<input checked="" type="checkbox"/> A1 - Sp 1 Source	1
<input checked="" type="checkbox"/> A2 - Sp 2 Source	1
<input checked="" type="checkbox"/> AIO - Assign Input 0	0
<input checked="" type="checkbox"/> AI1 - Assign Input 1	0
<input checked="" type="checkbox"/> H0 - Hyst. sp 0	0
<input checked="" type="checkbox"/> H1 - Hyst. sp 1	0
<input checked="" type="checkbox"/> H2 - Hyst. sp 2	0
<input checked="" type="checkbox"/> P0 - Polarity 0	1
<input checked="" type="checkbox"/> P1 - Polarity 1	1
<input checked="" type="checkbox"/> P2 - Polarity 2	1
<input checked="" type="checkbox"/> S0 - Setpoint 0	1000
<input checked="" type="checkbox"/> S1 - Setpoint 1	5000
<input checked="" type="checkbox"/> S2 - Setpoint 2	9999

At the bottom, there is a table for "Available Selectable Devices for Import / Export of Selected Commands":

Device Index	Device Name	Device Id
<input checked="" type="checkbox"/> 04 (Current)	DAD141	1410

Buttons at the bottom include: "Select All" (for each section), "Unselect All", "Write Selections", "Save Selections", "Load Device Values", "Save All Values to File", "Load Values from File", "Select All Groups", "Edit Command Value", "Reload from Device", "Get / Put Image (Old)", "Exit", and radio buttons for "Load with Selections" (selected) and "Load Values only".

By selecting the "Reload from Device" button the command parameter values for the currently monitored device by which the "Command View" dialog was selected will be reloaded into the value fields of the "Command Selection Views"

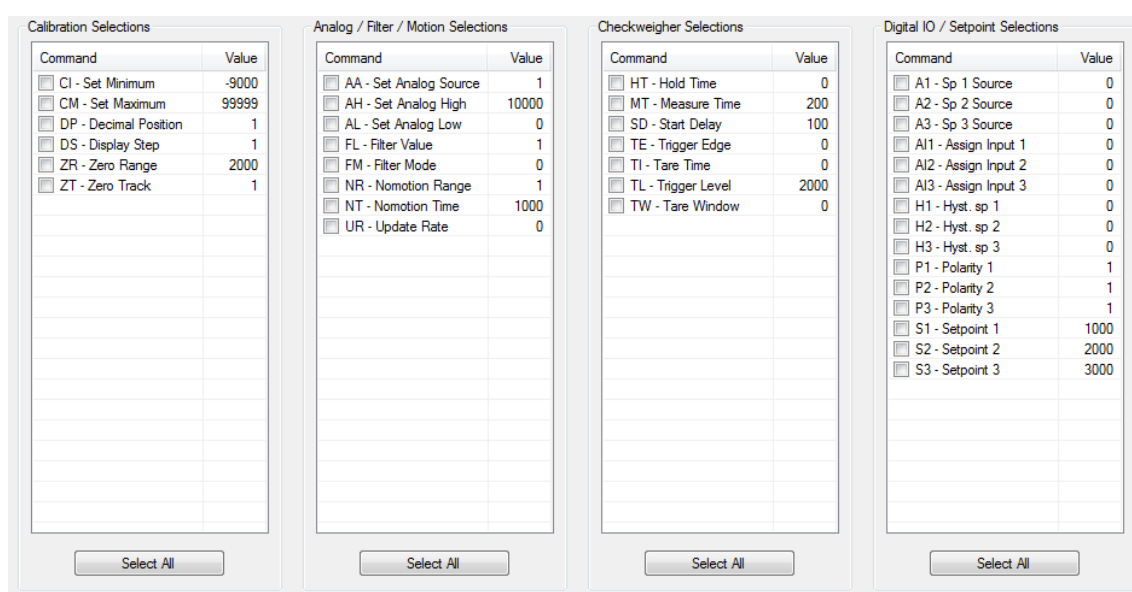
## 9.1 Command Selection Views

The "Command Selection Views" shows all the "read / write" able command parameters with their current values available for import and export.

The different command parameters to be exported to one or more devices can be selected by checking the checkbox belonging to a given command parameter. By selecting one of the "Select All" buttons, all the checkboxes belonging to the group of the "Select All" button will be checked, and the button status will be changed to "Unselect All". Selecting the button in this state will uncheck all the check boxes in the group.

The value of a given command parameter can be edited by selecting the command parameter value field and selecting the "Edit <command> Value" button.

The figure below shows the "Command Selection Views" for the DAD / DAS devices.



Command	Value
<input type="checkbox"/> CI - Set Minimum	-9000
<input type="checkbox"/> CM - Set Maximum	99999
<input type="checkbox"/> DP - Decimal Position	1
<input type="checkbox"/> DS - Display Step	1
<input type="checkbox"/> ZR - Zero Range	2000
<input type="checkbox"/> ZT - Zero Track	1

Select All

Command	Value
<input type="checkbox"/> AA - Set Analog Source	1
<input type="checkbox"/> AH - Set Analog High	10000
<input type="checkbox"/> AL - Set Analog Low	0
<input type="checkbox"/> FL - Filter Value	1
<input type="checkbox"/> FM - Filter Mode	0
<input type="checkbox"/> NR - Nomotion Range	1
<input type="checkbox"/> NT - Nomotion Time	1000
<input type="checkbox"/> UR - Update Rate	0

Select All

Command	Value
<input type="checkbox"/> HT - Hold Time	0
<input type="checkbox"/> MT - Measure Time	200
<input type="checkbox"/> SD - Start Delay	100
<input type="checkbox"/> TE - Trigger Edge	0
<input type="checkbox"/> TI - Tare Time	0
<input type="checkbox"/> TL - Trigger Level	2000
<input type="checkbox"/> TW - Tare Window	0

Select All

Command	Value
<input type="checkbox"/> A1 - Sp 1 Source	0
<input type="checkbox"/> A2 - Sp 2 Source	0
<input type="checkbox"/> A3 - Sp 3 Source	0
<input type="checkbox"/> AI1 - Assign Input 1	0
<input type="checkbox"/> AI2 - Assign Input 2	0
<input type="checkbox"/> AI3 - Assign Input 3	0
<input type="checkbox"/> H1 - Hyst. sp 1	0
<input type="checkbox"/> H2 - Hyst. sp 2	0
<input type="checkbox"/> H3 - Hyst. sp 3	0
<input type="checkbox"/> P1 - Polarity 1	1
<input type="checkbox"/> P2 - Polarity 2	1
<input type="checkbox"/> P3 - Polarity 3	1
<input type="checkbox"/> S1 - Setpoint 1	1000
<input type="checkbox"/> S2 - Setpoint 2	2000
<input type="checkbox"/> S3 - Setpoint 3	3000

Select All

The figure below shows the “Command Selection Views” for the LDU / LDM checkweigher devices.

Calibration Selections		Filter / Motion Selections		Checkweigher Selections		Setpoint Selections	
Command	Value	Command	Value	Command	Value	Command	Value
<input type="checkbox"/> CM - Set Maximum	99999	<input type="checkbox"/> FL - Filter Value	2	<input checked="" type="checkbox"/> DT - Delta Time	50	<input type="checkbox"/> A0 - Sp 0 Source	0
<input type="checkbox"/> CM1 - Set Maximum1	99999	<input type="checkbox"/> FM - Filter Mode	0	<input checked="" type="checkbox"/> HT - Hold Time	0	<input type="checkbox"/> A1 - Sp 1 Source	0
<input type="checkbox"/> CM2 - Set Maximum2	0	<input type="checkbox"/> NR - Nomotion Range	8	<input checked="" type="checkbox"/> MT - Measure Time	200	<input type="checkbox"/> H0 - Hyst. sp 0	1
<input type="checkbox"/> CM3 - Set Maximum3	0	<input type="checkbox"/> NT - Nomotion Time	300	<input checked="" type="checkbox"/> RW - ReTrig Window	1000	<input type="checkbox"/> H1 - Hyst. sp 1	1
<input type="checkbox"/> DP - Decimal Position	3	<input type="checkbox"/> UR - Update Rate	0	<input checked="" type="checkbox"/> SD - Start Delay	100	<input type="checkbox"/> S0 - Setpoint 0	10000
<input type="checkbox"/> DS - Display Step	1			<input checked="" type="checkbox"/> TE - Trigger Edge	0	<input type="checkbox"/> S1 - Setpoint 1	20000
<input type="checkbox"/> MR - Multi Range	0			<input checked="" type="checkbox"/> TI - Tare Time	0		
<input type="checkbox"/> OF - Output Format	0			<input checked="" type="checkbox"/> TL - Trigger Level	1000		
<input type="checkbox"/> TM - Tare mode	1			<input checked="" type="checkbox"/> TS - ReTrig Stop	65280		
<input type="checkbox"/> TN - Tare Non volatile.	0			<input checked="" type="checkbox"/> TT - ReTrigger Time	100		
<input type="checkbox"/> ZI - Init Zero	30			<input checked="" type="checkbox"/> TW - Tare Window	0		
<input type="checkbox"/> ZR - Zero Range	0						
<input type="checkbox"/> ZT - Zero Track	0						

Select All      Select All      Unselect All      Select All

The figure below shows the “Command Selection Views” for the LDU / LDM filling devices.

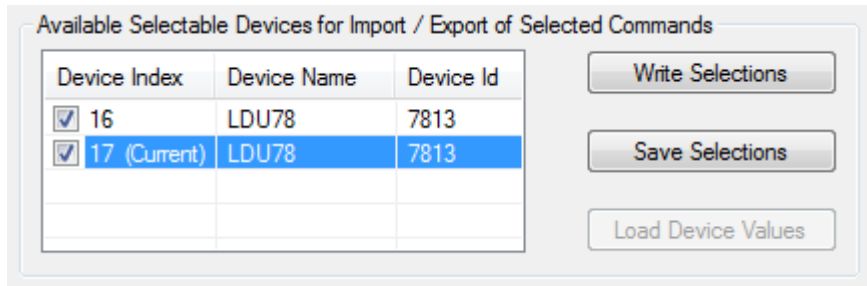
Calibration Selections		Filter / Motion Selections		Filling Selections	
Command	Value	Command	Value	Command	Value
<input type="checkbox"/> CM - Set Maximum	99999	<input type="checkbox"/> FL - Filter Value	3	<input type="checkbox"/> PD01 - Pre-fill mode	2
<input type="checkbox"/> DP - Decimal Position	0	<input type="checkbox"/> FM - Filter Mode	0	<input type="checkbox"/> PD02 - In-flight correction	0
<input type="checkbox"/> DS - Display Step	1	<input type="checkbox"/> NR - Nomotion Range	1	<input type="checkbox"/> PD03 - Zero check time	0
<input type="checkbox"/> ZT - Zero Track	0	<input type="checkbox"/> NT - Nomotion Time	1000	<input type="checkbox"/> PD04 - Tare delay	50
		<input type="checkbox"/> UR - Update Rate	0	<input type="checkbox"/> PD05 - Tare average time	500
				<input type="checkbox"/> PD06 - Delay after pre-fill	50
				<input type="checkbox"/> PD07 - Blanking time	50
				<input type="checkbox"/> PD08 - In-flight delay time	1000
				<input type="checkbox"/> PD09 - Fill weight average time	500
				<input type="checkbox"/> PD10 - Zero tolerance	20
				<input type="checkbox"/> PD11 - Tare reference	21
				<input type="checkbox"/> PD12 - Tare tolerance	10
				<input type="checkbox"/> PD13 - Pre-fill level	20
				<input type="checkbox"/> PD14 - Fine-fill weight	21
				<input type="checkbox"/> PD15 - Filling weight	1830
				<input type="checkbox"/> PD16 - In-flight value	0

Select All      Select All      Select All

## 9.2 Selecting Devices for Import / Export

From the "Available Selectable Devices...." group the devices to which command parameter values should be exported are selected. Device selection is done by checking the belonging check box.

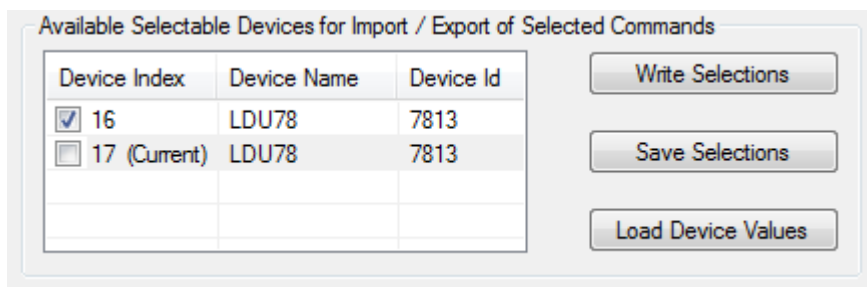
Selectable devices can be up to 4 devices each assigned to one of the 4 available device channels. The devices must have the same ID as the currently selected device for appearing in the selectable device list.



Device Index	Device Name	Device Id
<input checked="" type="checkbox"/> 16	LDU78	7813
<input checked="" type="checkbox"/> 17 (Current)	LDU78	7813

Buttons: Write Selections, Save Selections, Load Device Values (disabled)

If only one of the selectable devices is checked, the "Load Device Values" button will be enabled and the command parameter values from this selected device can be imported to the "Command Selection Views".



Device Index	Device Name	Device Id
<input checked="" type="checkbox"/> 16	LDU78	7813
<input type="checkbox"/> 17 (Current)	LDU78	7813

Buttons: Write Selections, Save Selections, Load Device Values (disabled)

### 9.2.1 Write Selections

By selecting the "Write Selections" button, all the selected command parameter values are written to the selected devices 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 device.

If a command parameter doesn't exist for the current device (Old Version) or the parameter value for some reason couldn't be written to the device, the command parameter will be marked with a red color.

### 9.2.2 Save Selections

If the selected command parameter values are to be used after device power down/up, it's necessary to save the settings into the EEPROM of the device. By selecting the "Save Selections" button, the selected command parameter values are saved into the EEPROM of the selected devices.

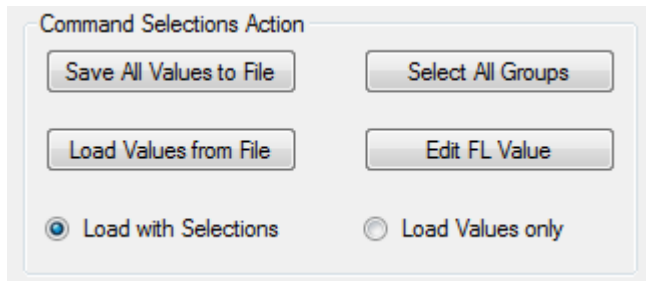
If selections from the "Calibration Selections" group are to be saved to the device, a warning about the TAC counter will be increased will be showed.

### 9.2.3 Load Device Values

By selecting the "Load Device Values" button, all of the available command parameter values will be read from the selected device into the available "Command Selection Views" fields. If the selected device is the same as the currently selected device, the actions will be the same as if the "Reload from Device" button was selected.

### 9.3 Command Selection Action

From the "Command Selections Action" group, functions for taking action of the command parameter values from the "Command Selection Views" can be accessed.



#### 9.3.1 Save All Values to File

By selecting the "Save All Values to File" button, all the command parameter values from the value fields of the "Command Selection Views" are written to a selected disk file of own choice. If any command parameter selections in the "Command Selection Views" are checked, these checked selections will be stored too.

#### 9.3.2 Load Values from File

By selecting the "Load Values from File" button, previously stored command parameter values will be reloaded from the selected disk file into the value fields of the "Command Selection Views". If the radio button "Load with Selectors" is selected, the checked checkboxes stored with the selected disk file will be checked too, otherwise only the command parameter valued will be loaded.

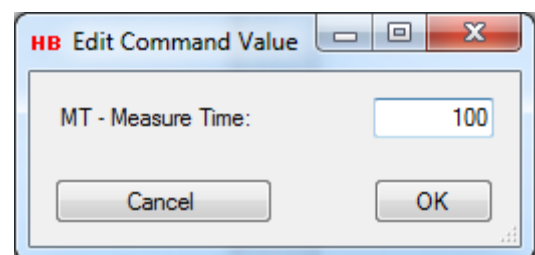
The device ID for which the command parameter values was stored must be the same as the currently monitored device.

#### 9.3.3 Select All Groups

By selecting the "Select All Groups" button, all the available command parameter check boxes in the "Command Selection Views" will be checked and the status of the button will change to "Unselect All Groups". Selecting the button in this state will uncheck all the check boxes in the "Command Selection Views".

#### 9.3.4 Edit <command> Value

By selecting the "Edit <command> Value" button, a dialog will pop up by which the selected command parameter can be modified. The button will only be enabled if a command parameter from the "Command Selection Views" is selected. By clicking on one of the values of the command parameters, the command parameter will be selected and the "Edit <command> Value" button will reflect the ID of the selected command parameter.

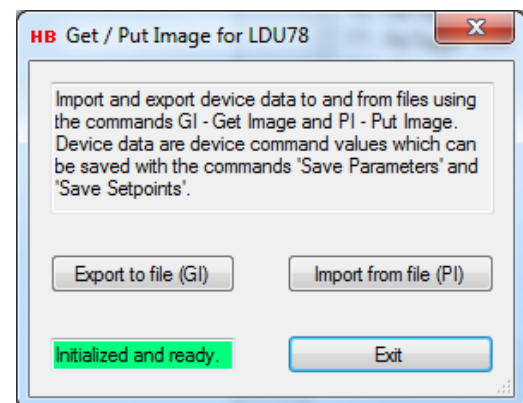


## 9.4 Get / Put Image

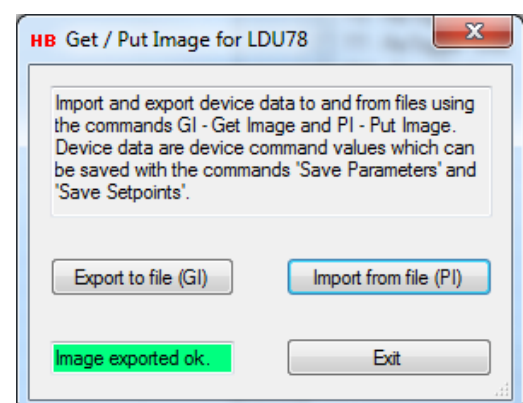
From the dialog "Get / Put Image" it's possible to export and import the command parameters which can be saved with the commands "Save Parameters" (WP) and "Save Setpoints" (SS). Getting and putting command values is only possible for serial COM port communication-based devices, so it's recommended that the user uses the "Save all Values to File" and "Load Values from File" buttons when exporting and importing data from and to a device. This also gives more control over the content of the parameters.

When entering the "Get / Put Image" dialog, the device will be checked for support of Get / Put image functionality. (The GI and PI commands)

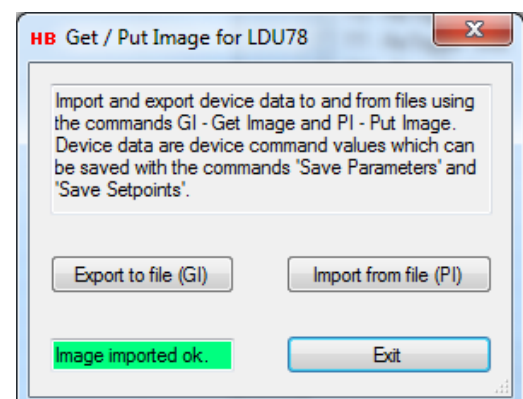
If the status field is green, the device is ready for import or export of device parameters data.



By selecting the "Export to file (GI)" button, the device parameters data will be written to a file of user choice. The file must have the extension .did (Device Image Data).



By selecting the "Import from file (PI)" button, the device parameters data will be read from a ".did" file of users selection.



The device, to which the parameters are imported, must have the same device ID and version as the original exported parameters data. If this is not the case, a warning message indicating this will be displayed. The imported data will in this case not be written to the device.

## 10 Input / Output

The "Input / Output" dialog is used for examining and modifying the settings covering functionality concerning the output and input connections for a given H&B device.

The "Input / Output" dialog is designed in two different versions. The version presented for the user depends on the currently monitored device. The different versions will be described in separate sections as there are too many differences between the three dialogs to explain them as one.

The "Input / Output" dialog can be accessed from the "Commands View" dialog.

The "Input / Output" dialog can also be accessed from popup menus in the main window.

### 10.1 The LDU / LDM Dialog

The "Input / Output" dialog for the LDU / LDM device consist of:

- An "Input Values" group where the values of the physical input pin connections can be examined.
- An "Output Values" and "Output Masks" group where the values of the physical output pin connections can be examined and modified.
- A "Setpoints Group" where all the command parameter values belonging to the setpoints group for the LDM / LDU device can be examined and modified.



**HB Input / Output for LDM88**

**Input Values**

Input 0: 0  
Input 1: 0  
Input 2: 0  
Input 3: 0

**Weight Status**

Net: -0.007  
Gross: -0.005  
Signal Stable: ■

**Output Values**

Output 0: 0  
Output 1: 0  
Output 2: 0  
Output 3: 0

**Output Masks**

Output 0: 0  
Output 1: 0  
Output 2: 0  
Output 3: 0

**Setpoints Group**

**Setpoint**

S0: 1000  
S1: 2000  
S2: 3000  
S3: 4000

**Hysteresis**

H0: 1  
H1: 1  
H2: 1  
H3: 1

**Source**

A0: 1: Net  
A1: 0: Gross  
A2: 0: Gross  
A3: 0: Gross

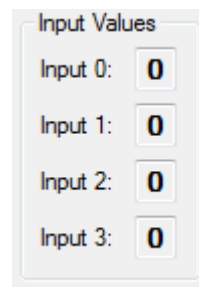
HT - Setpoints Hold Time (ms): 0

Click on the value of a field in the Output Values and Output Masks groups to toggle the value of the field.

Buttons: Help on S3, Filter / Tare, Exit, Write All, Save All

### 10.1.1 Monitoring Input Values

From the "Input Values" the values of the different physical input pins can be examined. The value will reflect the status of the pins and change every time the status of the input pins changes.



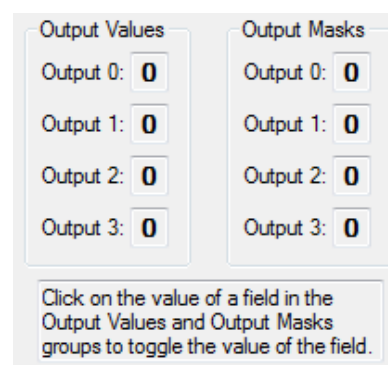
Input Values	
Input 0:	0
Input 1:	0
Input 2:	0
Input 3:	0

### 10.1.2 Monitoring / Setting Output Values

From the "Output Values" group the values of the different physical output pins can be examined. The value will reflect the status of the pins and change every time the status of the output pins changes.

The output pin values can be changed manually by setting the corresponding output field in the "Output Masks" group to "1", before changing the value of a given output pin in the "Output Values" group.

The output values in the two groups can be set on and off by clicking with the mouse on the output value fields to be changed.



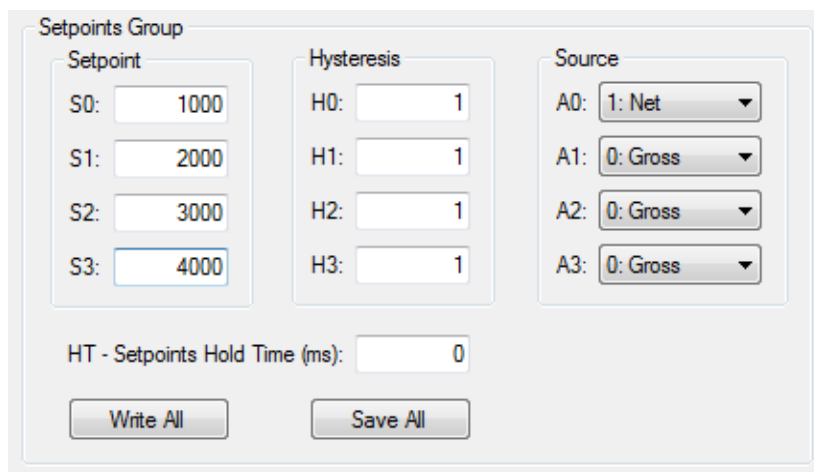
Output Values		Output Masks	
Output 0:	0	Output 0:	0
Output 1:	0	Output 1:	0
Output 2:	0	Output 2:	0
Output 3:	0	Output 3:	0

Click on the value of a field in the Output Values and Output Masks groups to toggle the value of the field.

### 10.1.3 Setpoints Group

In the Setpoints" group the command parameter values for each of the available setpoint group items "Setpoint", "Source", "Hysteresis" and "Hold Time" of the currently monitored LDU / LDM device can be examined and modified.

The individual setpoint command parameter values are aligned with the "Output Values" groups for easy verification of the action of a given input or output value read from the input and output pins.



Setpoints Group			
Setpoint		Hysteresis	
S0:	1000	H0:	1
S1:	2000	H1:	1
S2:	3000	H2:	1
S3:	4000	H3:	1
		Source	
		A0:	1: Net
		A1:	0: Gross
		A2:	0: Gross
		A3:	0: Gross
HT - Setpoints Hold Time (ms): 0			
Write All		Save All	

A given setpoint group item command parameter value can be modified by selecting the actual command parameter to be changed and modify the current value.

#### **10.1.3.1 Write Settings**

By selecting the "Write All" button, the changed command parameter 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 device.

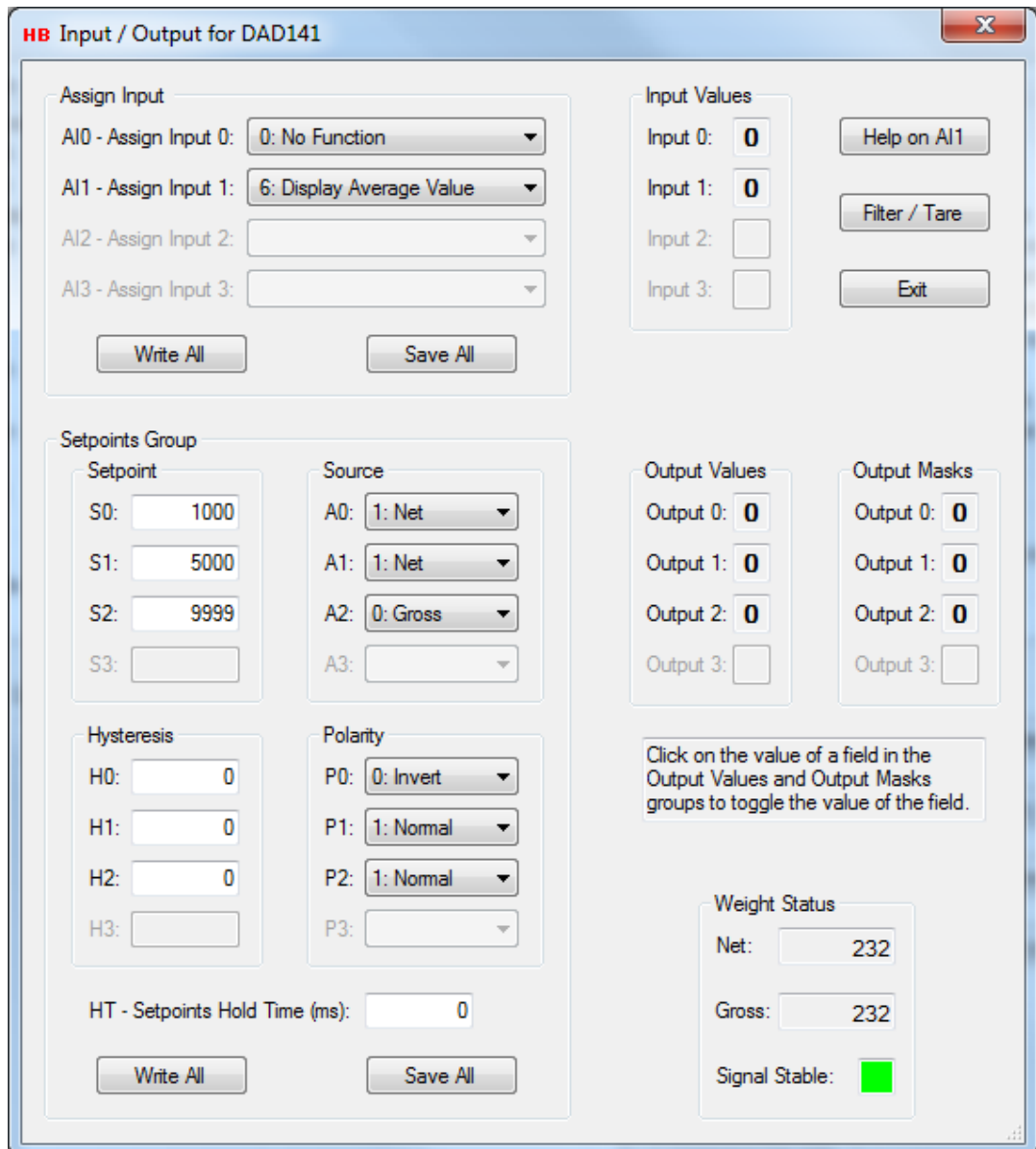
#### **10.1.3.2 Save Settings**

If the changed setpoint group items command parameter values are to be used after device power down/up, it's necessary to save the settings into the EEPROM of the device. By selecting the "Save All" button, the changed setpoint group items command parameter values are saved into the EEPROM of the device.

## 10.2 The DAD / DAS Dialog

The "Input / Output" dialog for the DAD / DAS device consist of:

- An "Assign Input" group where the functionality of the input connections can be examined and modified.
- An "Input Values" group where the values of the physical input pin connections can be examined.
- An "Output Values" and "Output Masks" group where the values of the physical output pin connections can be examined and modified.
- A "Setpoints Group" where all the command parameter values belonging to the setpoints group for the DAD / DAS device can be examined and modified.



**HB Input / Output for DAD141**

**Assign Input**

AI0 - Assign Input 0: 0: No Function

AI1 - Assign Input 1: 6: Display Average Value

AI2 - Assign Input 2:

AI3 - Assign Input 3:

Write All Save All

**Input Values**

Input 0: 0 Help on AI1

Input 1: 0 Filter / Tare

Input 2:

Input 3: Exit

**Setpoints Group**

**Setpoint**

S0: 1000

S1: 5000

S2: 9999

S3:

**Source**

A0: 1: Net

A1: 1: Net

A2: 0: Gross

A3:

**Hysteresis**

H0: 0

H1: 0

H2: 0

H3:

**Polarity**

P0: 0: Invert

P1: 1: Normal

P2: 1: Normal

P3:

HT - Setpoints Hold Time (ms): 0

Write All Save All

**Output Values**

Output 0: 0

Output 1: 0

Output 2: 0

Output 3:

**Output Masks**

Output 0: 0

Output 1: 0

Output 2: 0

Output 3:

Click on the value of a field in the Output Values and Output Masks groups to toggle the value of the field.

**Weight Status**

Net: 232

Gross: 232

Signal Stable: ■

As the DAD and the DAS device share the same dialog layout the fields not covering the specific device will be disabled. The figure above shows the layout with a DAD device connected.

**HB Input / Output for DAS72**

**Assign Input**

AI0 - Assign Input 0:

AI1 - Assign Input 1:

AI2 - Assign Input 2:

AI3 - Assign Input 3:

**Input Values**

Input 0:

Input 1:

Input 2:

Input 3:

**Setpoints Group**

**Setpoint**

S0:

S1:

S2:

S3:

**Source**

A0:

A1:

A2:

A3:

**Hysteresis**

H0:

H1:

H2:

H3:

**Polarity**

P0:

P1:

P2:

P3:

HT - Setpoints Hold Time (ms):

**Output Values**

Output 0:

Output 1:

Output 2:

Output 3:

**Output Masks**

Output 0:

Output 1:

Output 2:

Output 3:

Click on the value of a field in the Output Values and Output Masks groups to toggle the value of the field.

**Weight Status**

Net:

Gross:

Signal Stable: ☒

As the DAD and the DAS device share the same dialog layout the fields not covering the specific device will be disabled. The figure above shows the layout with a DAS device connected.

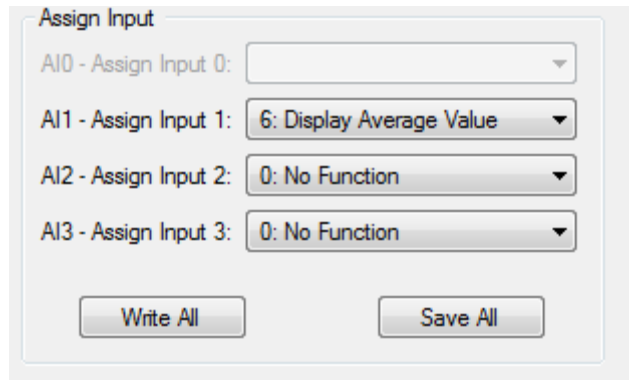
The figures used as illustrations in the following sections covering the DAD / DAS devices will be illustrations taken from a DAS device, but they cover the DAD device too.

### 10.2.1 Assign Input

In the "Assign Input" group the functionality settings for each of the available input connections of the currently connected DAD or DAS device can be examined and modified.

The individual input combo boxes are aligned with the "Input Values" group for easy verification of the action of a given input value.

A given "Assign Input" value can be modified by selecting the actual combo box for the functionality to be changed and selecting the new functionality from the drop-down list.



The "Assign Input" window contains four dropdown menus for AI0 through AI3. AI0 is empty, AI1 is set to "6: Display Average Value", and AI2 and AI3 are set to "0: No Function". At the bottom are "Write All" and "Save All" buttons.

#### 10.2.1.1 Write Settings

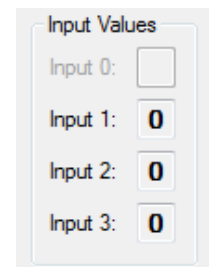
By selecting the "Write All" button, the changed "Assign Input" values are written for further use, but not saved. If the values are only written, but not saved, the value of the settings is lost when power is removed from the device.

#### 10.2.1.2 Save settings

If the changed "Assign Input" settings are to be used after device power down/up, it's necessary to save the settings into the EEPROM of the device. By selecting the "Save All" button, the changed "Assign Input" values are saved into the EEPROM of the device.

### 10.2.2 Monitoring Input Values

From the "Input Values" the values of the different physical input pins can be examined. The value will reflect the status of the pins and change every time the status of the input pins changes.



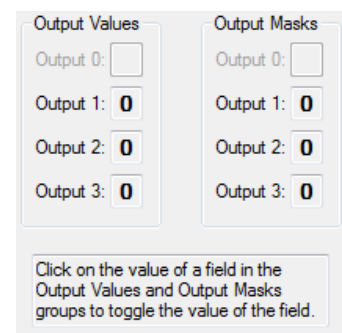
The "Input Values" window shows four input pins. Input 0 is an empty checkbox, while Inputs 1, 2, and 3 are each followed by a box containing the value "0".

### 10.2.3 Monitoring / Setting Output Values

From the "Output Values" group the values of the different physical output pins can be examined. The value will reflect the status of the pins and change every time the status of the output pins changes.

The output pin values can be changed manually by setting the corresponding output field in the "Output Masks" group to "1", before changing the value of a given output pin in the "Output Values" group.

The output values in the two groups can be set on and off by clicking with the mouse on the output value fields to be changed.



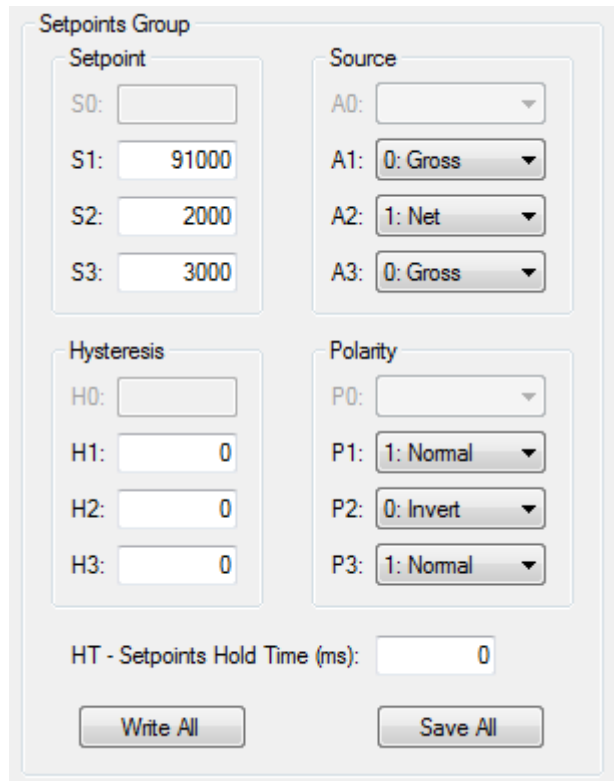
Two side-by-side windows are shown. "Output Values" has four boxes with values 0, 0, 0, and 0. "Output Masks" has four boxes with values 0, 0, 0, and 0. A note at the bottom states: "Click on the value of a field in the Output Values and Output Masks groups to toggle the value of the field."

### 10.2.4 Setpoints Group

In the Setpoints" group the command parameter values for each of the available setpoint group items "Setpoint", "Source", "Hysteresis", "Polarity" and "Hold Time" of the currently monitored DAD / DAS device can be examined and modified.

The individual setpoint command parameter values are aligned with the "Output Values" groups for easy verification of the action of a given input or output value read from the input and output pins.

A given setpoint group item command parameter value can be modified by selecting the actual command parameter to be changed and modify the current value.



**Setpoints Group**

Setpoint	Source
S0: <input type="text"/>	A0: <input type="text"/>
S1: <input type="text" value="91000"/>	A1: <input type="text" value="0: Gross"/>
S2: <input type="text" value="2000"/>	A2: <input type="text" value="1: Net"/>
S3: <input type="text" value="3000"/>	A3: <input type="text" value="0: Gross"/>

Hysteresis	Polarity
H0: <input type="text"/>	P0: <input type="text"/>
H1: <input type="text" value="0"/>	P1: <input type="text" value="1: Normal"/>
H2: <input type="text" value="0"/>	P2: <input type="text" value="0: Invert"/>
H3: <input type="text" value="0"/>	P3: <input type="text" value="1: Normal"/>

HT - Setpoints Hold Time (ms):

#### 10.2.4.1 Write Settings

By selecting the "Write All" button, the changed command parameter 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 device.

#### 10.2.4.2 Save settings

If the changed setpoint group items command parameter values are to be used after device power down/up, it's necessary to save the settings into the EEPROM of the device. By selecting the "Save All" button, the changed setpoint group items command parameter values are saved into the EEPROM of the device.

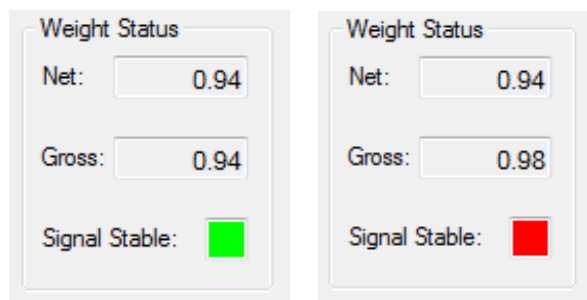
## 10.3 Common for all Input / Output dialogs

Selecting the "Filter / Tare" button will open the general "Filter / Tare" Dialog if needed.

### 10.3.1 Weight Status

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

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.



**Weight Status**

Net: <input type="text" value="0.94"/>	Net: <input type="text" value="0.94"/>
Gross: <input type="text" value="0.94"/>	Gross: <input type="text" value="0.98"/>
Signal Stable: <input checked="" type="checkbox"/>	Signal Stable: <input type="checkbox"/>

## 11 Checkweigher Dialog

The "Checkweigher" dialog can be accessed from the "Commands View" dialog if the firmware type of the device is "Checkweigher".

The "Checkweigher" dialog can also be accessed from the "Average Measurement" dialog.

### 11.1 Inspecting and changing parameters

In the "Checkweigher" dialog all of the parameters from the "Checkweigher" commands group can be inspected and changed. Simply select a parameter text field and change the value. The content of the "Checkweigher" dialog can vary a bit depending on the currently selected device. The checkweigher command parameters showed in the figure is for the LDU78 device.

#### 11.1.1 Write Settings

By selecting the "Write All" button, the changed checkweigher parameter 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 device.

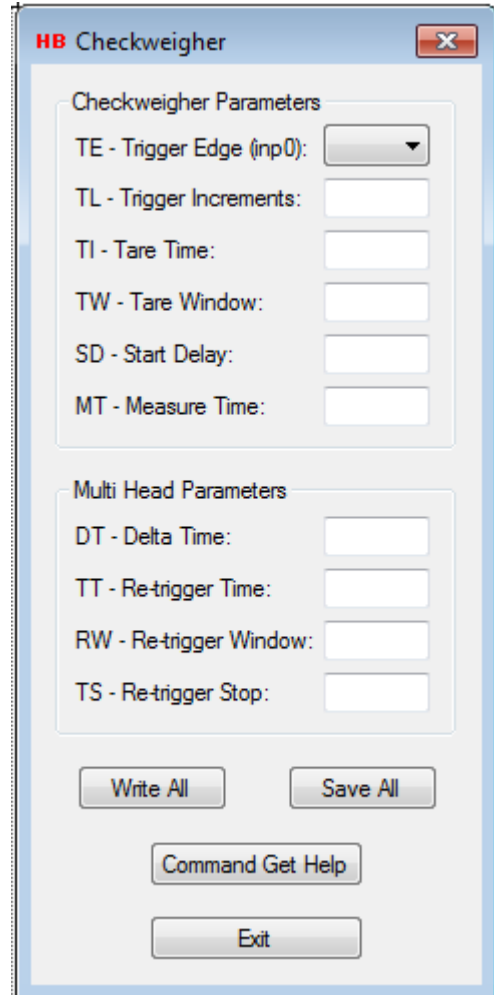
#### 11.1.2 Save settings

If the changed checkweigher parameter values are to be used after device power down / up, it's necessary to save the settings into the EEPROM of the device.

By selecting the "Save All" button, the changed checkweigher parameter values are saved into the EEPROM of the device.

#### 11.1.3 Help on (Command)

If the user is connected to the internet, selecting the help button "Help on (Command)" will give access to the help page for the currently highlighted command button or command text field.

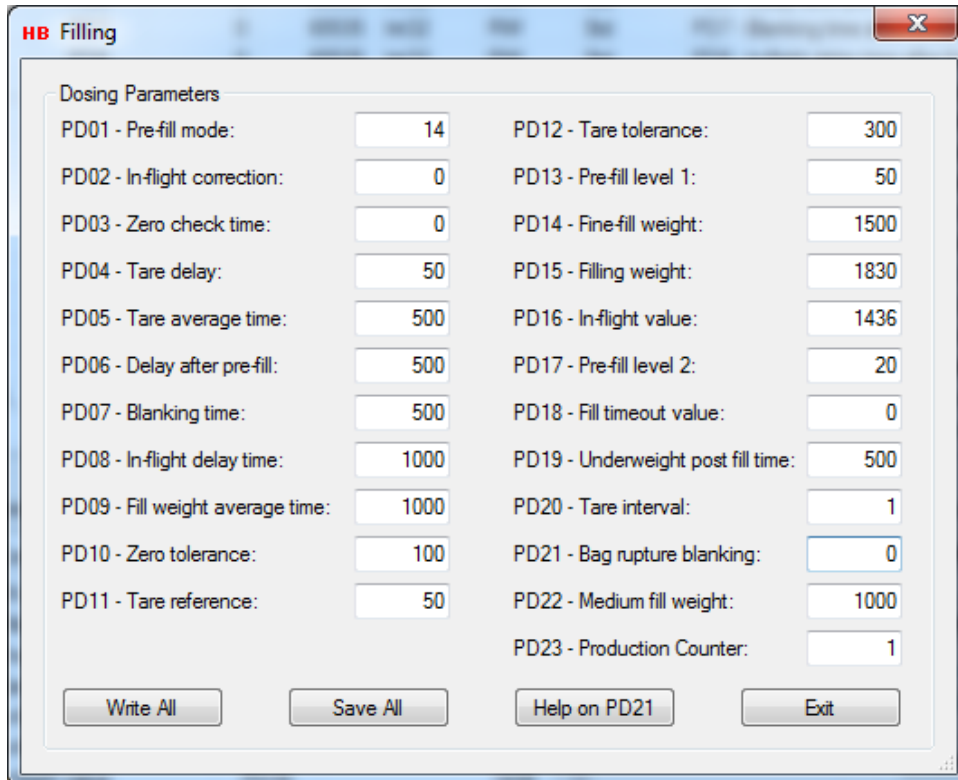


## 12 Filling Dialog

The "Filling" dialog can be accessed from the "Commands View" dialog if the firmware type of the device is "Filling".

### 12.1 Inspecting and changing parameters

In the "Filling" dialog all of the parameters from the "Filling" commands group can be inspected and changed. Simply select a parameter text field and change the value. The content of the "Filling" dialog can vary a bit depending on the currently selected device. The filling command parameters showed in the figure is for the DAD141 device.



The screenshot shows a window titled "HB Filling" with a close button (X) in the top right corner. The window contains a list of dosing parameters for a DAD141 device, arranged in two columns. Each parameter is followed by a text input field containing a numerical value. At the bottom of the window, there are four buttons: "Write All", "Save All", "Help on PD21", and "Exit".

Dosing Parameters	
PD01 - Pre-fill mode:	14
PD02 - In-flight correction:	0
PD03 - Zero check time:	0
PD04 - Tare delay:	50
PD05 - Tare average time:	500
PD06 - Delay after pre-fill:	500
PD07 - Blanking time:	500
PD08 - In-flight delay time:	1000
PD09 - Fill weight average time:	1000
PD10 - Zero tolerance:	100
PD11 - Tare reference:	50
PD12 - Tare tolerance:	300
PD13 - Pre-fill level 1:	50
PD14 - Fine-fill weight:	1500
PD15 - Filling weight:	1830
PD16 - In-flight value:	1436
PD17 - Pre-fill level 2:	20
PD18 - Fill timeout value:	0
PD19 - Underweight post fill time:	500
PD20 - Tare interval:	1
PD21 - Bag rupture blanking:	0
PD22 - Medium fill weight:	1000
PD23 - Production Counter:	1

Buttons at the bottom: Write All, Save All, Help on PD21, Exit

#### 12.1.1 Write Settings

By selecting the "Write All" button, the changed filling parameter 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 device.

#### 12.1.2 Save settings

If the changed filling parameter values are to be used after device power down / up, it's necessary to save the settings into the EEPROM of the device.

By selecting the "Save All" button, the changed filling parameter values are saved into the EEPROM of the device.

#### 12.1.3 Help on (Command)

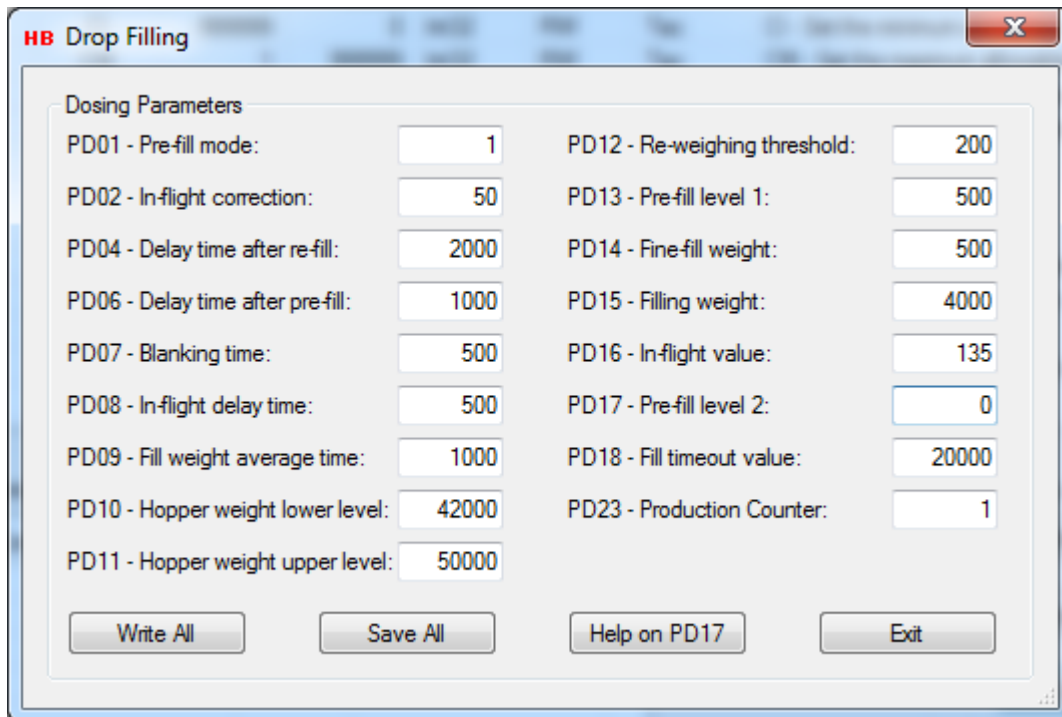
If the user is connected to the internet, selecting the help button "Help on (Command)" will give access to the help page for the currently highlighted command button or command text field.

## 13 Drop Filling Dialog

The "Drop Filling" dialog can be accessed from the "Commands View" dialog if the firmware type of the device is "Drop Filling".

### 13.1 Inspecting and changing parameters

In the "Drop Filling" dialog all of the parameters from the "Drop Filling" commands group can be inspected and changed. Simply select a parameter text field and change the value. The filling command parameters showed in the figure is for the DAD141 / DAD142 device.



Dosing Parameters	
PD01 - Pre-fill mode:	1
PD02 - In-flight correction:	50
PD04 - Delay time after re-fill:	2000
PD06 - Delay time after pre-fill:	1000
PD07 - Blanking time:	500
PD08 - In-flight delay time:	500
PD09 - Fill weight average time:	1000
PD10 - Hopper weight lower level:	42000
PD11 - Hopper weight upper level:	50000
PD12 - Re-weighing threshold:	200
PD13 - Pre-fill level 1:	500
PD14 - Fine-fill weight:	500
PD15 - Filling weight:	4000
PD16 - In-flight value:	135
PD17 - Pre-fill level 2:	0
PD18 - Fill timeout value:	20000
PD23 - Production Counter:	1

Buttons: Write All, Save All, Help on PD17, Exit

#### 13.1.1 Write Settings

By selecting the "Write All" button, the changed drop filling parameter 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 device.

#### 13.1.2 Save settings

If the changed drop filling parameter values are to be used after device power down / up, it's necessary to save the settings into the EEPROM of the device.

By selecting the "Save All" button, the changed drop filling parameter values are saved into the EEPROM of the device.

#### 13.1.3 Help on (Command)

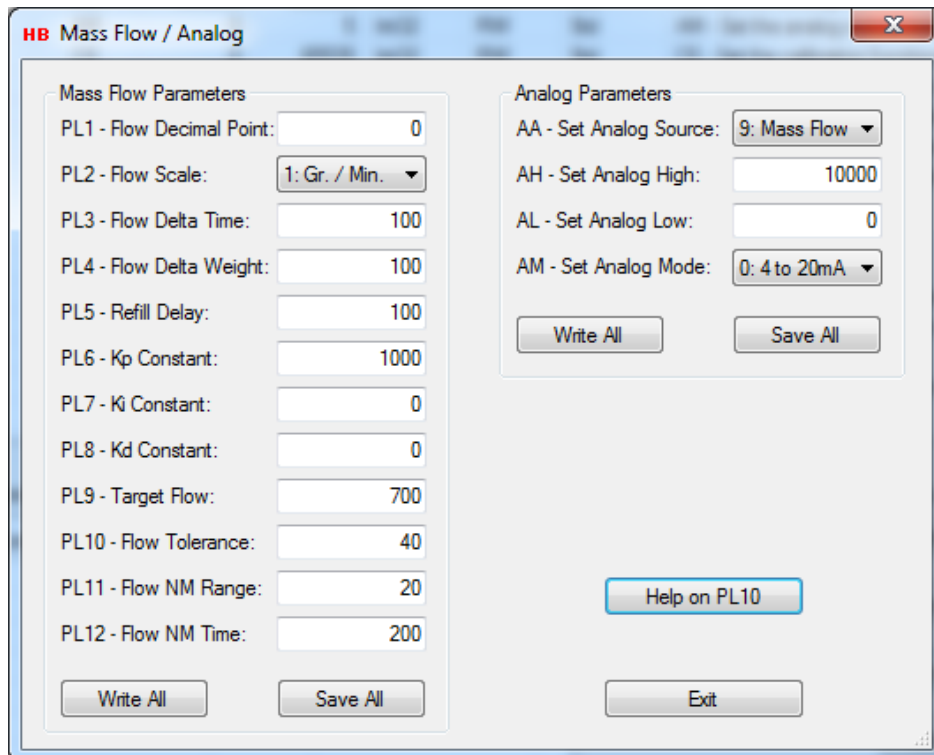
If the user is connected to the internet, selecting the help button "Help on (Command)" will give access to the help page for the currently highlighted command button or command text field.

## 14 Mass Flow / Analog Dialog

The "Mass Flow / Analog" dialog can be accessed from the "Commands View" dialog if the firmware type of the device is "Mass Flow".

### 14.1 Inspecting and changing parameters

In the "Mass Flow / Analog" dialog all the parameters from the "Mass Flow" and "Analog" commands groups can be inspected and changed. Simply select a parameter text field and change the value. The "Mass Flow / Analog" dialog can look a bit different from the figure below depending on device and version.



#### 14.1.1 Write Settings

By selecting the "Write All" button in one of the commands groups, the changed parameter values for the group belonging to the "Write All" button 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 device.

#### 14.1.2 Save settings

If the changed "Mass Flow" or Analog" parameter values are to be used after device power down / up, it's necessary to save the settings into the EEPROM of the device.

By selecting the "Save All" button in one of the commands groups, the changed parameter values for the group belonging to the "Save All" button are saved into the EEPROM of the device.

#### 14.1.3 Help on (Command)

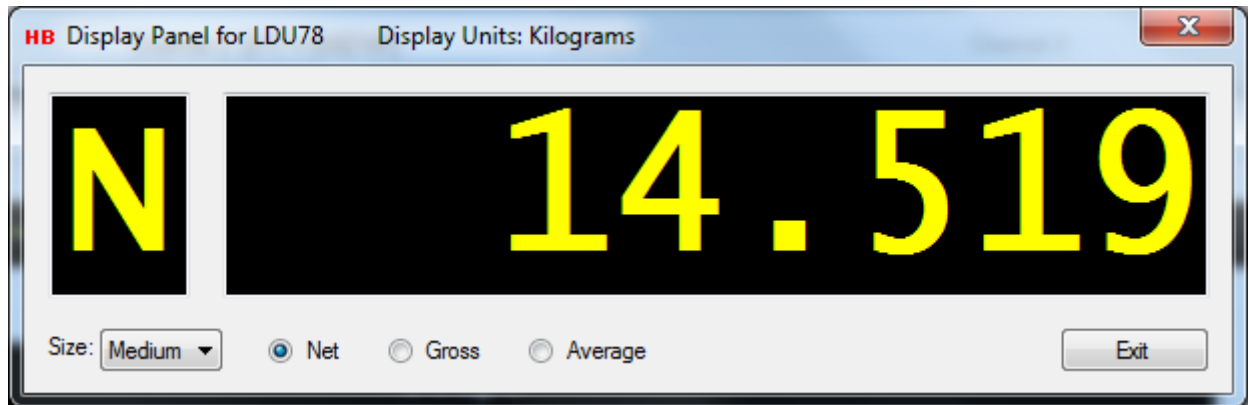
If the user is connected to the internet, selecting the help button "Help on (Command)" will give access to the help page for the currently highlighted command button or command text field.

## 15 Display Panel

The "Display Panel" dialog is a dialog for showing a large display to be viewed from a distance. The display reflects the Net, Gross or Average value for the selected device by choice. The size of the display can be adjusted.

The "Display Panel" dialog can be accessed from the "Commands View" dialog.  
The "Display Panel" dialog can also be accessed from popup menus in the main window.

If the field of the "Big Display Units" is defined in the "General Configuration" dialog, the display units text will be shown in the header of the "Display Panel" dialog.



### 15.1.1 Size

The default size of the display can be changed by selecting one of the predefined size values from the "Size:" drop down box.

### 15.1.2 Net

By checking the radio button "Net", the weight values presented on the display will be the Net values sent from the selected device. This is indicated by the letter 'N' on the Left side of the dialog.

### 15.1.3 Gross

By checking the radio button "Gross", the weight values presented on the display will be the Gross values sent from the selected device. This is indicated by the letter 'G' on the Left side of the dialog.

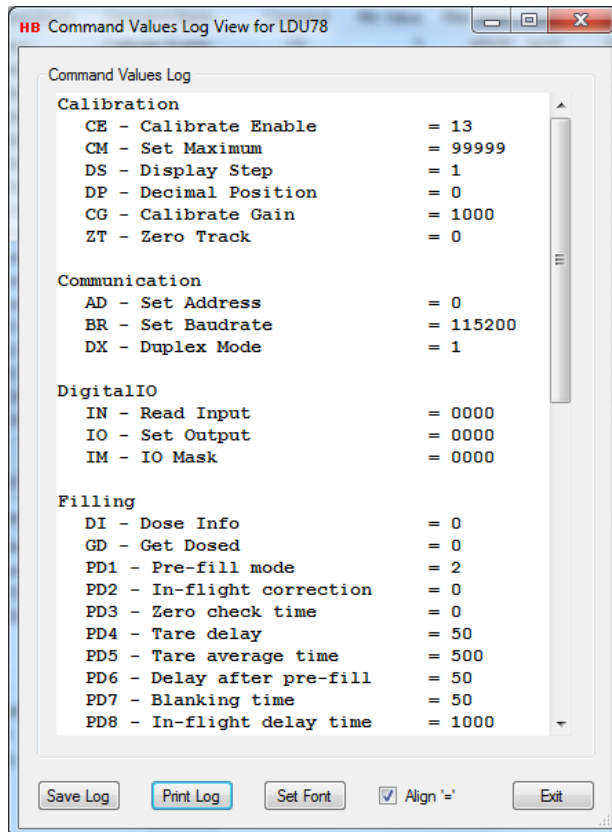
### 15.1.4 Average

If the selected device supports average measurement, the radio button "Average" will be enabled. By checking the radio button "Average", the weight values presented on the display will be the Average values sent from the selected device. This is indicated by the letter 'A' on the Left side of the dialog.

## 16 Values Log View

The "Values Log View" dialog is a dialog tool for saving and printing the values of all the valid command parameters for the currently selected device.

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



### 16.1.1 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.

### 16.1.2 Print Log

Selecting the "Print Log" button, the content of the "Command Values Log" text field can be send to a connected printer by selection.

### 16.1.3 Set Font

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

### 16.1.4 Align `='

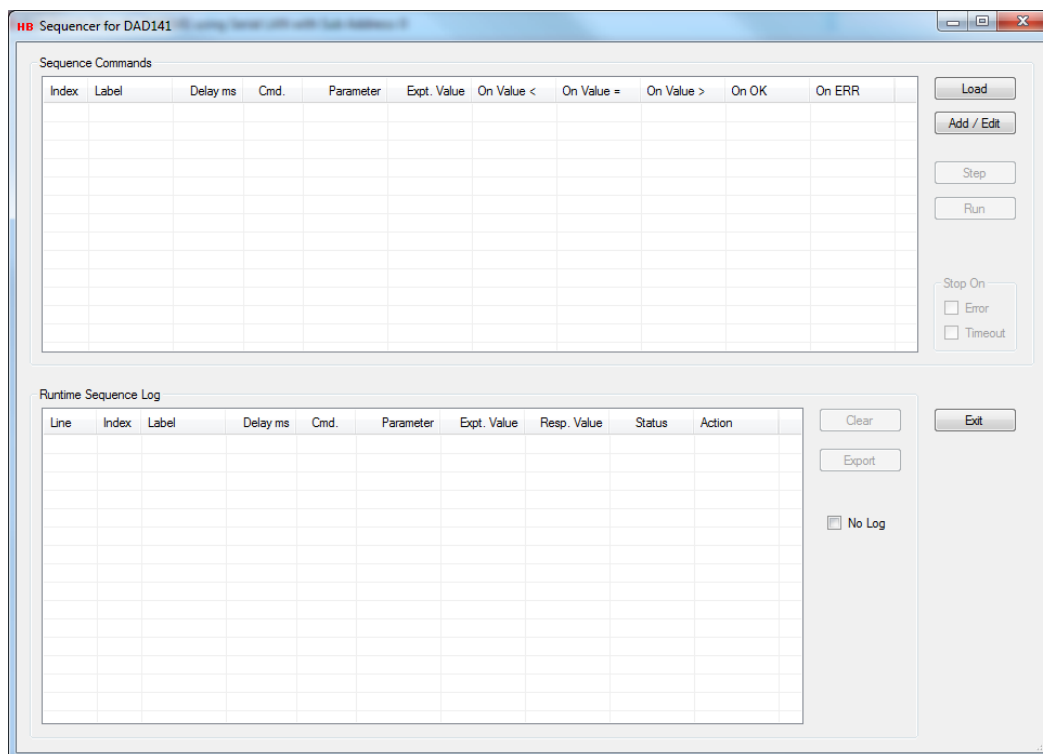
By checking the "Align `='" field the content of the "Command Values Log" text field can be adjusted so all of the `=' signs are aligned together.

## 17 Sequencer Dialog

The "Sequencer" dialog is a dialog for sending several predefined device commands to the current device with a controlled delay between the defined commands.

The execution of the commands will be performed one by one in the defined order but certain conditions can be set up so the execution will jump to and continue from a defined line label if specific condition appears during the command execution.

The figure below shows the entrance dialog of the "Sequencer".

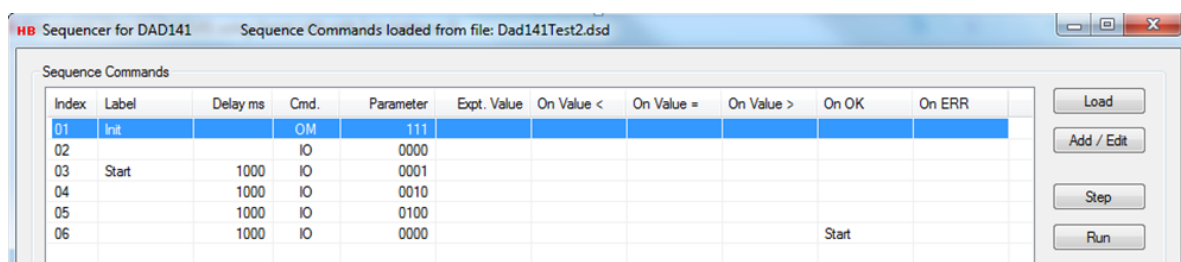


### 17.1 Load Command Sequence

A predefined sequence set of device commands can be loaded from a disk file by selecting the "Load" button. The loaded commands can be inspected in the "Sequence Commands" view.

The figure below shows a loaded sequence of device commands where when executed the 3 outputs of the connected DAD141 will be set one by one with a delay of one second. When the last line is reached and the response result for the last command is OK, the execution will jump to the line with the "Start" label and continue from this line. So, in this case the execution is looping. If the condition for jumping to the "Start" label is not met, the execution will stop at the last line of the sequence commands.

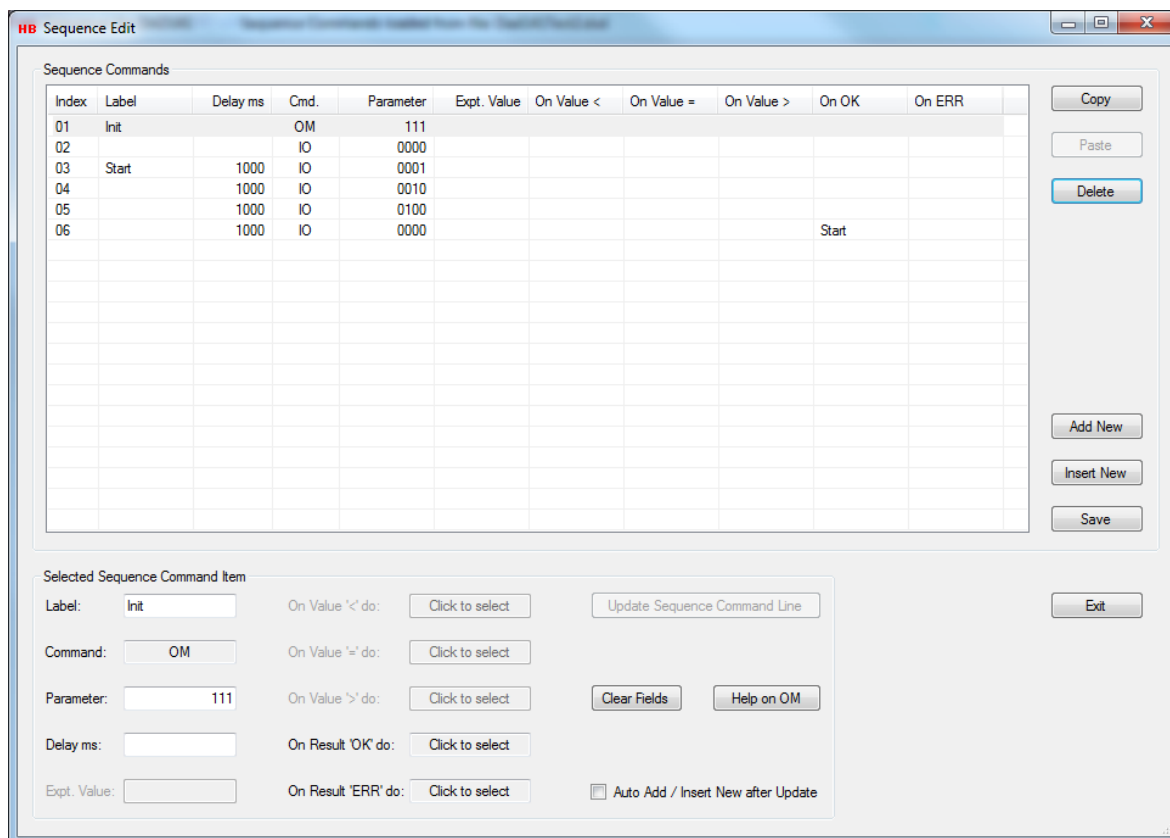
If a condition for jumping to the "Start" label was not defined, the execution will stop at the last line of the sequence.



## 17.2 Add / Edit Command Sequence

By selecting the "Add / Edit" button the "Sequence Edit" dialog will be opened and the current device command sequence can be edited, and commands can be moved around, deleted or new commands can be added or inserted.

The figure below shows the "Sequence Edit" dialog when opened with the loaded sequence of device commands example from the "Load Sequence" section described earlier.



The "HB Sequence Edit" dialog box contains a "Sequence Commands" table and a "Selected Sequence Command Item" section.

Index	Label	Delay ms	Cmd.	Parameter	Expt. Value	On Value <	On Value =	On Value >	On OK	On ERR
01	Init		OM	111						
02			IO	0000						
03	Start	1000	IO	0001						
04		1000	IO	0010						
05		1000	IO	0100						
06		1000	IO	0000					Start	

Buttons on the right: Copy, Paste, Delete, Add New, Insert New, Save, Exit.

**Selected Sequence Command Item**

Label:  On Value '<' do:  Update Sequence Command Line

Command:  On Value '<=' do:

Parameter:  On Value '>' do:  Clear Fields Help on OM

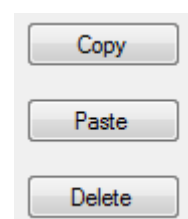
Delay ms:  On Result 'OK' do:

Expt. Value:  On Result 'ERR' do:  ☐ Auto Add / Insert New after Update

By selecting the "Copy" button, the currently highlighted sequence command in the "Sequence Commands" view will be copied to a local paste buffer.

By selecting the "Paste" button the sequence command currently stored in the local paste buffer will be inserted at the line before the highlighted sequence command line in the "Sequence Commands" view. The content of the label field if any will not be copied at this procedure.

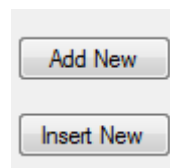
By selecting the "Delete" button, the currently highlighted sequence command in the "Sequence Commands" view will be deleted. If the deleted command had a defined label, all the references to this label will be cleared. Not the command line itself will be deleted, but the content of the field in which the label is referenced.



Buttons: Copy, Paste, Delete

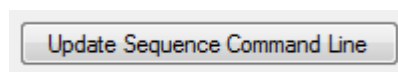
### 17.2.1 Adding or inserting a Sequence Command

By selecting the "Add New" button a new command line will be added to the end of the sequence commands in the "Sequence Commands" view and the fields of the "Selected Sequence Command Line" group box will be cleared.



By selecting the "Insert new" button a new command line will be inserted just before the currently selected command line in the "Sequence Commands" view and the fields of the "Selected Sequence Command Line" group box will be cleared.

The fields of the new command line can then be defined and updated by selecting the "Update Sequence Command Line" button.



#### 17.2.1.1 Add a Sequence command

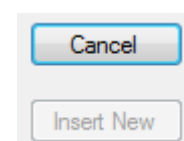
To explain the fields of the "Selected Sequence Command Item" group box let's add a new command to the end of the sequence command lines from the previous example. By selecting the "Add New" button, a new empty line is added to the sequence commands as shown below.

Sequence Commands										
Index	Label	Delay ms	Cmd.	Parameter	Expt. Value	On Value <	On Value =	On Value >	On OK	On ERR
01	Init		OM	111						
02			IO	0000						
03	Start	1000	IO	0001						
04		1000	IO	0010						
05		1000	IO	0100						
06		1000	IO	0000					Start	
07										

The content of the line will be reflected in the "Selected Sequence Command Item" group box where all the fields will be empty as shown below:

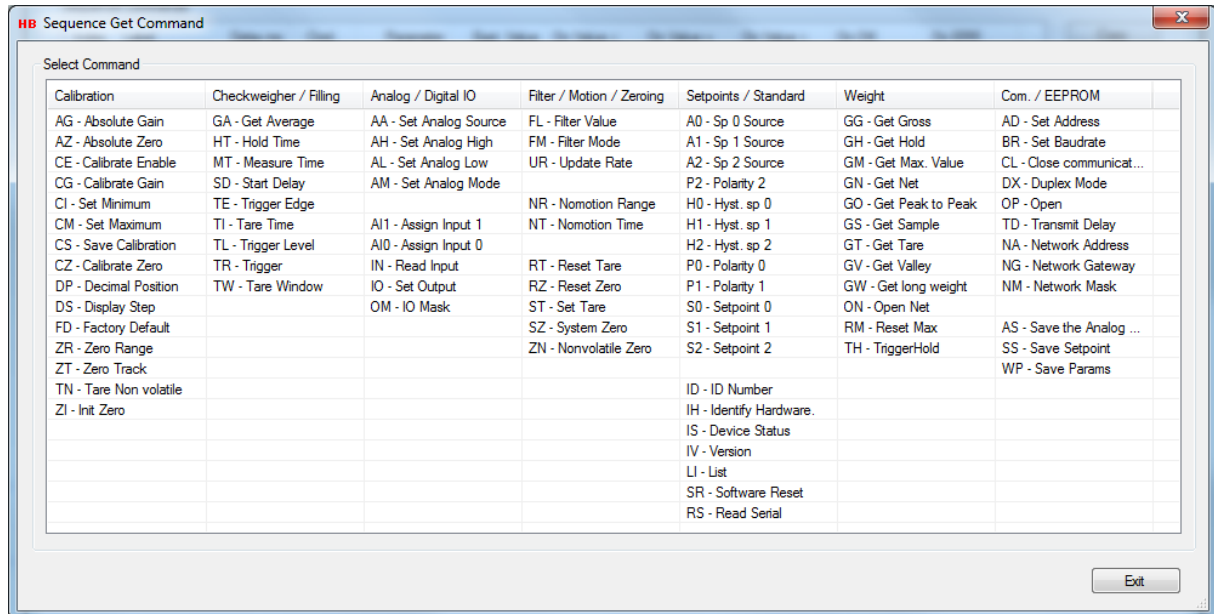
Selected Sequence Command Item			
Label:	<input type="text"/>	On Value '<' do:	<input type="button" value="Click to select"/>
		<input type="button" value="Update Sequence Command Line"/>	
Command:	<input type="button" value="Click to select"/>	On Value '=' do:	<input type="button" value="Click to select"/>
Parameter:	<input type="text"/>	On Value '>' do:	<input type="button" value="Click to select"/>
		<input type="button" value="Clear Fields"/>	<input type="button" value="Command Help"/>
Delay ms:	<input type="text"/>	On Result 'OK' do:	<input type="button" value="Click to select"/>
Expt. Value:	<input type="text"/>	On Result 'ERR' do:	<input type="button" value="Click to select"/>
		<input type="checkbox"/> Auto Add / Insert New after Update	

The text of the "Add New" button is changed to "Cancel" and by selecting the "Cancel" button the "Add New" operation will be canceled, and the newly added empty line will be removed from the "Sequence Commands" view.



The first thing to do is to select the device command to be used when executing the command line, we are defining now. This is done by clicking on the "Command" field "Click to select" and the "Sequence Get Command" dialog will appear.

Command:



The dialog shows all the available device commands for the currently connected device which can be used as a sequence command. The specific command to be used is selected by simply clicking on the command description in the "Select Command" view.

Let's select the "GN - Get Net" command which will be reflected in the "Command" field as shown. The Net value for the device will be read when the command line is executed. By selecting the command, the "Sequence Get Command" dialog will be closed, and the selected command inserted in the "Command" field. Selecting the "Exit" button will leave the "Command" field unchanged.

Command:

A label can be added to the command line by defining the "Label" field with a label name. Let's define a label called "End". The command line can now be jumped to from other command lines.

Label:

The "GN" command is sent without a parameter as it's a reading command. Only writing commands have parameters. So, in this case the field cannot be edited.

Parameter:

A delay can be defined meaning that the command line will not be executed before the defined amount of time in milliseconds is passed. Let's set it to 100 milliseconds.

Delay ms:

An expected response value can be defined. The value is expressed as the real expected value meaning that if a decimal point is expected this should also be defined.

Expt. Value:

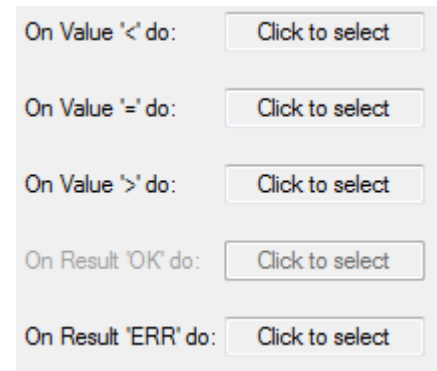
The condition for continuing an execution can then be defined based on the received value from a command execution.

Let's set the expected GN value to 1.000.

Based on the expected received response value after a command is executed and the received response value a condition can be set, so that the execution continues from a specific command line based on the received value.

Click on one of the condition fields to open the "Response Action" dialog. In this example case click on the "On Value '<' do" field to set a jump condition if the received response value is less than the expected value.

Notice that the "On Result 'OK' do" field is not enabled. To use this field, clear the content of the "Expt. Value" field and the "On Result 'OK' do" field will be enabled.



When the "Response Action" dialog is opened a list of labels is shown. A label can then be selected defining from where the execution should continue if the selected condition is fulfilled.

The list consists of predefined and user defined labels. In this case the label "Init" and "Start" is user defined in the current command sequence example.

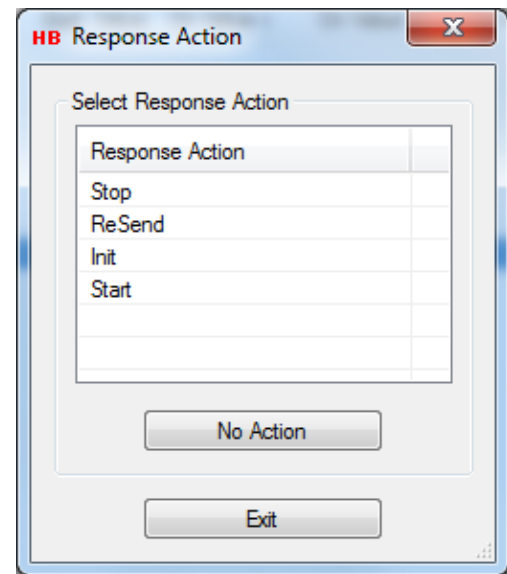
There are two predefined label which has a special meaning if selected.

The label "Stop" will make the command execution stop if the selected condition is fulfilled.

The label "ReSend" will make the command execution loop around and send the same command line to the device until the selected condition is no more fulfilled.

By selecting the "No Action" button, the selected condition field will be left empty.

By selecting the "Exit" button, the selected condition field will be left unchanged.



For the current example, select the "Start" label. The "Start" label will then be selected as jump condition and the dialog will be closed.

So now the execution will jump to the line with the "Start" label if the received value response from the Get Net "GN" command is less than 1.000.

Select the "Update Sequence Command Line" to update the new defined command line in the "Sequence Commands" view.

Update Sequence Command Line

The "Sequence Commands" view now looks like the figure below. We will later in the section "Editing a Sequence Command" remove "Start" label from line 6.

Sequence Commands										
Index	Label	Delay ms	Cmd.	Parameter	Expt. Value	On Value <	On Value =	On Value >	On OK	On ERR
01	Init		OM	111						
02			IO	0000						
03	Start	1000	IO	0001						
04		1000	IO	0010						
05		1000	IO	0100						
06		1000	IO	0000					Start	
07	End	100	GN		1.000	Start				

### 17.2.1.2 Insert a Sequence command

To continue explaining the fields of the "Selected Sequence Command Item" group box let's insert a new command at line 3 of the sequence commands lines from the previous example explained in the section covering the "Add a Sequence Command". Refer to this section for more detailed figures.

By selecting the "Insert New" button, a new empty line is added to the sequence commands just before the currently selected sequence command line as shown below where a new line is inserted before line 4.

Sequence Commands										
Index	Label	Delay ms	Cmd.	Parameter	Expt. Value	On Value <	On Value =	On Value >	On OK	On ERR
01	Init		OM	111						
02			IO	0000						
03										
04	Start	1000	IO	0001						
05		1000	IO	0010						
06		1000	IO	0100						
07		1000	IO	0000					Start	
08	End	100	GN		1.000	Start				

The text of the "Insert New" button is changed to "Cancel" and by selecting the "Cancel" button the "Insert New" operation will be canceled, and the newly added empty line will be removed from the "Sequence Commands" view.

To continue the example from the section covering the "Add a Sequence Command", click on the "Command" field in the "Selected Sequence Command Item" and select the "ST – Set Tare" command from the "Sequence Get Command" dialog.

Command:

A label can be added to the command line by defining the "Label" field with a label name. In this case we leave the "Label" field unchanged.

Label:

The "ST" command is sent without a parameter as it's a 'write with no parameters' command. Only some of the writing commands for a device have parameters. So, in this case the field cannot be edited.

Parameter:

A delay can be defined meaning that the command line will not be executed before the defined amount of time in milliseconds is passed. Let's set it to 100 milliseconds.

Delay ms:

The response from a Set Tare "ST" command can only be 'OK' or 'ERR' so no expected values can be set for this command. So, in this case the field cannot be edited.

Expt. Value:

As seen from the figure, the conditions value field cannot be selected as no values can be received as command response, as the Set Tare "ST" command do not return a value. Anyway, conditions for receiving an "OK" or "ERR" can be set.

Click on one of the condition fields to open the "Response Action" dialog. In this example case click on the "On Result ERR do:" field to set a jump condition if the received response value is ERR.

On Value '<' do:

On Value '=' do:

On Value '>' do:

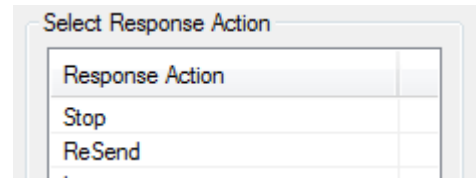
On Result 'OK' do:

On Result 'ERR' do:

When the "Response Action" dialog is opened select the "ReSend" label.

For further explanation of the "Response Action" dialog refer to the section covering the "Add a Sequence Command"

The label "ReSend" will make the command execution loop around and send the same command line to the device until the selected condition is no more fulfilled.



When executing a Set Tare "ST" command an "ERR" will be returned as response if the scale is not steady enough for doing a tarring, so we will loop the command with a delay of 100 milliseconds until the scale is steady enough to do a tarring.

On Result 'ERR' do: ReSend

We can also for the example define a condition for a sequence command line to jump to when the tarring succeeds.

Click on the condition field "On result 'OK' do" field and select the user defined label "End".

On Result 'OK' do: End

So now when tarring succeeds the execution will jump to the line with the "End" label which is the line with the Get Net 'GN' command, which again if condition for this line is fulfilled will jump to the line with the "Start" label.

Select the "Update Sequence Command Line" to update the new defined command line in the "Sequence Commands" view.

Update Sequence Command Line

The "Sequence Commands" view now looks like the figure below. We will later in the section "Editing a Sequence Command" remove "Start" label from line 7.

Index	Label	Delay ms	Cmd.	Parameter	Expt. Value	On Value <	On Value =	On Value >	On OK	On ERR
01	Init		OM	111						
02			IO	0000						
03		100	ST						End	ReSend
04	Start	1000	IO	0001						
05		1000	IO	0010						
06		1000	IO	0100						
07		1000	IO	0000					Start	
08	End	100	GN		1.000	Start				

### 17.2.2 Editing a Sequence Command

By selecting a sequence command line in the "Sequence Commands" view, the content of the command fields will be copied to the fields of the "Selected Sequence Command Line" group box from where the content of the command line can be edited. Select the "Update Sequence Command Line" button to update the selected command line with the changes.

To explain how to edit the fields of the "Selected Sequence Command Item" group box let's select line 7 from the previous example:

Sequence Commands										
Index	Label	Delay ms	Cmd.	Parameter	Expt. Value	On Value <	On Value =	On Value >	On OK	On ERR
01	Init		OM	111						
02			IO	0000						
03		100	ST						End	ReSend
04	Start	1000	IO	0001						
05		1000	IO	0010						
06		1000	IO	0100						
07		1000	IO	0000					Start	
08	End	100	GN		1.000	Start				

The content of the line will be reflected in the "Selected Sequence Command Item" group box like this:

Selected Sequence Command Item

Label:

On Value '<' do:

Command:

On Value '=' do:

Parameter:

On Value '>' do:

Delay ms:

On Result 'OK' do:

Expt. Value:

On Result 'ERR' do:

☐ Auto Add / Insert New after Update

We want to remove the "Start" label in the "On Result 'OK' do" field.

On Result 'OK' do:

Click on the "On result 'OK' do" field to open the Response Action" dialog.

Select the "No Action" button to clear the content of the "On Result 'OK' do" field.

HB Response Action

Select Response Action

Response Action

Stop

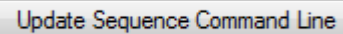
ReSend

Init

Start

End

Select the "Update Sequence Command Line" to update the new defined command line in the "Sequence Commands" view.

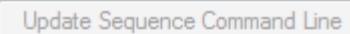
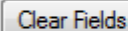
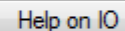
A rectangular button with a light gray border and a light gray background, containing the text "Update Sequence Command Line" in a blue, sans-serif font.

### 17.2.3 Other Edit Sequence Command Features

To clear all the fields in the "Selected Sequence Command Item" group box, select the "Clear Fields" button.

If the user is connected to the internet, selecting the help button "Help on (Command)" will give access to the help page for the currently selected command in the "Command" field.

By checking the "Auto Add / Insert New after Update" check box, a new empty line will automatic be added or inserted in the Sequence Commands list, ready for defining a new sequence command line after the "Update Sequence Command Line" button has been selected.

A rectangular button with a light gray border and a light gray background, containing the text "Update Sequence Command Line" in a blue, sans-serif font.A rectangular button with a light gray border and a light gray background, containing the text "Clear Fields" in a blue, sans-serif font.A rectangular button with a light gray border and a light gray background, containing the text "Help on IO" in a blue, sans-serif font.

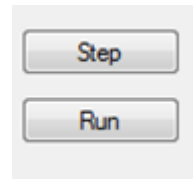
☐ Auto Add / Insert New after Update

The sequence of command lines can be saved to a disk file by selecting the "Save" button.

A rectangular button with a light gray border and a light gray background, containing the text "Save" in a blue, sans-serif font.

### 17.3 Execute Command Sequence

In the "Sequence" dialog, the execution of sequence commands will start from the currently selected sequence command line and can be started by selecting either the "Step" button or the "Run" button.

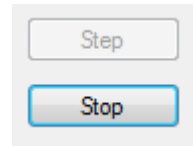


By selecting the "Step" button, only the currently selected command line in the "Sequence Commands" view will be executed after which the next command line will be highlighted.

By selecting the "Run" button, the sequence command lines will be executed continuously until a "Stop" condition occurs.

The currently executed command will always be highlighted in the "Sequence Commands" view.

When the execution of the sequence commands is started the text of the "Step" or "Run" button is changed to "Stop" and by selecting the "Stop" button the ongoing command execution will be stopped.



After the editing described in the previous sections, the resulting list of sequence command are as shown in the figure below.

Index	Label	Delay ms	Cmd.	Parameter	Expt. Value	On Value <	On Value =	On Value >	On OK	On ERR
01	Init		OM	111						
02			IO	0000						
03		100	ST						End	ReSend
04	Start	1000	IO	0001						
05		1000	IO	0010						
06		1000	IO	0100						
07		1000	IO	0000						
08	End	100	GN		1.000	Start				

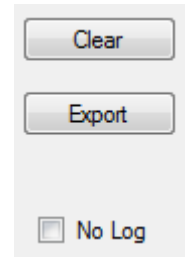
The result of the command execution is logged ongoing and can be examined in the "Runtime Sequence Log" view as the example figure shows below where the execution of the commands from the figure above has been started from line 1.

Line	Index	Label	Delay ms	Cmd.	Parameter	Expt. Value	Resp. Value	Status	Action
01	01	Init		OM	111		OK	Done	
02	02			IO	0000		OK	Done	
03	03		100	ST			OK	Done	End
04	08	End	100	GN		1.000	0.000	Done	Start
05	04	Start	1000	IO	0001		OK	Done	
06	05		1000	IO	0010		OK	Done	
07	06		1000	IO	0100		OK	Done	
08	07		1000	IO	0000		OK	Done	
09	08	End	100	GN		1.000	0.000	Done	Start
10	04	Start	1000	IO	0001		OK	Done	
11	05		1000	IO	0010		OK	Done	
12	06		1000	IO	0100		OK	Done	
13	07		1000	IO	0000		OK	Done	
14	08	End	100	GN		1.000	4.589	Done	Stop

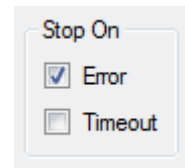
By selecting the "Clear" button in the "Runtime Sequence Log" view, the content of the "Runtime Sequence Log" view will be deleted.

By selecting the "Export" button in the "Runtime Sequence Log" view, the content of the "Runtime Sequence Log" view can be exported to a CSV file for further inspection.

By checking the "No Log" check box the logging to the "Runtime Sequence Log" view will be stopped. By unchecking the "No Log" checkbox the logging of the executed commands will continue.



By checking the "Error" and / or the "Timeout" checkbox in the "Stop On" group box located in the "Sequence Commands" view, the execution will in general always be stopped if one of the checked conditions are fulfilled no matter what other conditions are defined for the different sequence of device commands.



## 18 Communication

The "Communication" button opens different communication setup dialogs for devices connected through a serial interface, depending on the currently selected device.

The "Communication Setup" dialog for setting up communication parameters for the device will be opened by selection of the button.

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

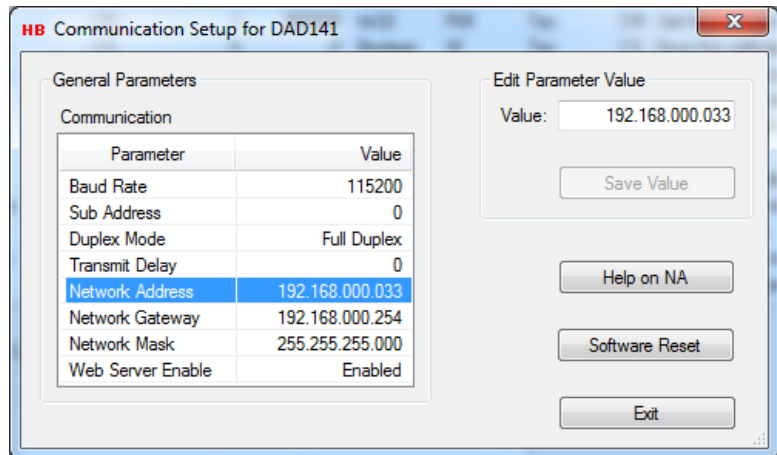
### 18.1 Communication Setup Dialog

From the "Communication Setup" dialog, communication command parameters can be changed for the selected device which must be a device connected through a serial interface.

#### 18.1.1 General Parameters

In the "General Parameters" group box, the "Communication" list view contains the communication command parameters valid for the currently selected device.

The number of command parameters can vary depending on the currently selected device. By selecting one of parameters for editing, the parameter and its current value will be reflected in the "Edit Parameter Value" group box.



Parameter	Value
Baud Rate	115200
Sub Address	0
Duplex Mode	Full Duplex
Transmit Delay	0
Network Address	192.168.000.033
Network Gateway	192.168.000.254
Network Mask	255.255.255.000
Web Server Enable	Enabled

#### 18.1.2 Edit Parameter Value

In the "Edit Parameter Value" group box the value of the selected communication parameter can be changed. Select the "Save Value" button to save the changed parameter value to EEPROM.

#### 18.1.3 Software Reset

Selecting the "Software Reset" button resets the device and returns to the caller of the Commands View dialog. The device may have to be reconnected after the reset.

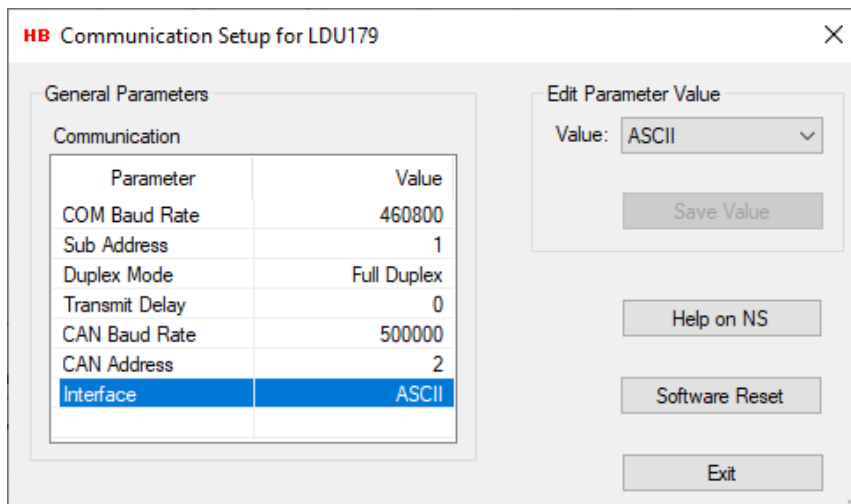
#### 18.1.4 Help on (Command)

If the user is connected to the internet, selecting the help button "Help on (Command)" will give access to the help page for the currently highlighted communication parameter.

## 18.2 ASCII to Modbus RTU Interface change

From the "Communication Setup" dialog it is possible to change from ASCII interface to Modbus RTU interface if these interfaces are supported by the device.

The figures below show how to change an ASCII interface to Modbus RTU interface.



**HB Communication Setup for LDU179**

General Parameters

Communication

Parameter	Value
COM Baud Rate	460800
Sub Address	1
Duplex Mode	Full Duplex
Transmit Delay	0
CAN Baud Rate	500000
CAN Address	2
Interface	ASCII

Edit Parameter Value

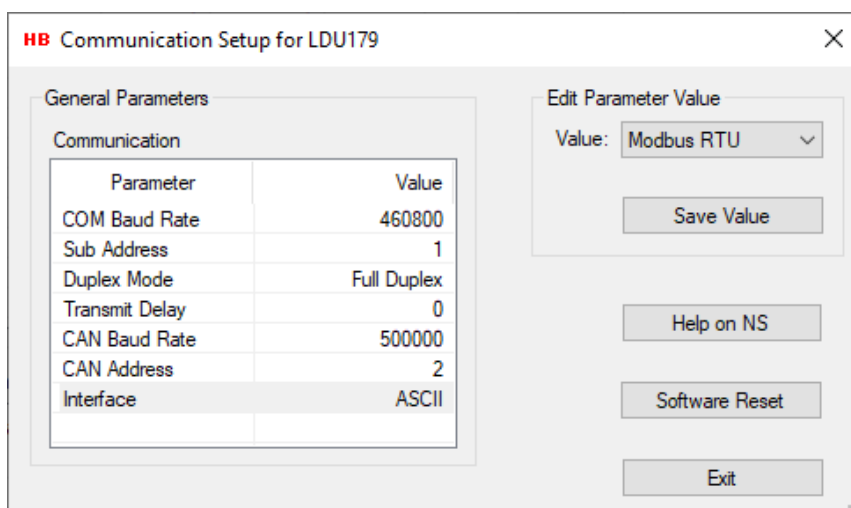
Value: ASCII

Save Value

Help on NS

Software Reset

Exit



**HB Communication Setup for LDU179**

General Parameters

Communication

Parameter	Value
COM Baud Rate	460800
Sub Address	1
Duplex Mode	Full Duplex
Transmit Delay	0
CAN Baud Rate	500000
CAN Address	2
Interface	Modbus RTU

Edit Parameter Value

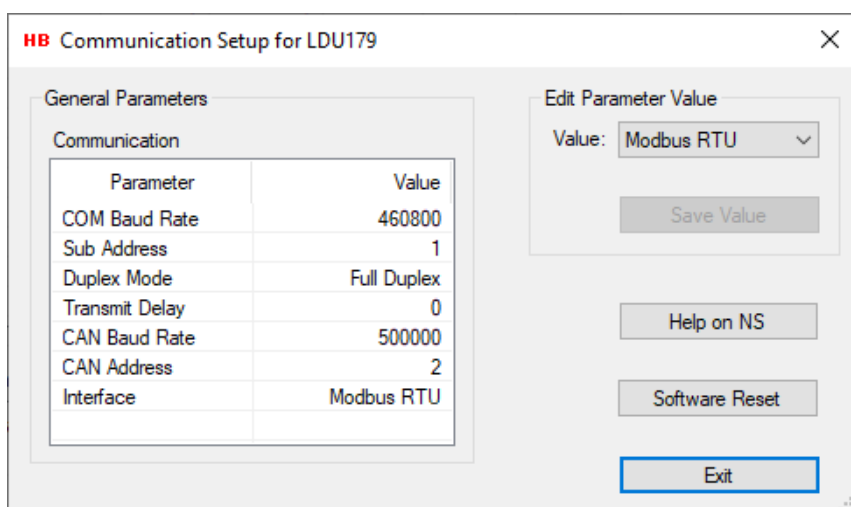
Value: Modbus RTU

Save Value

Help on NS

Software Reset

Exit



**HB Communication Setup for LDU179**

General Parameters

Communication

Parameter	Value
COM Baud Rate	460800
Sub Address	1
Duplex Mode	Full Duplex
Transmit Delay	0
CAN Baud Rate	500000
CAN Address	2
Interface	Modbus RTU

Edit Parameter Value

Value: Modbus RTU

Save Value

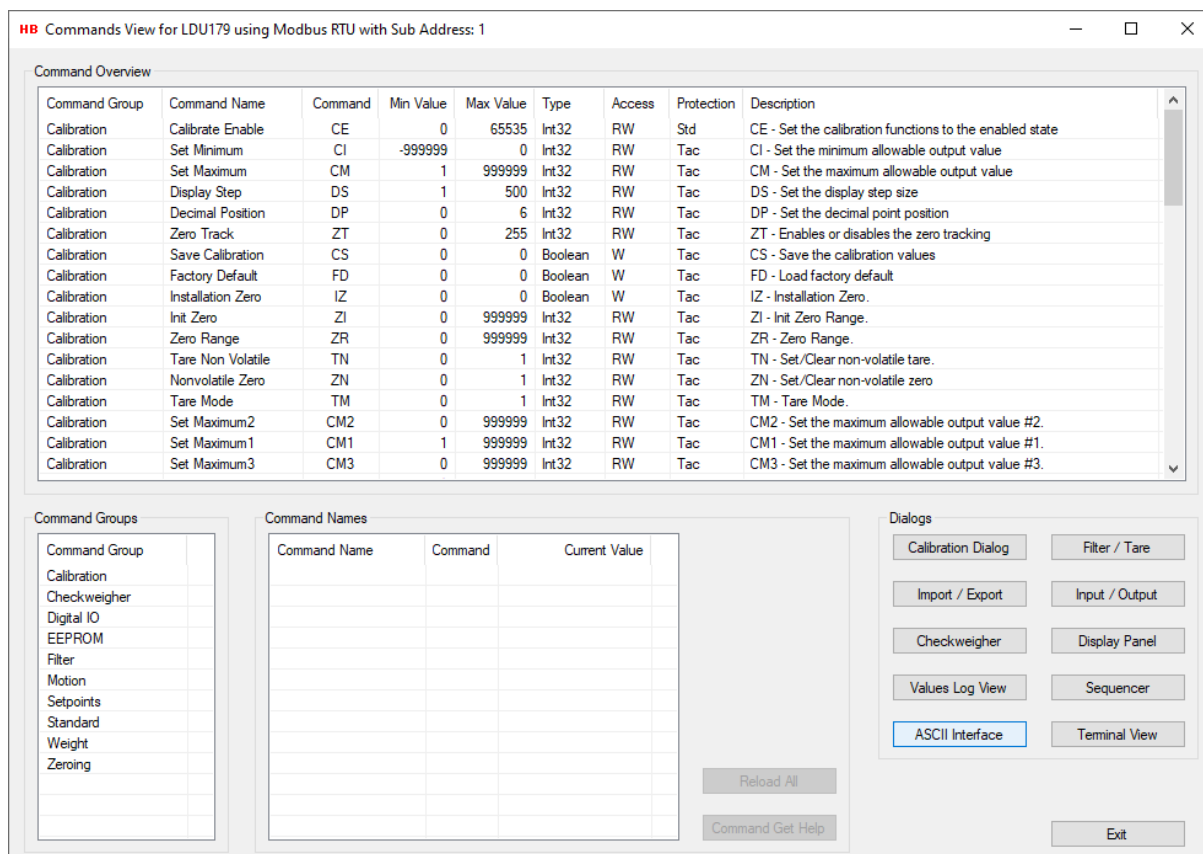
Help on NS

Software Reset

Exit

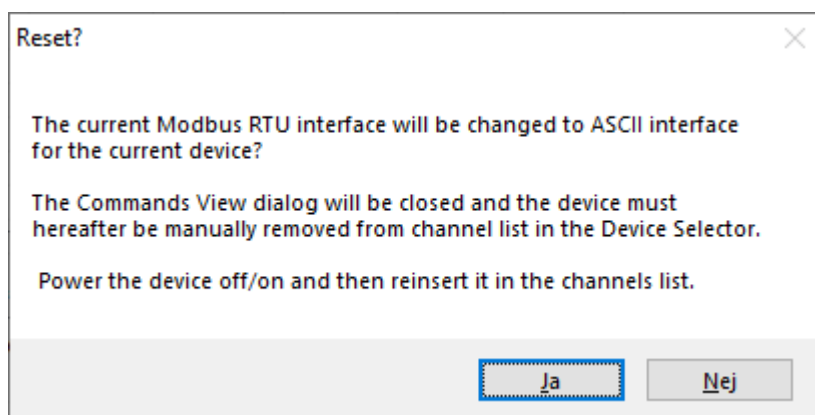
### 18.3 Modbus RTU to ASCII Interface change

If Modbus RTU interface is selected and the device has repowered, the text of the communication button will be changed from "Communication" to "ASCII Interface" as shown in the figure below.



Selecting the "ASCII Interface" button will change the current Modbus RTU interface to ASCII interface.

The following message will be displayed:



## 19 The Terminal View

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

The "Terminal View" dialog comes in four versions, one version for devices using Serial COM and Serial LAN as communication interface, one version for devices using CANopen as communication interface, one version for devices using Modbus as communication interface and one version for devices using Profibus as communication interface.

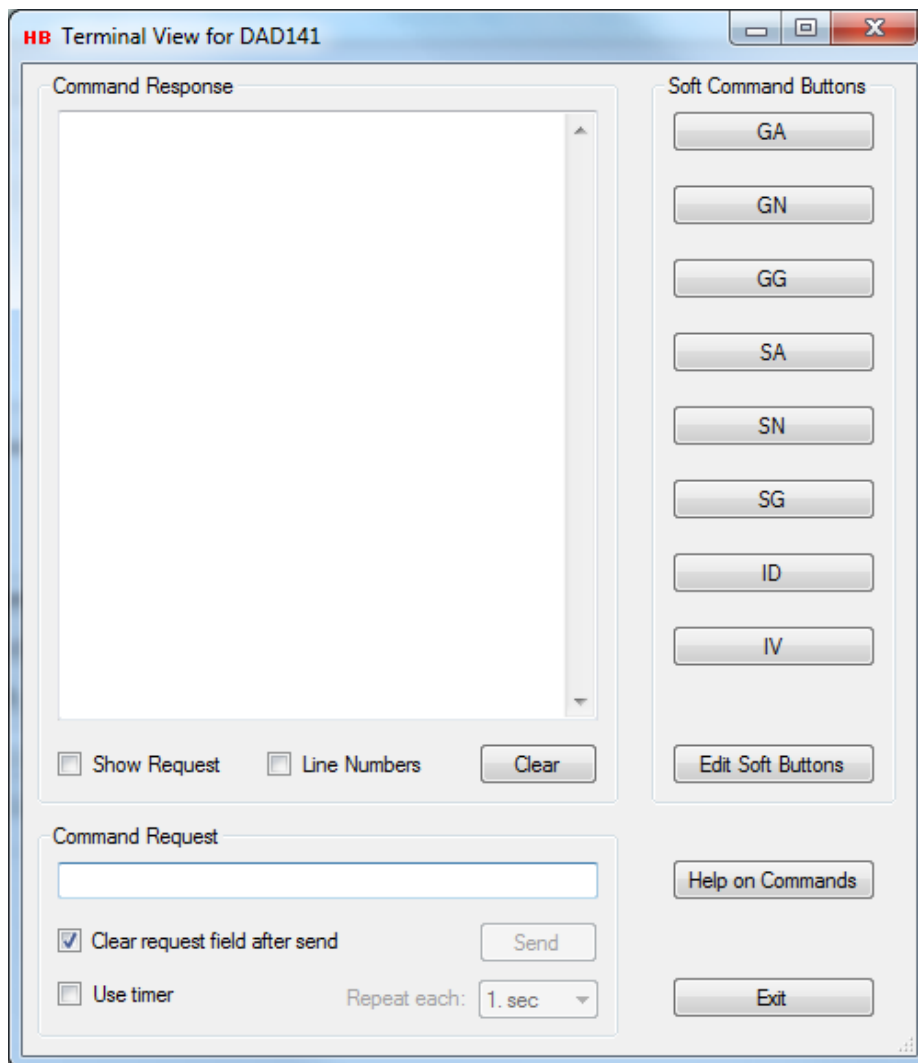
The "Terminal View" dialog can be accessed from the "Device Selector" dialog.

The "Terminal View" dialog can also be accessed from popup menus in the main window by moving the mouse to the display window of an active channel and select by clicking as described in later sections.

### 19.1 Terminal View dialog, the Serial COM version

The "Terminal View" dialog for serial COM and the Serial LAN interface devices consists of a "Command Request" group box containing the tools for sending command parameter requests, and a "Command Response" group box containing the tools for displaying the command responses in the "Command Response" text box.

Also, several editable soft command buttons are available.



### 19.1.1 Command request

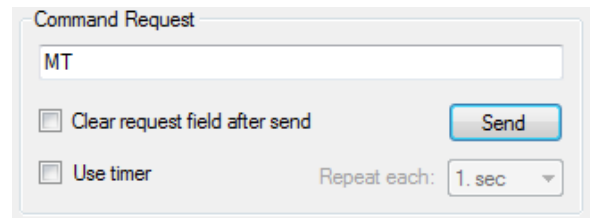
By typing a command name in the "Command Request" text field with or without a parameter value and selecting the "Send" button, the entered command string will be sent to the H&B device as an ASCII string.

The response if any will be displayed in the "Command Response" text box.

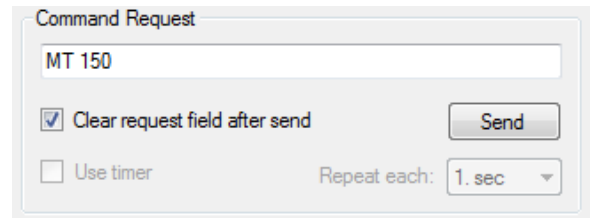
See the help section on how to get a list of valid serial COM command names, if connected to the internet.

There is no check for the validity of the entered command. The entered ASCII string will be sent to the device as is.

A command sent without a parameter value will normally, by the device, be interpreted as a value read request for that command.

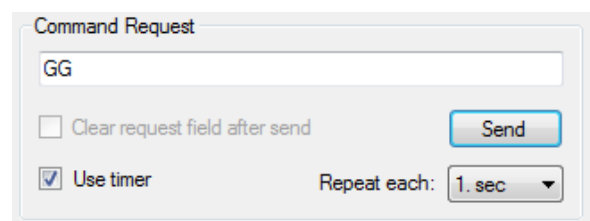


A command sent with a parameter value will normally, by the device, be interpreted as a write value request for that command.



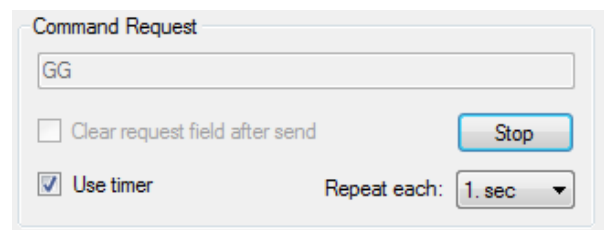
By checking the "Clear request field after send" check box, the content of the command line in the "Command Request" text field will be cleared after the command is sent.

By checking the "Use timer" check box, the current command in the "Command Request" text field will be sent repeatedly with a repeat time as specified by the timer value in the "Repeat each" drop down box. It's not possible to check the "Use timer" check box, if the "Clear request field after send" check box is checked.



By selecting the "Send" button, with the "Use timer" check box checked, the repeated send of the current command in the "Command Request" text box will be started. The text of the "Send" button will be changed to "Stop" and selecting this button will stop the repeated send of the current command in the "Command Request" text box.

You can still while the timer is running change the repeat time by which the current command will be sent. By selecting the "Stop" button or removing the check from the "Use Timer" check box, the timer will be stopped.



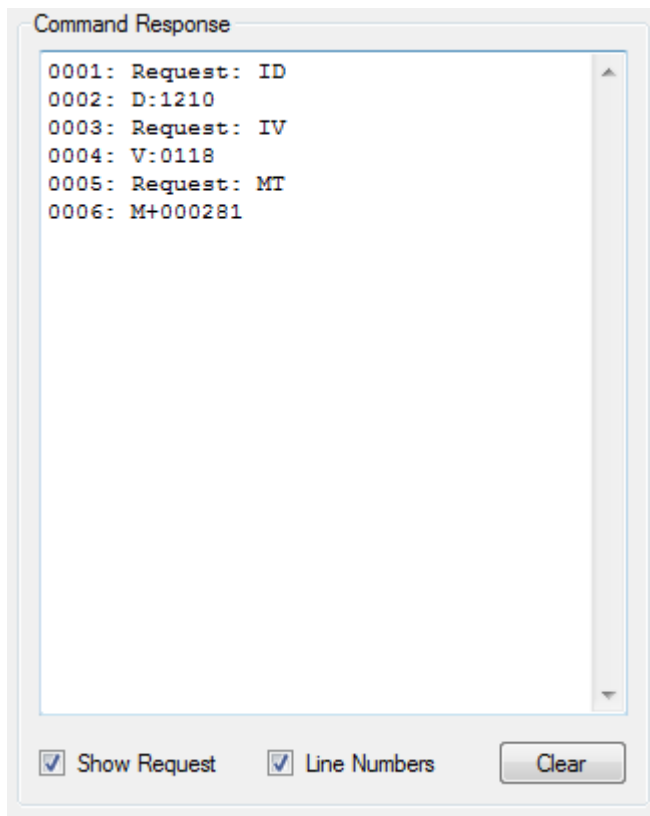
### 19.1.2 Command response

In the "Command Response" text box, all the input ASCII strings received from the current H&B device will be displayed as received without any filtering.

If the "Show Request" check box is checked, the ASCII string entered in the "Command Request" text field will be displayed in the "Command Response" text box when sent.

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

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



### 19.1.3 Soft Command Buttons

By selecting one of the buttons in the "Soft Command Buttons" the text of the button will be sent to the device.

The content of the soft command buttons can be changed by selecting the "Edit Soft Buttons" button.

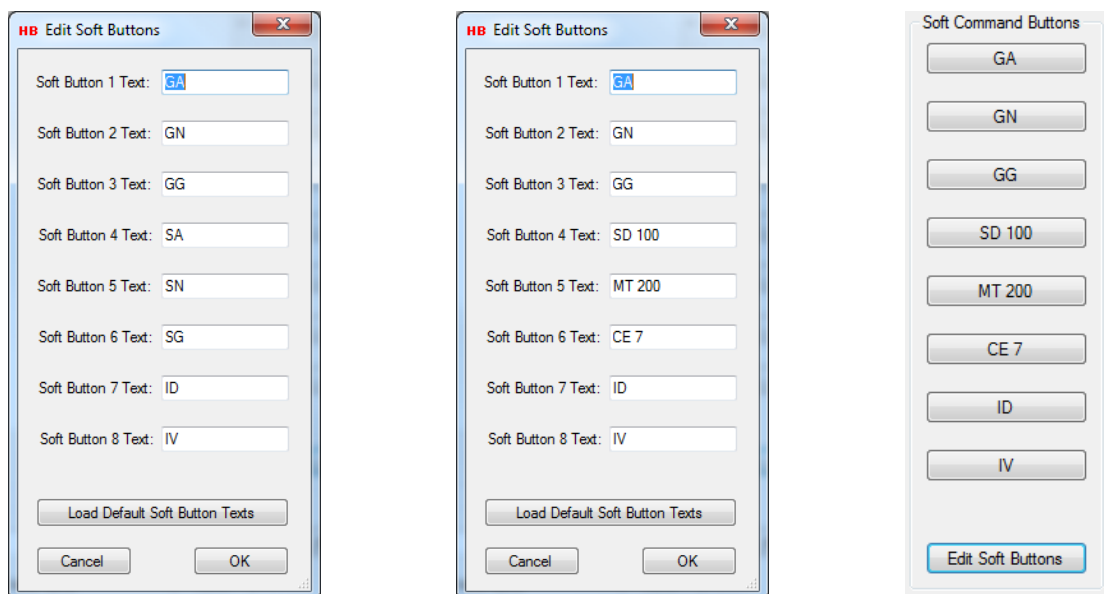
The figure at the right shows the default soft command buttons set.



#### 19.1.3.1 Edit Soft Buttons

From the "Edit Soft Buttons" dialog, the value of the soft buttons can be changed and automatically saved for future use of the DOP 4 application.

The value of the soft buttons can be reset to default by selecting the "Load Default Soft Button Texts" button.



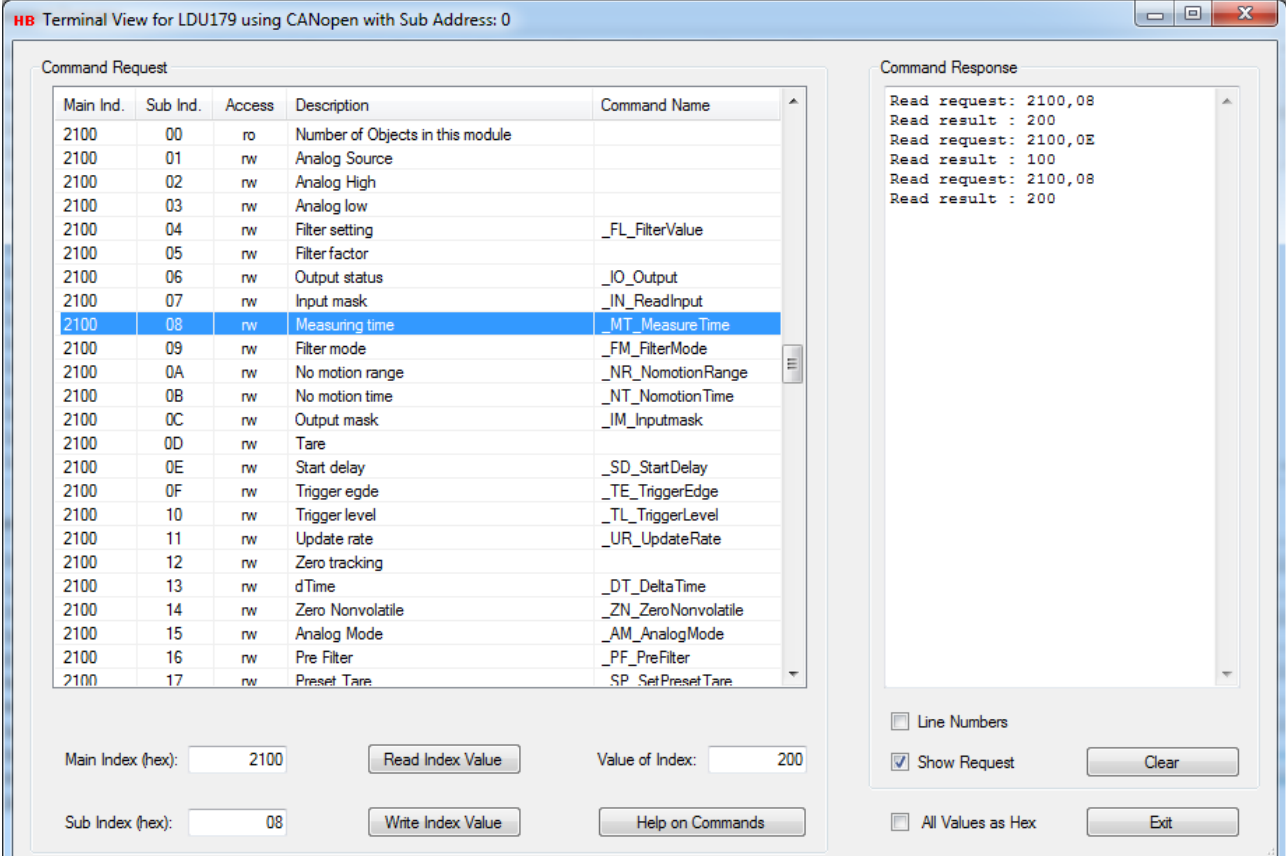
### 19.1.4 Help

If the user is connected to the internet, selecting the help button "Help" will give access to a list of common commands which can be used in the "Command Request" text field.

## 19.2 Terminal View dialog, the CANopen version

The "Terminal View" dialog for CANopen interface devices consist 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.

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



**Command Request**

Main Ind.	Sub Ind.	Access	Description	Command Name
2100	00	ro	Number of Objects in this module	
2100	01	rw	Analog Source	
2100	02	rw	Analog High	
2100	03	rw	Analog low	
2100	04	rw	Filter setting	_FL_FilterValue
2100	05	rw	Filter factor	
2100	06	rw	Output status	_IO_Output
2100	07	rw	Input mask	_IN_ReadInput
2100	08	rw	Measuring time	_MT_MeasureTime
2100	09	rw	Filter mode	_FM_FilterMode
2100	0A	rw	No motion range	_NR_NomotionRange
2100	0B	rw	No motion time	_NT_NomotionTime
2100	0C	rw	Output mask	_IM_Inputmask
2100	0D	rw	Tare	
2100	0E	rw	Start delay	_SD_StartDelay
2100	0F	rw	Trigger egde	_TE_TriggerEdge
2100	10	rw	Trigger level	_TL_TriggerLevel
2100	11	rw	Update rate	_UR_UpdateRate
2100	12	rw	Zero tracking	
2100	13	rw	dTime	_DT_DeltaTime
2100	14	rw	Zero Nonvolatile	_ZN_ZeroNonvolatile
2100	15	rw	Analog Mode	_AM_AnalogMode
2100	16	rw	Pre Filter	_PF_PreFilter
2100	17	rw	Preset Tare	_SP_SetPresetTare

Main Index (hex):   Value of Index:

Sub Index (hex):

**Command Response**

```
Read request: 2100,08
Read result : 200
Read request: 2100,0E
Read result : 100
Read request: 2100,08
Read result : 200
```

☐ Line Numbers ☒ Show Request

☐ All Values as Hex

### 19.2.1 Command request

The "Command Request" group box contains a list view with the complete set of CANopen commands supported by the H&B CANopen interface-based devices.

Each line in the list view contains the definition and information for a given CANopen command defined by a "Main Index" and a "Sub Index" value. If the "Command Name" field contains a name, it's the name of the corresponding H&B general device command.

By selecting a line in the "Command Request" list view, the value of the command parameter will, if possible, be read and displayed in the "Command Response" text box. The main and sub index values will also be read to the corresponding index fields.

If a valid integer value is entered in the "Value of Index" text field, and the "Write Index Value" button is selected, the value will, if possible, be written to the device 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.

A main and sub index can manually be defined 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 "Value of Index" Field and in the "Command Response" text box.

Command Request

Main Ind.	Sub Ind.	Access	Description	Command Name
2100	00	ro	Number of Objects in this module	
2100	01	rw	Analog Source	
2100	02	rw	Analog High	
2100	03	rw	Analog low	
2100	04	rw	Filter setting	_FL_FilterValue
2100	05	rw	Filter factor	
2100	06	rw	Output status	_IO_Output
2100	07	rw	Input mask	_IN_ReadInput
2100	08	rw	Measuring time	_MT_MeasureTime
2100	09	rw	Filter mode	_FM_FilterMode
2100	0A	rw	No motion range	_NR_NoMotionRange
2100	0B	rw	No motion time	_NT_NoMotionTime
2100	0C	rw	Output mask	_IM_Inputmask
2100	0D	rw	Tare	
2100	0E	rw	Start delay	_SD_StartDelay
2100	0F	rw	Trigger egde	_TE_TriggerEdge
2100	10	rw	Trigger level	_TL_TriggerLevel
2100	11	rw	Update rate	_UR_UpdateRate
2100	12	rw	Zero tracking	
2100	13	rw	dTime	_DT_DeltaTime
2100	14	rw	Zero Nonvolatile	_ZN_ZeroNonvolatile
2100	15	rw	Analog Mode	_AM_AnalogMode
2100	16	rw	Pre Filter	_PF_PreFilter
2100	17	rw	Preset Tare	_SP_SetPresetTare

Main Index (hex):   Value of Index:

Sub Index (hex):

If the user is connected to the internet, selecting the help button "Help on Commands" will give access to a list of common CANopen commands.


### 19.2.2 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 device will be displayed as received or sent.

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.

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

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



The screenshot shows a window titled "Command Response". Inside is a text area with the following content:

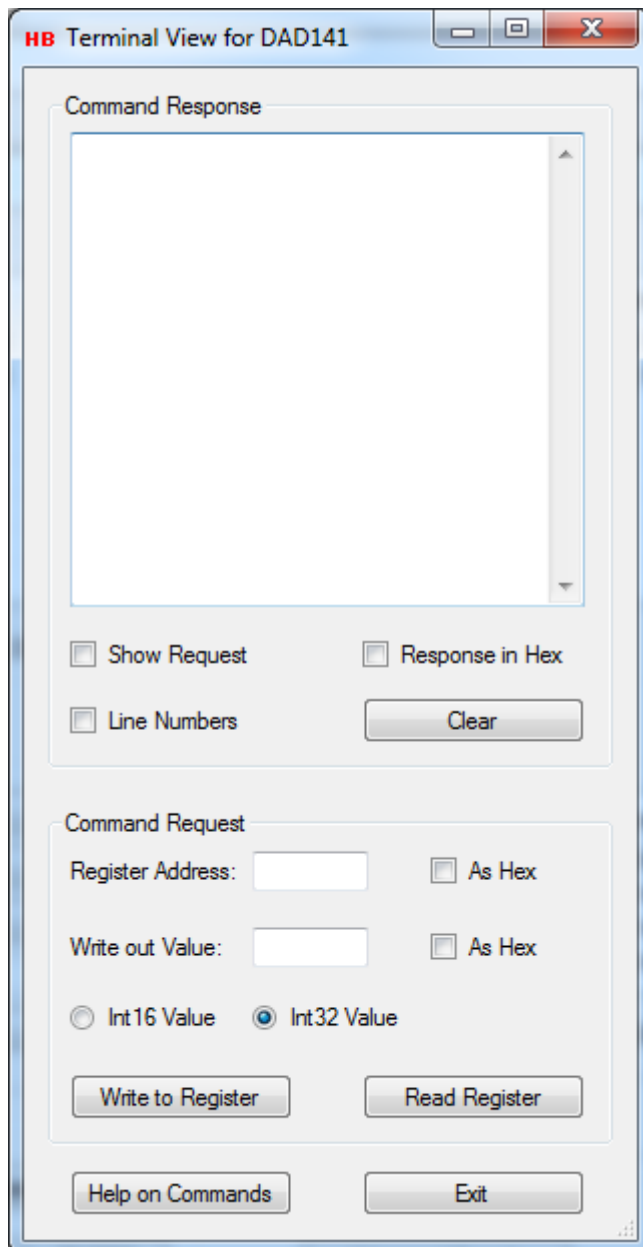
```
Read request: 2100,04
Read result : 3
Send request: 2100,04 4
Send result : OK
Read request: 2100,04
Read result : 4
```

Below the text area are three checkboxes and two buttons:

- ☐ Line Numbers
- ☒ Show Request
- ☐ All Values as Hex
- Clear button
- Exit button

### 19.3 Terminal View dialog, the Modbus version

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

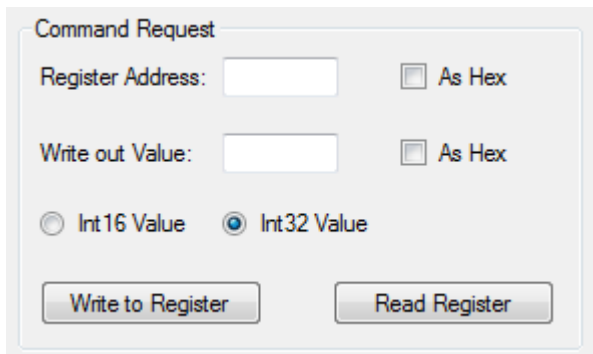


If the user is connected to the internet, selecting the help button "Help on Commands" will give access to a list of valid Modbus indexes.

### 19.3.1 Command request

In the "Register Address" field a register address for reading or writing is entered. If the "As Hex" checkbox to the right of the "Register Address" field is checked, the field value will be interpreted as a hexadecimal value.

In the "Write out Value" a value to be written to the specified register address is entered. If the "As Hex" checkbox to the right of the "Write out Value" field is checked, the field value will be interpreted as a hexadecimal value.



With the radio buttons "Int 16 Value" and "Int 32 Value" the value length of the specified register address is defined as either a 16 bit or 32 bit integer value. Selecting the "Help on Commands" button, the shown Modbus indexes will show the length of the register values.

Selecting the "Write to Register" button will write the value of the "Write out Value" field to the defined register address.

Selecting the "Read Register" button will read the value from the defined register address and show the value in the "Command Response" text box.

The response if any will be displayed in the "Command Response" text box.

### 19.3.2 Command response

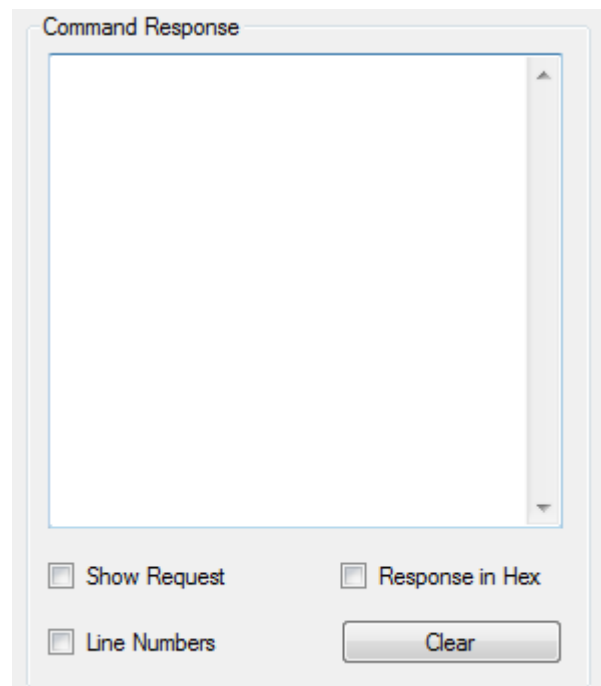
In the "Command Response" text box, all the input and output parameter values for a given command received from the current device will be displayed as read or write results.

If the "Show Request" check box is checked, the read or write request for the value of a register address is displayed in the "Command Response" text box.

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

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

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



## 19.4 Terminal View dialog, the Profibus version

The "Terminal View" dialog for Profibus interface devices consists of a "Command Request" group box containing the tools for sending read and write command parameter requests, and a "Command Response" group box containing the tools for displaying the command responses in the "Command Response" text box.

The screenshot shows a software window titled "HB Terminal View for DAD142". It features a "Command Response" section with a large text area and a "Command Request" section with input fields and buttons. The "Command Response" section includes a "Show Request" checkbox, a "Line Numbers" checkbox, and a "Clear" button. The "Command Request" section includes fields for "Write Command", "Read Command", "Write Index", "Read Index", and "Write out Value", along with "Write Request" and "Read Request" buttons. At the bottom, there are "Help on Commands" and "Exit" buttons.

Command Response	
<div></div>	
<input type="checkbox"/> Show Request	<input type="checkbox"/> Line Numbers
Clear	

Command Request	
Write Command: <input type="text"/>	Read Command: <input type="text"/>
Write Index: <input type="text"/>	Read Index: <input type="text"/>
Write out Value: <input type="text"/>	
Write Request	Read Request

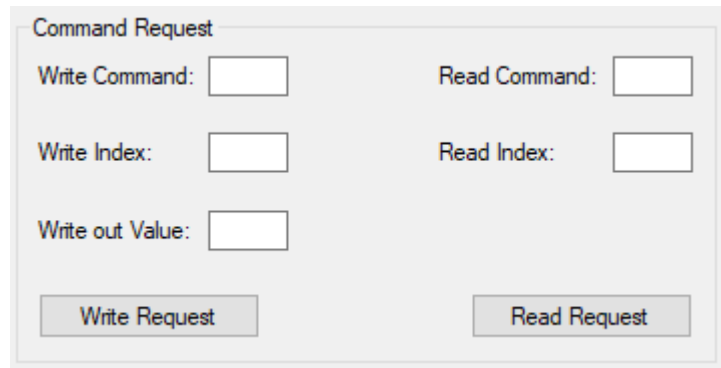
Help on Commands	Exit
------------------	------

If the user is connected to the internet, selecting the help button "Help on Commands" will give access to a list of valid commands to be used with the connected device.

### 19.4.1 Command request

In the "Write Command" field a write command value is entered together with a write command index entered in the "Write Index" field for writing the value of the "Write out Value" field to the connected device.

By selecting the "Write Request" button, the value of the "Write out Value" field will be written to the device.



In the "Read Command" field a read command value is entered together with a read command index entered in the "Read Index" field for reading a command parameter value from the connected device.

Selecting the "Read Request" button will read the requested command value from the device and show the value in the "Command Response" text box.

The response if any of the read or write request, will be displayed in the "Command Response" text box.

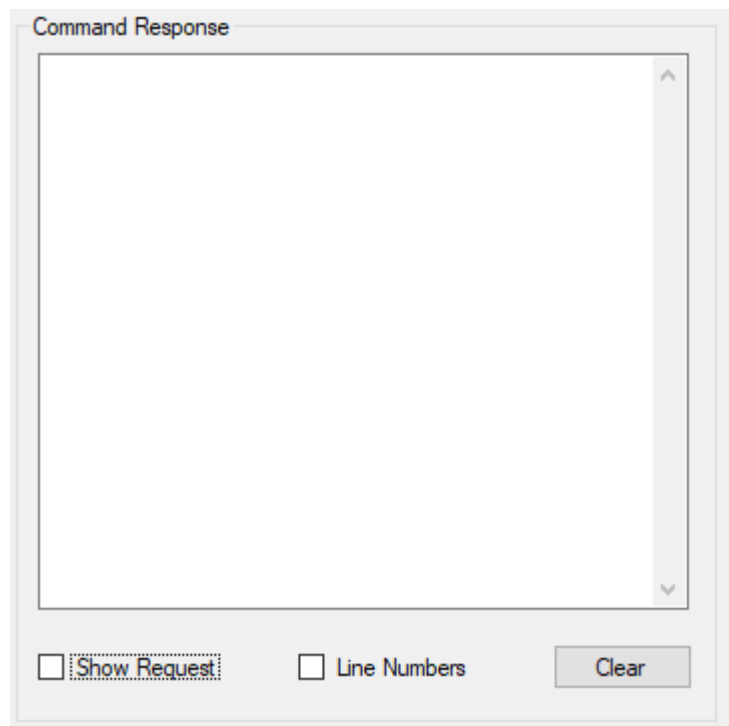
### 19.4.2 Command response

In the "Command Response" text box, all the input and output parameter values for a given command received from the current device will be displayed as read or write results.

If the "Show Request" check box is checked, the read or write request for the value of a request command is displayed in the "Command Response" text box.

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

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



## 20 The Main Window

From the main window, recording of the net or gross data stream from up to four connected H&B devices can be performed.

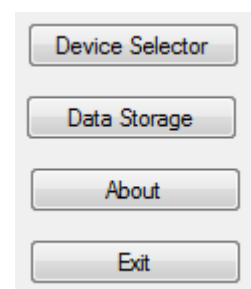
First thing to do after startup of the DOP 4 application is to assign one or more H&B devices to one or more of the device channels, as described in earlier sections of this manual.



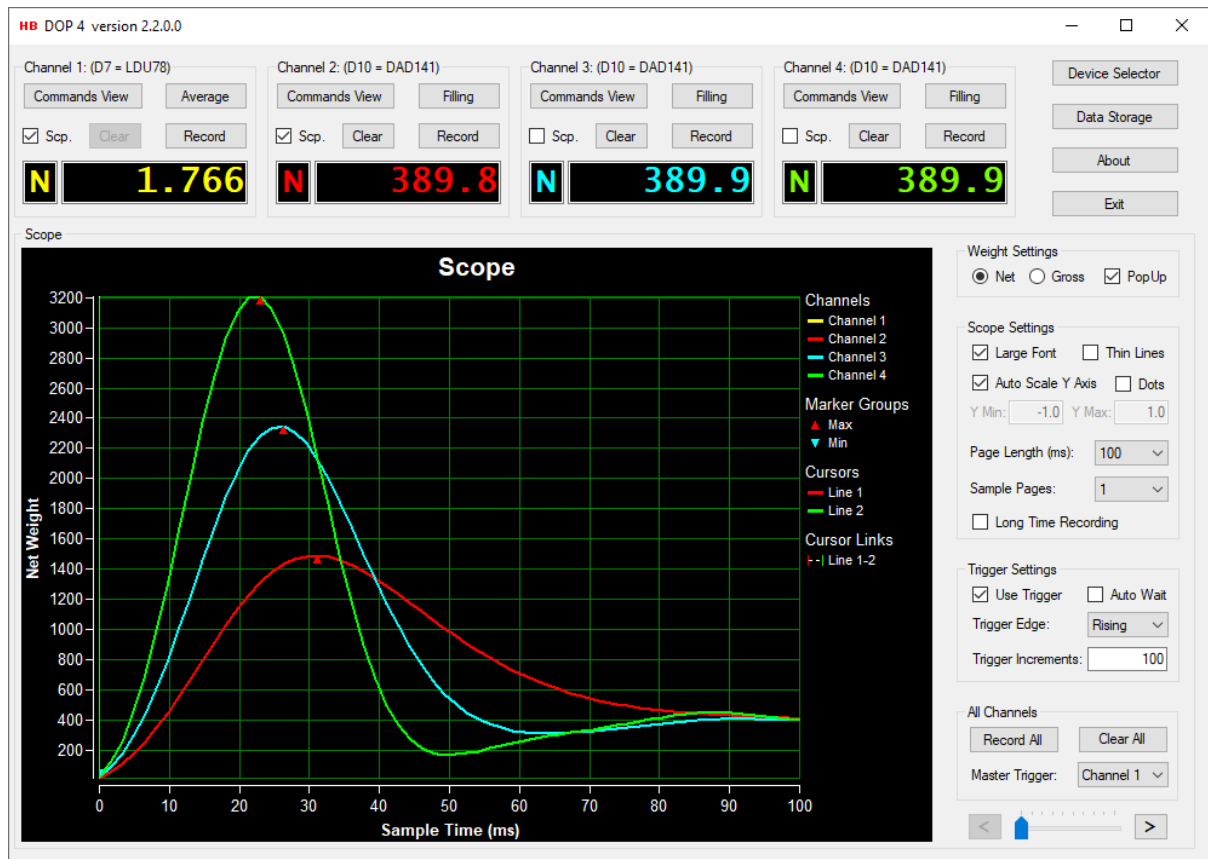
Selection of devices and channels is controlled from the "Device Selector" dialog, which must be selected as the first after DOP 4 application startup.

The "Device Selector" dialog can be accessed by selecting the "Device Selector" button.

The details around the "Device Selector" dialog are explained elsewhere in this document.



After one or more H&B devices have been assigned to one or more scope channels, recording and measurement of load cell data can be started, and scope recording results as showed in the picture below can be achieved.



From the picture above as an example, a recording for each of the channel 2, 3 and 4 has been done, indicated by the colors of the channel graphs on the scope display.

The Y Axis of the scope display is set to auto scale. In this case the scaling area is 100 to 2000.

The recording has been triggered at 100 increments by rising values as the "Wait for Trigger at Record" check box is checked and all the three recordings start at 100 increments.

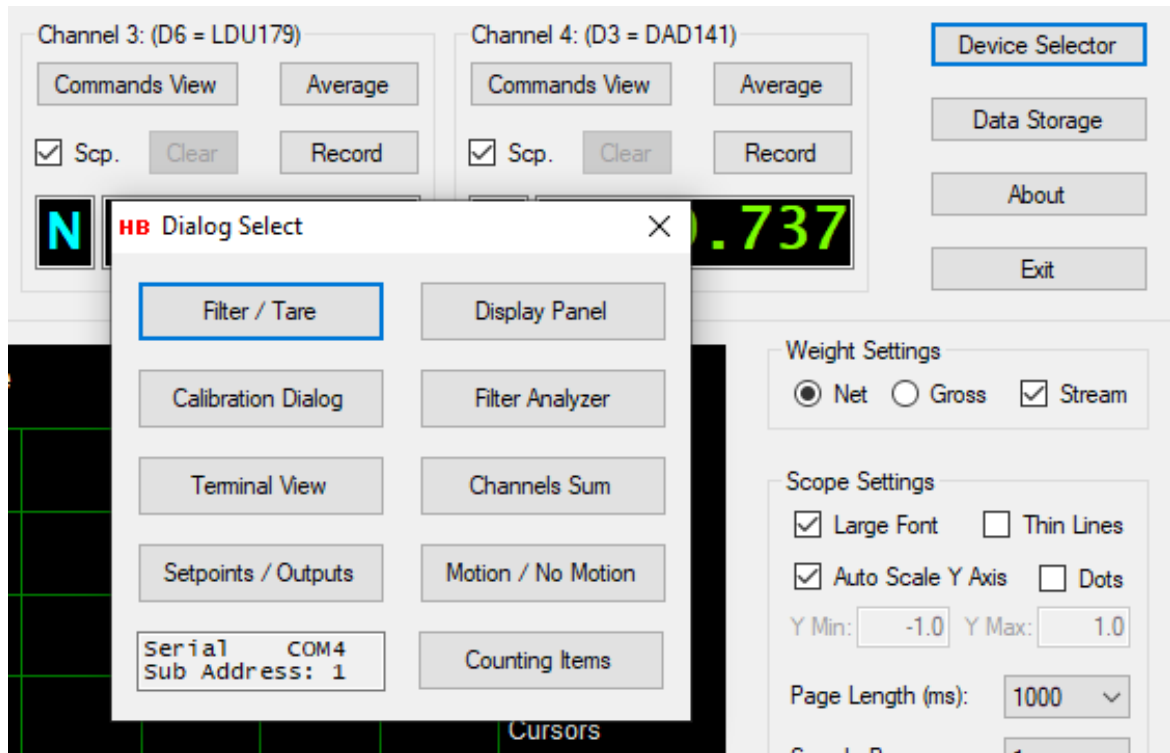
The page length time is currently set to 100 milliseconds, but it must have been higher at record time as the left scope sample page arrow is enabled, indicating that there are more scope pages available than the one showed in the scope display.

It's also indicated that we are looking at the first page as the left scope sample page arrow is disabled.

In the following sections, the functionality and use of all the different group boxes in the main window for recording of load cell data and the setup of these recordings will be explained.

## 20.1 Dialog shortcuts

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



### 20.1.1 Dialog Select

From the "Dialog Select" menu it's possible to access the most common dialogs of the DOP 4 application.

By selecting the "Filter / Tare" button, the "Filter / Tare" dialog for the device connected to the selected channel display will be opened.

By selecting the "Display Panel" button, the "Display Panel" dialog for the device connected to the selected channel display will be opened.

By selecting the "Calibration Dialog" button, the "Calibration Dialog" for the device connected to the selected channel display will be opened.

By selecting the "Filter Analyzer" button, the "Filter Analyzer" dialog for the device connected to the selected channel display will be opened. The "Filter Analyzer" dialog is only available for devices with Serial COM port, Serial LAN or CANopen interface.

By selecting the "Terminal View" button, the "Terminal View" dialog for the device connected to the selected channel display will be opened.

The "Terminal View" dialog is only available for Serial COM port, Serial LAN, Modbus and CANopen devices. So, for other communication interfaces the "Terminal View" button will be disabled.

By selecting the "Channels Sum" button, the "Channels Sum" dialog for all the devices currently connected will be opened.

By selecting the "Setpoints / Outputs" button, the "Setpoints / Outputs Measurement" dialog for the device connected to the selected channel display will be opened.

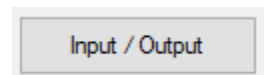
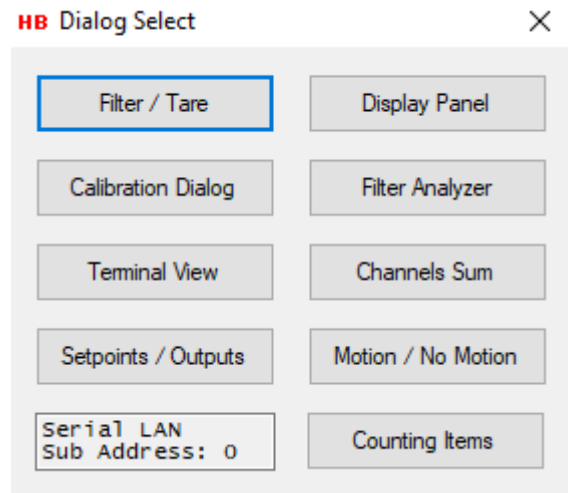
If the device is not connected using the Serial COM port or Serial LAN, the text "Input / Output" will appear on the button. Selecting the button will open the "Input / Output" dialog.

If setpoint commands are not supported for the connected device, the button will be disabled.

By selecting the "Motion / No Motion" button, the "Motion / No Motion" dialog for the device connected to the selected channel display will be opened.

The "Motion / No Motion" dialog is only available for devices with Serial COM port or Serial LAN interface.

By selecting the "Counting Items" button, the "Counting Items" dialog for the device connected to the selected channel display will be opened.



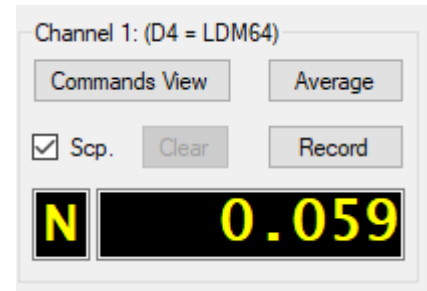
## 20.2 Channel group box

On the top of the main window the four "Channel" group boxes are located.

From the "Channel" group boxes, the load cell data recording and measurement for a given connected H&B device is controlled.

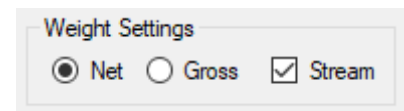
When an H&B device is connected to one of the four device channels by selection in the "Device Selector" dialog, the device is assigned to the "Channel" group box belonging to this channel.

The name of the H&B device under control will appear at the group box descriptor controlling the device.



### 20.2.1 The weight displays / settings

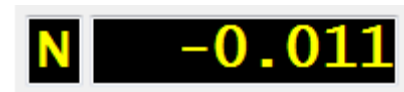
From the "Weight Settings" group box, it can be controlled if weight values are to be displayed as net or gross values by selecting the appropriate radio button.



From the "Weight Settings" group box it can also be controlled if weight data from the device should be streamed or polled.

Only devices using full duplex can stream data using the "Send Net" (SN) or a "Send Gross" (SG) command, so uncheck the "Stream" check box if you are using half duplex.

In the weight display window, the current load cell weight value is displayed as either a net or a gross value.



The type of weight value presented in the weight value display is indicated by a leading "N" for net or a "G" for gross value.

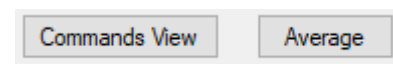


The selected net / gross setting is common for all the four channel displays.

### 20.2.2 The channel dialog buttons

By selecting the "Commands View" button, the "Commands View" for the H&B device connected to the specific "Channel" group box will be opened.

The "Commands View" dialog is explained in another section, so it will not be explained in this section.



If the H&B device connected to the specific "Channel" group box supports average, dosed or mass flow measurement the "Measure" button will be enabled with a text reflecting the measurement type.

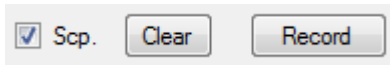
If the H&B device connected to the specific "Channel" group is loaded with "checkweigher" firmware, the "Average Measurement" dialog will be opened covering the H&B device connected to the current "Channel" group box.

If the H&B device is loaded with "Filler" firmware, the "Dosed Measurement" dialog will be opened covering the connected H&B device.

If the H&B device is loaded with "Mass Flow" firmware, the "Mass Flow Measurement" dialog will be opened covering the connected H&B device.

Both the "Average Measurement" dialog, the "Dosed Measurement" dialog and the "Mass Flow Measurement" dialog are described in detail elsewhere in this manual.

### 20.2.3 The recording buttons



By checking the "Scp." check box the H&B device assigned to the channel will be included in multi-channel recording. The "Scp." check box is by default checked at channel creation.

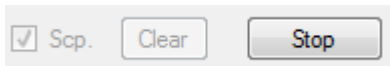
If the same H&B device is assigned to more than one channel, it's only possible to check one of the "Scp." check boxes. The rest will remain unchecked. Checking another "Scp." check box will uncheck the currently checked one.

The same goes for multiple devices with serial COM port interface or Serial LAN interface connected to the same COM port. Only one of these devices can one by one be selected by checking the "Scp." check box.

Selecting the "Clear" button will clear the recorded data (if any) on the scope display for the connected H&B device belonging to that channel.

By selecting the "Record" button in a given "Channel" group box, load cell data from the H&B device assigned to the channel, will be recorded to the scope display. The length of the recording depends on the scope page length and the number of scope pages selected in the "Scope Settings" group box. Read the "Scope Settings" section for more details.

The text of the "Record" button will change to "Stop" after selection.



If no trigger criteria are selected in the "Trigger Settings" group box, the recording for the H&B device assigned to the channel will start immediately and will last for the time period of the setup done in the "Scope Settings" group box.

For long time recordings the recording must be stopped manually by selecting the "Stop" button.

If trigger criteria are selected, the recording to the scope display will start when the weight value reach the increments level defined in the "Trigger Settings" group box. See the section covering "Trigger Settings" for more information.

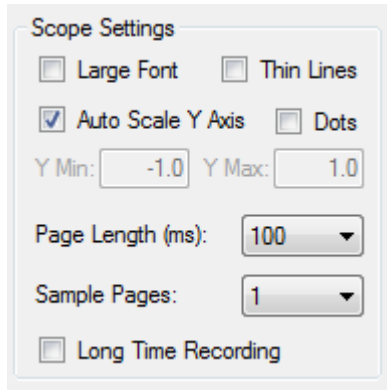
The increments value is the weight value to be reached without the decimal point. So, 0.200 and 2.00 equals both 200 increments.

The trigger levels can be reached by both positive and negative weight values.

The "Record" button is only enabled when the "Stream" check box inside the "Weight Settings" group box is checked.

## 20.3 Scope settings

The "Scope Settings" group box consists of several settings to adjust the behavior and appearance of the scope object.



### 20.3.1 Common settings

By checking the "Large Font" check box, the weight and time values on the scope will be displayed with a font size of 10. If unchecked the font size will be 8.

By checking the "Thin Lines" check box, the size of the recorded scope graph lines will be 1 pixel wide. If unchecked, it will be 2 pixels wide.

For "Page Lengths" larger than 10000 ms, it can be recommended to check the "Thin Lines" check box when browsing through the scope display pages, as it's more time-consuming to display thick lines than thin lines.

By checking the "Dots" check box, the graphs on the scope will be displayed as dots, on positions matching the time stamp for data received. This makes an easy way to measure the sample rate of the device, simply by counting dots on the screen. (You may have to set the page length to 100 ms).

By checking the "Auto Scale Y Axis" check box, the weight scale on the Y-Axis of the scope is calculated automatic. If unchecked, the "Y Max" and "Y Min" text fields are enabled, and the user can enter some fixed Y-Axis scale values at choice.

#### 20.3.1.1 Long time recording check box

Checking and un-checking the "Long Time Recording" check box, will make the "Page Length" drop box and the "Sample Pages" drop box change in format as can be seen in the sections covering the short and long-time recording setups.

By checking the "Long Time Recording" check box, the recording time pr scope page can be set by an interval from 60 seconds up to 150 hours pr. page, having an "unlimited" number of sample pages.

The behavior of long-time recording will be explained in detail later in this section.

Having the "Long Time Recording" check box unchecked, the recording time pr scope page can be set by an interval from 100 milliseconds up to 60 seconds having a maximum of 120 sample pages. The behavior of short time recording will be explained in detail later in this section.

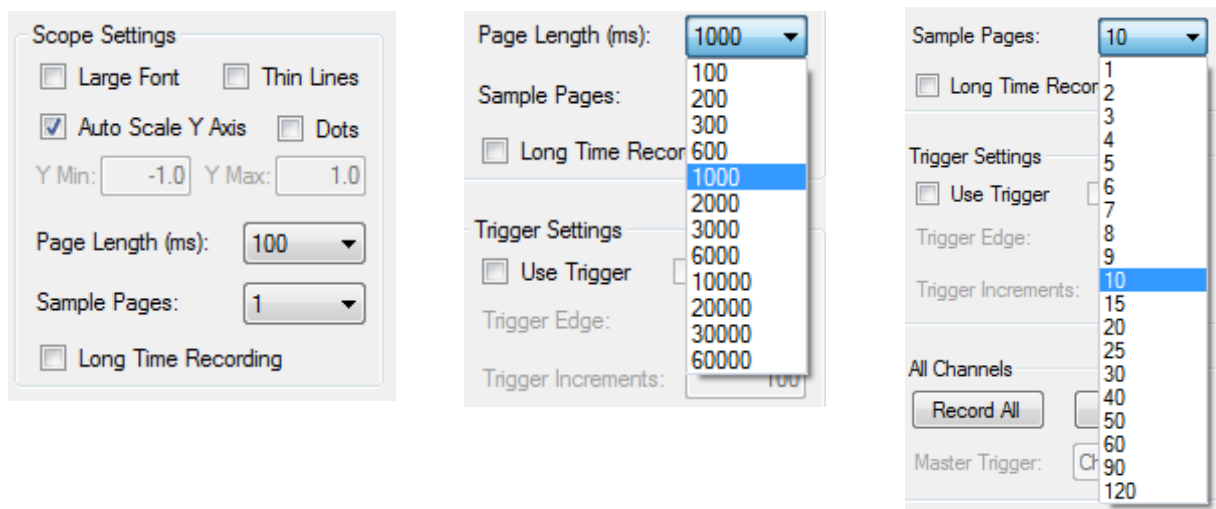
It's possible to have both short time and long-time record data at the same time. By toggling between check and uncheck of the "Long Time Recording" check box, the two different recordings can be investigated separately.

Both short-time and long-time recordings can be saved separately.

### 20.3.2 Short time recording setup (Streamed)

Having the "Long Time Recording" check box unchecked, the recording time pr scope page can be set by an interval from 100 milliseconds up to 60 seconds having a maximum of 120 sample pages.

The maximum short time recording time can this way be set to a maximum of 2 hours.



The page length of the scope display can be set by selecting one of the preset page length values from the "Page Length" drop down box. The values are expressed as milliseconds.

For "Page Lengths" larger than 10000 ms, it can be recommended to check the "Thin Lines" check box when browsing through the scope display pages, as it's more time-consuming to display thick lines than thin lines.

The number of pages pr. record can be set by selecting one of the preset numbers of page values from the "Sample Pages" drop down box.

The total record time is this way calculated by the scope page length times the number of sample pages.

Having the page length set to 1000 milliseconds and the number of pages to 10 will give a total record time of 10 seconds.

Using the scope sample page arrows as explained later, the user can walk backward and forward through the scope display sample pages.

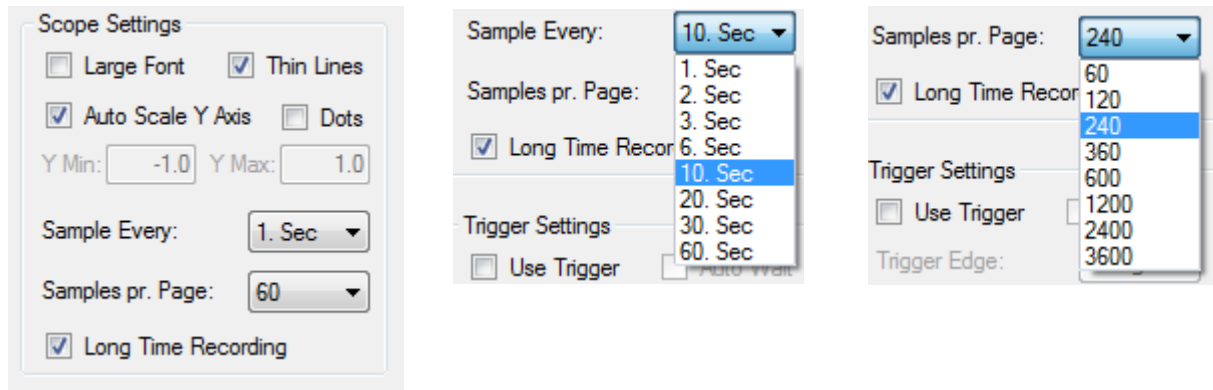


By in this case changing the page length after the recording is finished, from 1000 to 10000 milliseconds, the whole record session can be seen on one scope page.

Changing, in this case, the page length from 1000 to 100 milliseconds after the recording is finished, the total recording will last 100 pages. The data on the scope display can then be examined more detailed, again by walking forward and backward through the scope display pages using the sample page arrows.

### 20.3.3 Long time recording setup (Polled)

By checking the "Long Time Recording" check box, the recording time pr scope page can be set by an interval of 60 seconds to 150 hours pr. page, having an "unlimited" number of sample pages.



The sample interval of a given record session can be set by selecting one of the preset sample interval values from the "Sample Every" drop down box.

The number of samples pr scope display page can be set by selecting one of the preset samples pr. page values from the "Samples pr Page" drop down box.

The total record time pr. scope display page is this way calculated by the sample interval times the number of samples pr. page.

Having for instance the sample interval set to one sample pr 10 seconds and having the samples pr. page set to 1200 samples pr. page will give a total record time of 200 minutes pr page.

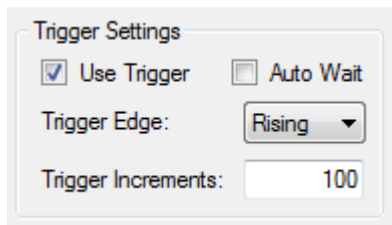
Using the sample page arrows as explained later, the user can walk backward and forward through the scope display sample pages after the recording has been stopped.



The detail level of the recorded load cell data on the scope display can after the recording be changed by changing the values of the "Sample Every" and the "Samples pr. Page" drop down boxes.

## 20.4 Trigger Settings

In the "Trigger Settings" group box, the set up for waiting for a specific trigger level to be reached before a scheduled recoding should start can be set.



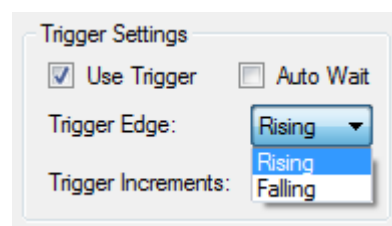
By checking the "Use Trigger" check box, a scheduled recording ("Record" button selected) will not start the actual recording to the scope display before the increments value of the "Trigger Increments" text field is reached by increasing or decreasing the weight on the scale.

The increments value is the weight value to be reached without the decimal point. So, 0.200 and 2.00 equals both 200 increments.

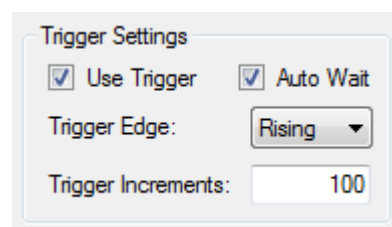
Both positive and negative integer values can be entered to the "Trigger Increments" field.

By selecting "Rising" from the "Trigger Edge" drop down box, the recording will start when the increments value is reached from a value lower than the increments value.

By selecting "Falling" from the "Trigger Edge" drop down box, the recording will start when the increments value is reached from a value higher than the increments value.



By checking the "Auto Wait" check box, the state of the main window will remain in the record mode state and will after ending a recording session, wait until the level of the load cell weight returns to below or above the trigger level depending on the trigger edge value and wait for a new trigger level to be reached.



When the trigger increments level has been reached again, the display will be cleared, and a new record session will start.

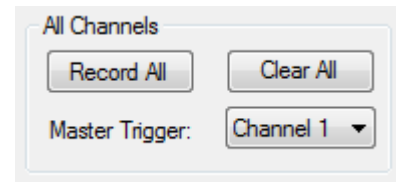
When in this record mode the record state must be stopped manually by selecting the "Stop" record button as the record state will keep on looping when in this "Auto Wait" state.

## 20.5 All Channels

From the "All Channels" group box, multi-channel recording and multi-channel scope display clearing can be selected.

Selecting the "Clear All" button, the scope display recordings (if any) will for all channels be cleared.

Selecting the "Record All" button will start a multi-channel recording. Only load cell data from different devices and only one device pr. COM port will be recorded. See the "Channels" group box section for more details on the "Scp." check box.

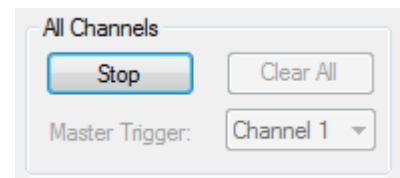


From the "Master Trigger:" drop down box, the trigger channel (if any) for the current recording can be selected. When the trigger level is reached for the selected channel, the actual recording will start.

To be able to select the master trigger channel for the recording, the "Use Trigger" check box in the "Trigger Settings" group box must be checked. Refer to the section describing the "Trigger Settings" group box for more information.

After the "Record All" button has been selected, the text of the button will change to "Stop"

Selecting the "Stop" button the currently ongoing recording will be stopped.



## 20.6 Example of a scope data recording

In this section we will show how to do a simple triggered scope display recording from an H&B device over two scope display pages.

Assign an H&B device to channel 1.

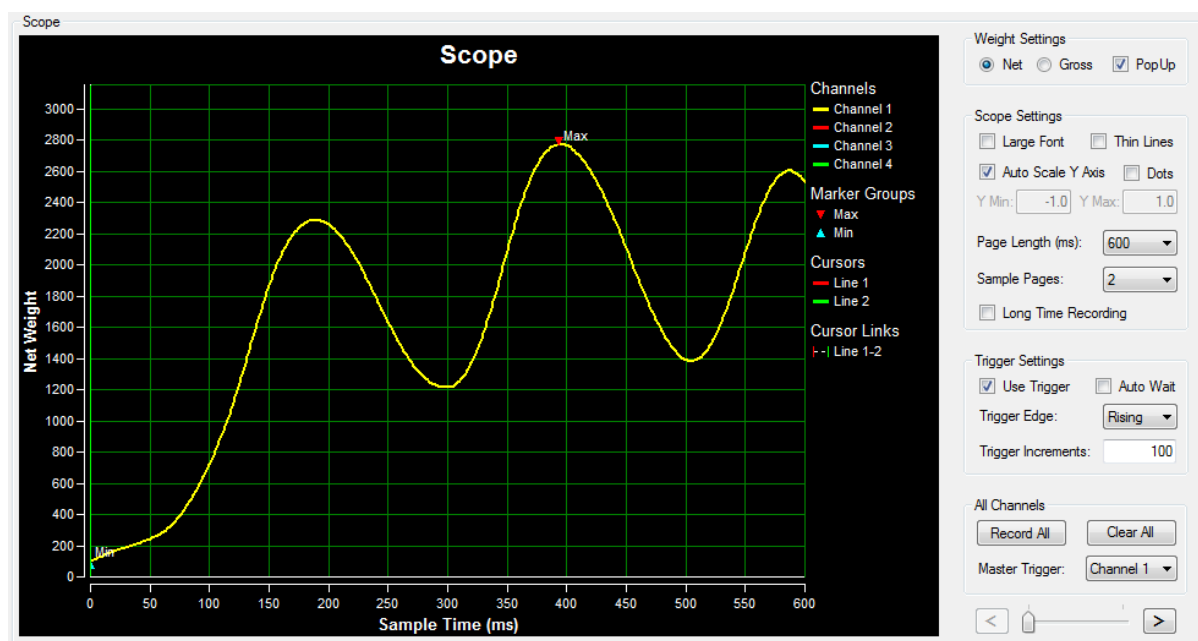
In the "Scope Settings" group box, set the page length to 600 milliseconds and the sample pages to 2.

In the "Trigger Settings" group box check the "Wait for Trigger at Record" check box and set the "Trigger Increments" to 100. Let the "Trigger Edge" stay at "Rising".

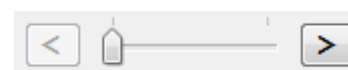
In the "Channel 1" group box select the "Record" button. Put some load on the scale, for instance by using your hand and the record will start when 100 increments are reached.

After 1200 milliseconds, the record will stop, now filling two scope display pages each having a size of 600 milliseconds.

After the recording stops, page one of the recordings will be displayed on the scope display.



Select the right scope sample page arrow to examine page two of the recording.

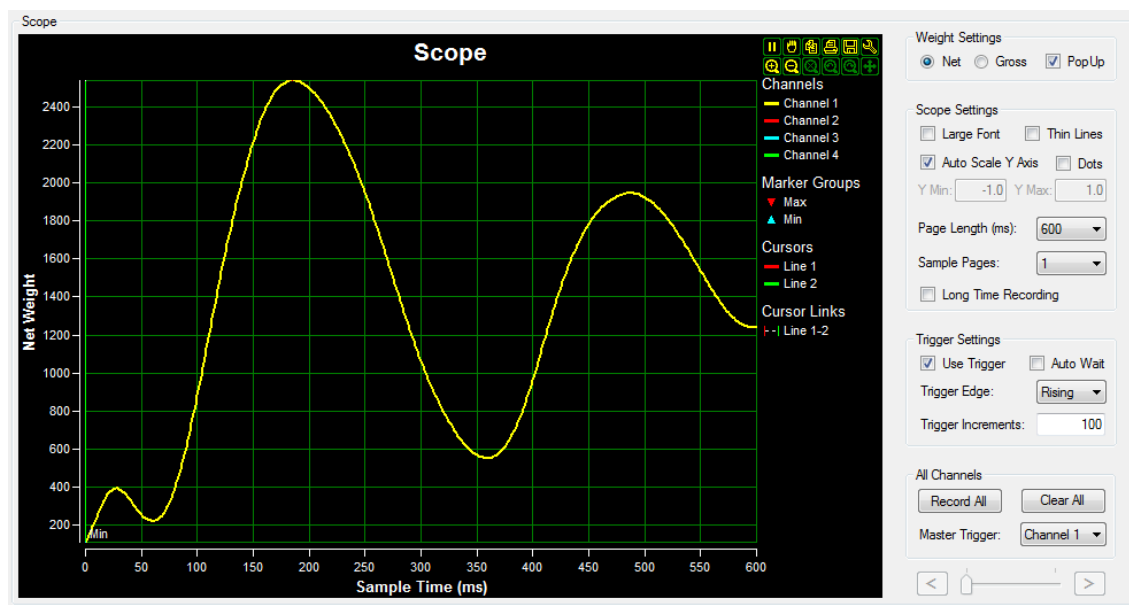


## 20.7 Using the scope sample page arrows

Use of the scope sample page arrows will be explained by using an example.

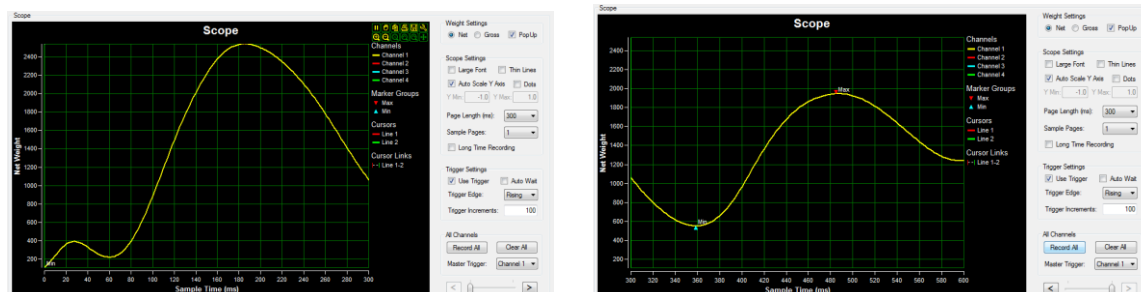
Assume we have a single page 600 ms short time record as showed in the picture below.

Page Length (ms): **600**



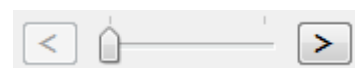
Change the "Page Length" value from 600 to 300 milliseconds.

Page Length (ms): **300**



As seen from the first picture above now the first half (0 to 300 ms) of the original recording can be seen on the scope display.

Now by selecting the right arrow, the last half (300 to 600 ms) of the original recording can be seen on the scope display.



By selecting the left scope sample page arrow, the first part of the recording can be seen again.

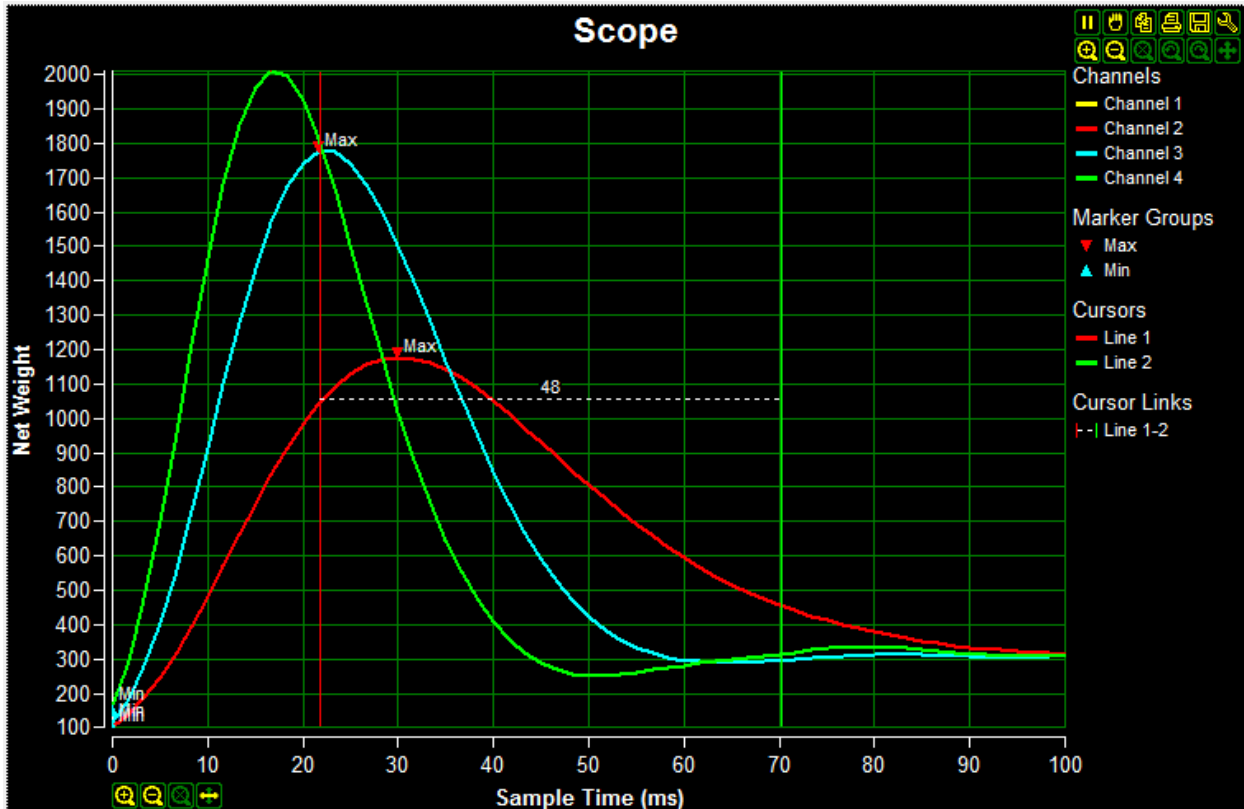
By changing the "Page Length" value to 100 milliseconds, the original scope recording will be divided into 6 separate and more detailed sample pages. The 6 sample pages can be walked through by using the scope sample page arrows.



## 20.8 Scope display Functions

This section will describe some of the possibilities for manipulating the appearance of the data on scope display and the tools for the scope display itself.

### 20.8.1 Scope cursors and cursor link



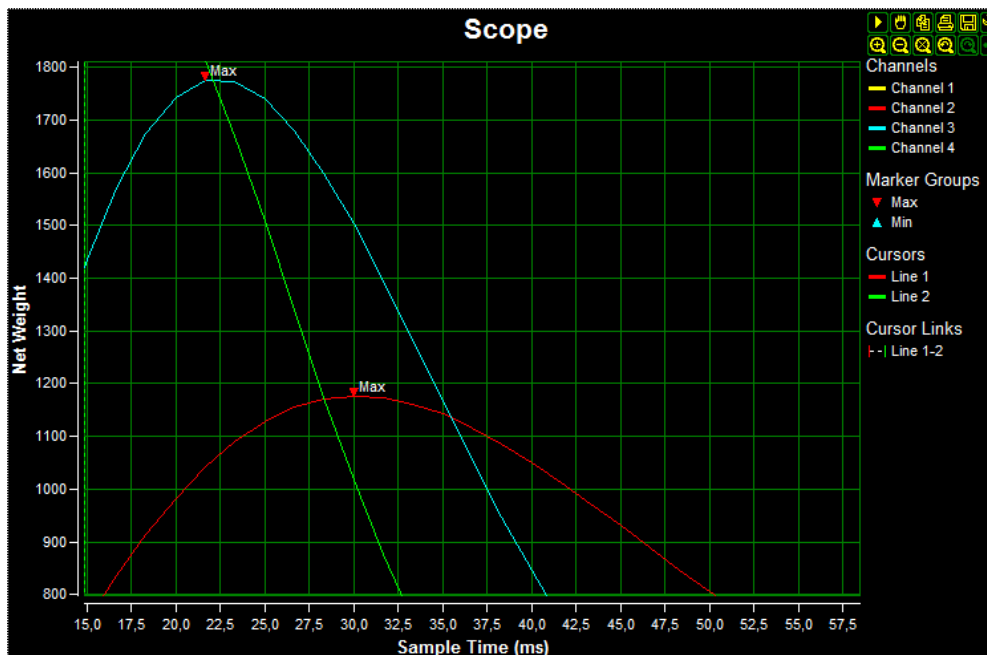
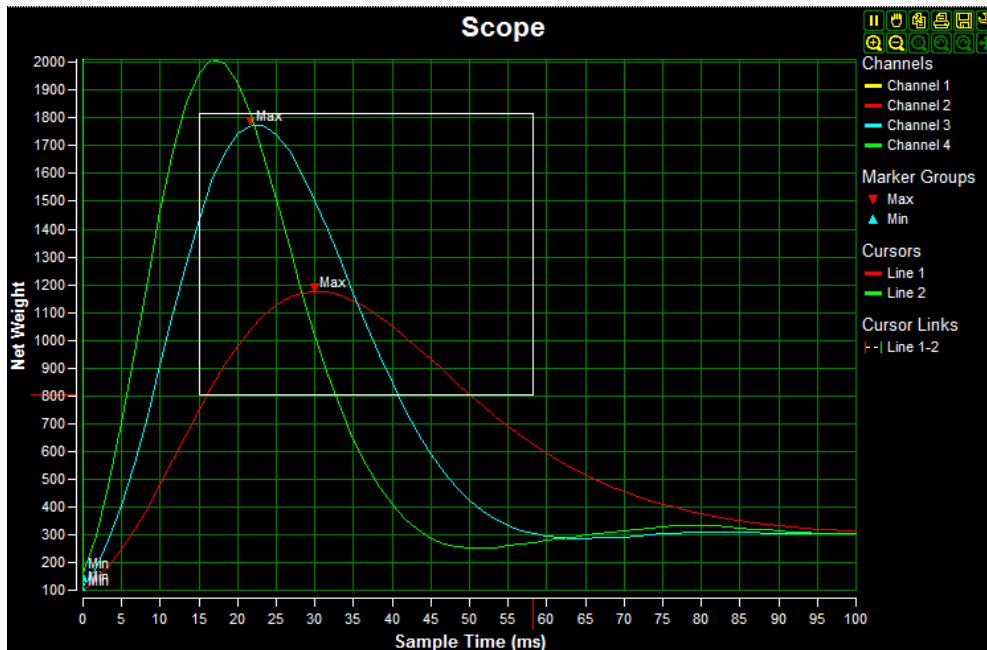
By default, two cursor lines "Line 1" and "Line 2" are located on the left side of the scope display. A red cursor line named "Line 1" and a green cursor line named "Line 2".

The green cursor line "Line 2" can by default be seen on the left side of the scope display.

By using the mouse, these cursor lines can be selected and moved around at the scope display. The cursor lines can be used for measuring time distances between different points on the scope display.



The difference in time between the two cursor lines "Line 1" and "Line 2" can be inspected by the value of the cursor link named "Line 1-2".

### 20.8.2 Scope display zooming



By using the mouse cursor to select areas on the scope display, an area of the scope display can be zoomed for further inspections, as showed on the pictures above.

Simply left click the mouse having its cursor on the specific area of the scope display. Hold down the left mouse button and draw the mouse cursor over the area to be inspected. Release the left mouse button and the area will be zoomed, filling the whole scope display area.

Click on the  symbol to zoom or the  symbol to undo zooming.

### 20.8.3 Other scope display functions

By moving the mouse cursor into the scope display area, a main group of icons will appear in the right upper corner of the scope display.



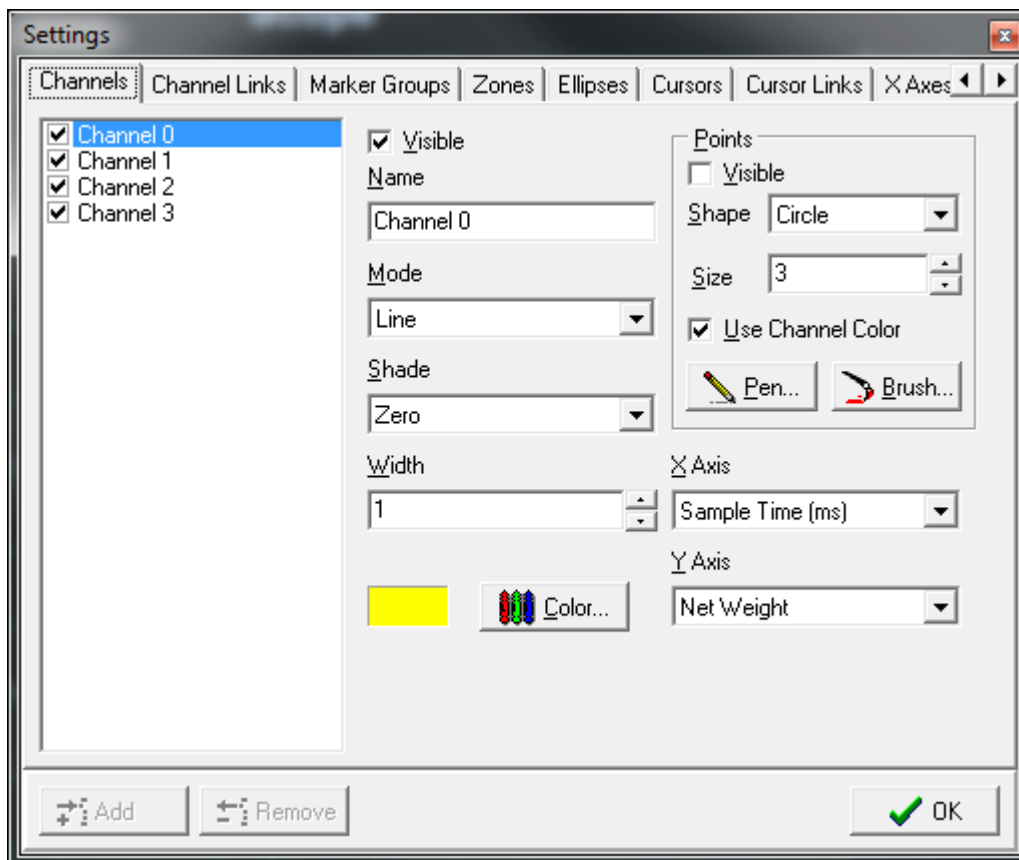
In this section the functionality of these icons will briefly be explained.

There are other icon groups to be found around the X and Y axis of the scope display. These icon groups are similar to the main icon group and will not be covered in this section.

#### 20.8.3.1 The scope display tool icon



By clicking on the "Tool" icon, the special "Settings" dialog for the scope display will be opened. In this advanced scope settings dialog, several scope display parameters can be set. Explaining the functionality covered in this dialog is out of scope for this document.



**20.8.3.2 The save scope display picture icon**

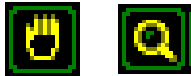
By clicking on the "Save" icon, the current scope display can be saved to a disk file.

**20.8.3.3 The print scope display icon**

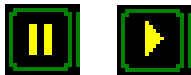
By clicking on the "Print" icon, the current scope display can be sent to a printer.

**20.8.3.4 The copy scope display icon**

By clicking on the "Copy" icon, the current scope display can be copied to memory and pasted into for instance a Word document.

**20.8.3.5 The hand / zoom icon**

By clicking on the "Hand" icon, the current zoomed scope display can be moved around using the mouse. The icon will change to the "zoom" icon. Click on this icon to return to the zoom mode.

**20.8.3.6 The pause / play icon**

By clicking on the "Pause" icon, the current recording will be paused, and the icon will be changed to the "Play" icon. Clicking on the "Play" icon the display of the recording will continue.

**20.8.3.7 The zooming scope display icons**

By clicking on one of the "Zooming" icons, the current scope display can be zoomed in or out.

**20.8.3.8 The undo scope display icons**

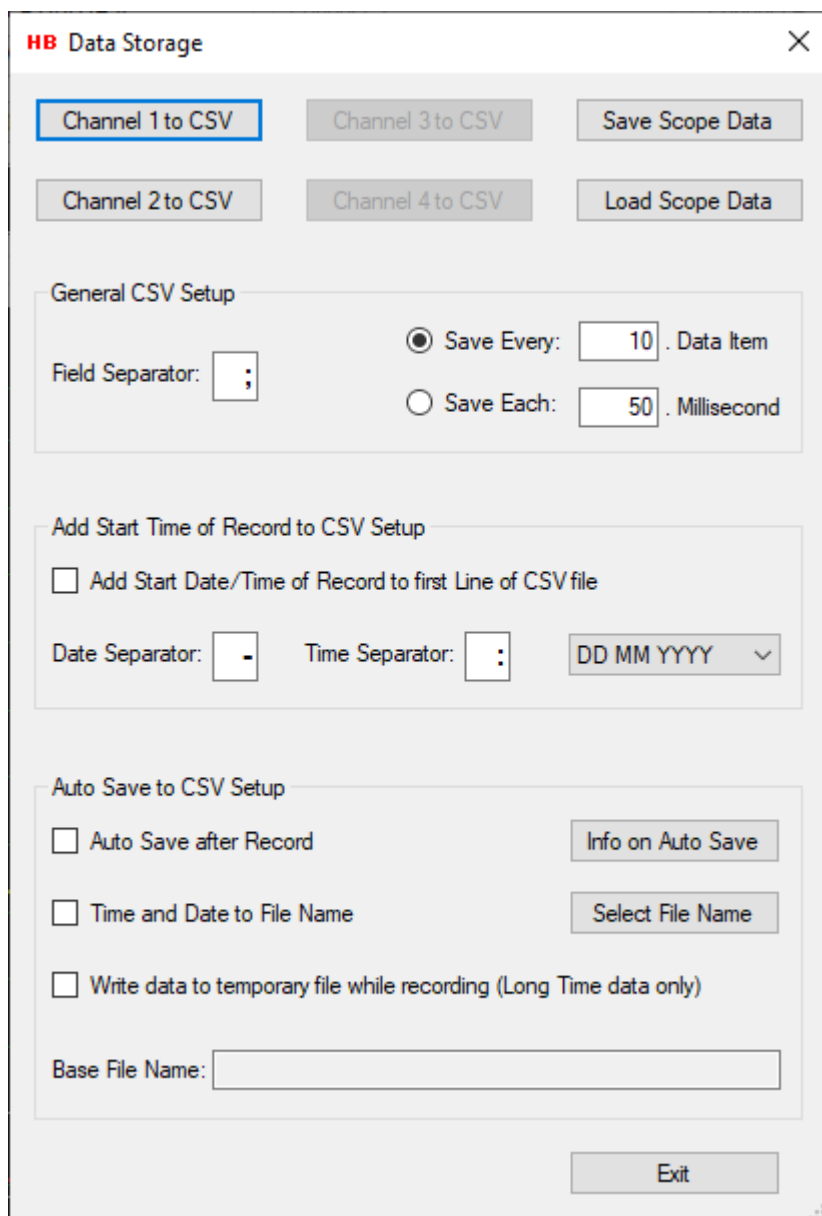
By clicking on one of the "Undo" icons, the previously scope display action will be undone.

## 21 Data Storage (Main Window)

In the "Data Storage" dialog, accessible from the main window the user can save recorded scope display data from all the active scope channels to a disk file.

Recorded scope data can be saved as textual CSV data to be viewed using for instance a Microsoft Excel application.

Data can also be saved as raw scope recording data having all the recorded channels in one file. The stored scope data can then later be reloaded back to the scope display.



The "HB Data Storage" dialog box contains the following elements:

- Buttons:** "Channel 1 to CSV", "Channel 2 to CSV", "Channel 3 to CSV", "Channel 4 to CSV", "Save Scope Data", "Load Scope Data", and "Exit".
- General CSV Setup:**
  - Field Separator:
  - ☒ Save Every:  . Data Item
  - ☐ Save Each:  . Millisecond
- Add Start Time of Record to CSV Setup:**
  - ☐ Add Start Date/Time of Record to first Line of CSV file
  - Date Separator:  Time Separator:
- Auto Save to CSV Setup:**
  - ☐ Auto Save after Record (Info on Auto Save)
  - ☐ Time and Date to File Name (Select File Name)
  - ☐ Write data to temporary file while recording (Long Time data only)
  - Base File Name:

The "Data Storage" dialog can be accessed from the main window by selecting the "Data Storage" button.

## 21.1 Save scope display data as CSV text files

Recorded scope display data can be saved channel by channel as a CSV (Comma Separated Values) text files, which can be loaded into for instance a Microsoft Excel application for further investigation.

By selecting one of the "Channel x to CSV" buttons, the scope display data for that specific channel, will be saved as a CSV file. A "Save File" dialog will appear, and a proper file name can be selected for the CSV file.

Scope display data saved as CSV files are saved with the extension .csv.

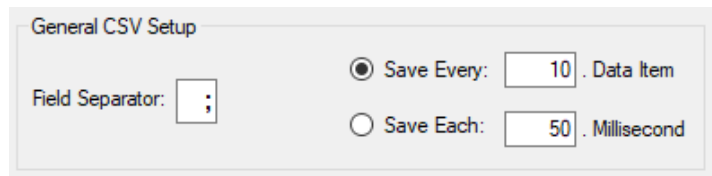
Only the "Channel x to CSV" buttons where the channel they represent having recorded data on the scope display will be enabled.

The CSV data is saved as two columns with the scale weight in the first column and the recorded time in milliseconds in the second column.

	A	B
1	100	0
2	100	1,640689
3	100	3,281378
4	100	4,922067
5	100	6,562757
6	100	8,203445
7	100	9,844134
8	100	11,48482
9	101	13,12551
10	101	14,7662
11	101	16,40689
12	101	18,04758

### 21.1.1 General CSV Setup

In the text field "Field Separator" the CSV field separator can be specified. By default, the separator character will be the separator character for the current country language used by the PC.



General CSV Setup

Field Separator: ;

☒ Save Every: 10 . Data Item  
☐ Save Each: 50 . Millisecond

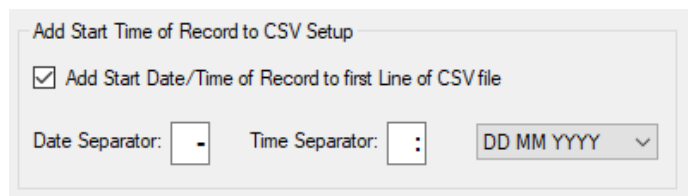
A limitation of the CSV data amount to be saved can be set in the text field "Save Every x. Data Item". If the value of the text field for instance is set to 100, only 1 out of 100 data items will be saved. One data item is saved, and the next 99 data items are skipped and so on. Set the value to 1 if all items should be saved.

A time limit can also be defined so only data matching the defined data interval (equal or nearest higher) will be saved. If "Save Each" is set to 50 milliseconds, data with the time interval of 50 milliseconds (0, 50, 100, 150 ...) will be saved.

### 21.1.2 Add record start time to CSV file

By checking the check box "Add Start Date/Time of Record to first Line of CSV file", the scope record date/time will be added to the first line of the CSV file.

In the text fields "Date Separator" and "Time Separator" the CSV field separators can be specified. By default, the separator characters will be the separator characters for the current country language used by the PC. The order of day, month and year can be defined by the "DD MM YYYY" drop down box.



Add Start Time of Record to CSV Setup

☒ Add Start Date/Time of Record to first Line of CSV file

Date Separator: - Time Separator: : DD MM YYYY

The figure shows an example of start date/time of record added to the first line of a CSV file loaded into Microsoft Excel.

	A	B	C	D
1	100	0	21-03-2022	10:48:08
2	100	1,640689		
3	100	3,281378		
4	100	4,922067		
5	100	6,562757		

### 21.1.3 Auto Save to CSV Setup

In the group box "Auto Save to CSV Setup" it can be generally defined if recorded scope data automatically should be saved to CSV files at the end of each scope data recording. By defining a base file name and checking the "Auto Save after Record" checkbox, recorded scope data will be stored to disk files at the end of each data recording.

A base file name can be defined by selecting the "Select File Name" button.

When the "Auto Save after Record" checkbox is checked, recorded scope data will be saved to the selected file name after the end of each scope data recording. Data will also be saved when using "Auto Wait".

The channel number '\_CHx' of the recorded data channel, will be added to the selected base file name. Also, the date and time will be added to the base file name if the "Time and Date to File Name" checkbox is checked.

If multi-channel recording is performed, the recorded data will be stored to separate files each containing data for a specific channel number.

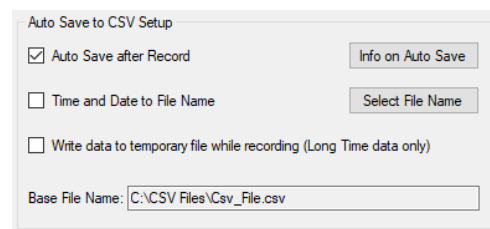
If the file name already exists when saving the data, existing data in the file will be overwritten.

By checking the "Write data to temporary file while recording (Long Time data only)" check box, recorded data will be stored ongoing while the record of long time data is performed. This way data is safe even if a power failure should occur. Temporary files are deleted when recording is stopped.

Examples:

Using the setup as shown in the figure to the right, recorded data from channel 1 will be saved as:

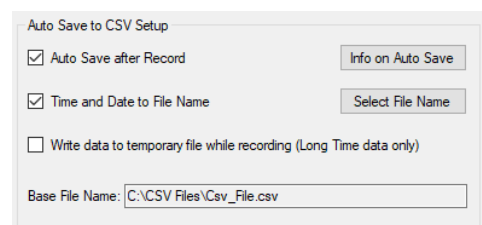
C:\CSV Files\CSV\_File\_CH1.csv



Using the setup as shown in the figure to the right, recorded data from channel 1 will be saved as:

C:\CSV Files\CSV\_File\_CH1\_2016-04-12\_10-34-21.csv

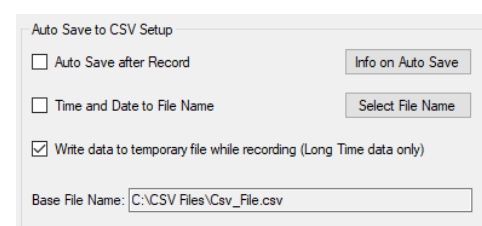
when saved at the time showed in the file name.



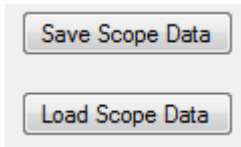
Using the setup as shown in the figure to the right, temporary recorded long time data from channel 1 will be saved as:

C:\CSV Files\CSV\_File\_CH1\_TEMP.csv

As can be seen from the figure, it is not necessary to have auto save activated for storing temporary long time data files. Just the name has to be defined.



## 21.2 Save / load scope display data as binary



### 21.2.1 Save scope display data

All the recorded scope display data can be saved at once as a binary file by selecting the "Save Scope Data" button. The saved scope display data can then later be reloaded into the scope object in the main window of the DOP 4 application, for further investigation.

By selecting the "Save Scope Data" button, the binary scope data currently appearing on the scope display with all the recorded data values, will be saved as a binary file. A "Save File" dialog will appear, and a proper file name can be selected for the binary scope data file.

The scope display data will be saved with the extension .rsd (Recorded Stream Data) if the check box "Long Time Recording" is not checked. Otherwise, the scope display data will be saved with the extension .rld (Recorded Long time Data)

### 21.2.2 Load scope display data

Previously saved recorded scope display data can be reloaded by selecting the "Load Scope Data" button.

By selecting the "Load Scope Data" button a "Load File" menu will appear.

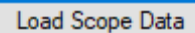
By selecting a file with the extension .rsd (Recorded Stream Data) the scope object will be loaded with recorded stream data for one or more data channels and the "Long Time Recording" check box will be unchecked.

By selecting a file with the extension .rld (Recorded Long time Data) the scope object will be loaded with recorded long time data for one or more data channels and the "Long Time Recording" check box will be checked.

The loaded scope display data can later again be saved as CSV data if wanted.

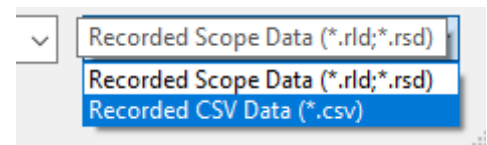
## 21.3 Load scope display data from CSV file

Previously saved recorded scope display data can be reloaded from a CSV file by selecting the "Load Scope Data" button.



Select the "Load Scope Data" button and a "Load File" menu will appear.

In the bottom right corner of the opened file dialog do select "Recorded CSV Data (\*.csv)" as file type.



By selecting a file with the extension ".csv" the "Select Scope Channel for Data" will appear.

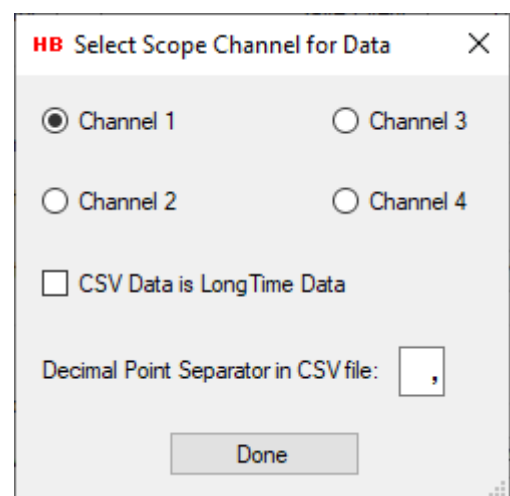
Select the scope display data channel to which the loaded data from the CSV file should be shown as this information is not stored in the CSV file.

Also define if the stored data is "Long Time" data as this information too are not stored in the CSV file.

The "CSV Data is Long Time" field will by default be set to the same as set in the main menu.

Define the decimal point separator as it appears in the CSV file so it can be found by the converter algorithm.

The CSV file field separator will be the same as defined in the "Data Storage" dialog.



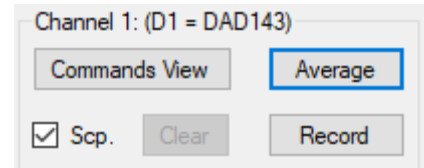
Select the "Done" button and the data will be loaded into the selected scope display channel.

It is in general recommended that scope display data are stored and loaded using the binary storing method, if possible, as all channels and recording type (Streamed data vs. long time data) are stored together in one file when stored as binary. Refer to the previous section for more information.

For CSV files however, only one scope display channel is stored for each file, so the individual channels have to be loaded one by one from individual files.

## 22 Average Measurement

If a given H&B device supports average measurement (Checkweigher), the “Average” button for the channel group box in the main window, covering that device will be enabled and detailed average measurements can be obtained by selecting the “Average” button.



By selecting the “Average” button for a checkweigher device the “Average Measurement” dialog appears.

### 22.1 Weight value displays

In the top left corner of the dialog there are two value displays located. The first one shows the net weight values by polling the “Get Net” (GN) command and the second one shows the latest average values by polling the “Get Average” (GA) command.



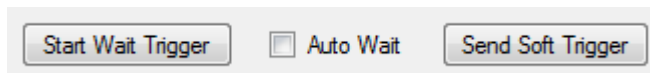
The “Filter / Tare” dialog for the current device can be accessed by clicking on the net weight display.

## 22.2 Trigger buttons

When selecting the "Start Wait Trigger" button, an average measurement recording will start when a trigger signal is received.

If the "Auto Wait" checkbox is checked, the dialog will automatically wait for a new trigger when the record is done. This way the measurement can be started away from the PC, without having to select the "Start Wait Trigger" button".

See the "Start wait trigger" section on information on average measurement by triggering.



When selecting the "Send Soft Trigger" button, a soft trigger command (TR) will be sent to the device and the average measurement recording will start immediately.

## 22.3 Scope settings

The "Scope Settings" group box consists of several settings to adjust the behavior and appearance of the scope object.

By checking the "Large Scale Font" check box, the weight and time values on the scope display will be displayed with a font size of 10. If unchecked the font size will be 8.

By checking the "Thin Line" check box, the size of the recorded scope graph lines will be 1 pixel wide. If unchecked, it will be 2 pixels wide.

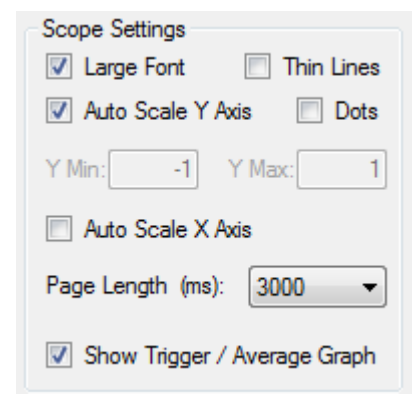
It's recommended to check the "Thin Line" check box when browsing through large scope display pages, as it's more time-consuming to display thick lines than thin lines. (Most commonly when using the main page scope display).

By checking the "Dots" check box, the graph on the scope display will be displayed as dots, on positions matching the time stamp for the data received. This makes an easy way to measure the sample rate of the device, simply by counting dots on the screen. (You may have to set the page length to 100 ms).

By checking the "Auto Scale Y Axis" check box, the weight scale on the Y-Axis of the scope display is calculated automatic. If unchecked, the "Y Max" and "Y Min" text fields are enabled, and the user can enter some fixed Y-Axis scale values at choice.

By checking the "Auto Scale X Axis" check box, the timeline of the X-Axis is calculated by adding the values of the "Start Delay" (SD) and the "Measure Time" (MT) command parameters + 10 %. If unchecked, the "X Axis" drop down box is enabled for the user to make a time value choice from the drop-down value list.

By checking the "Show Trigger / Average Graph" check box, the measured trigger and average values can be shown as two graphs together with the recorded net weight values. This can be used if more than one average measurement has been triggered during a recording. By unchecking the "Show Trigger / Average Graph" check box, only the recorded net weight graph together with the last measurement cursor lines will be shown on the scope as in earlier versions of the DOP 4 application.



## 22.4 Average Calculator

By selecting the "Calculate Average" button, the "Average Calculator" dialog will be opened.

The "Average Calculator" will ongoing calculate the average value of all the recorded weight values between the red "Start Measure" cursor line and the green "End Measure" cursor line.

The two cursor lines must both be present before the button is enabled.

The average of the graph's values between the cursor lines will be updated every time one of the cursors is moved or a new average record is done.

So, by moving around the cursors using the mouse, it is possible to ongoing calculate the average of the Net Weight graph values on different areas of the scope window.

The number of samples found between the cursor lines are also showed in the table.

From the positions of the cursor lines, the start delay time and the measure time is ongoing updated and showed in the "Start Delay Time" and the "Measure Time" fields.

Average Calculator

**HB Average Calculator**
✕

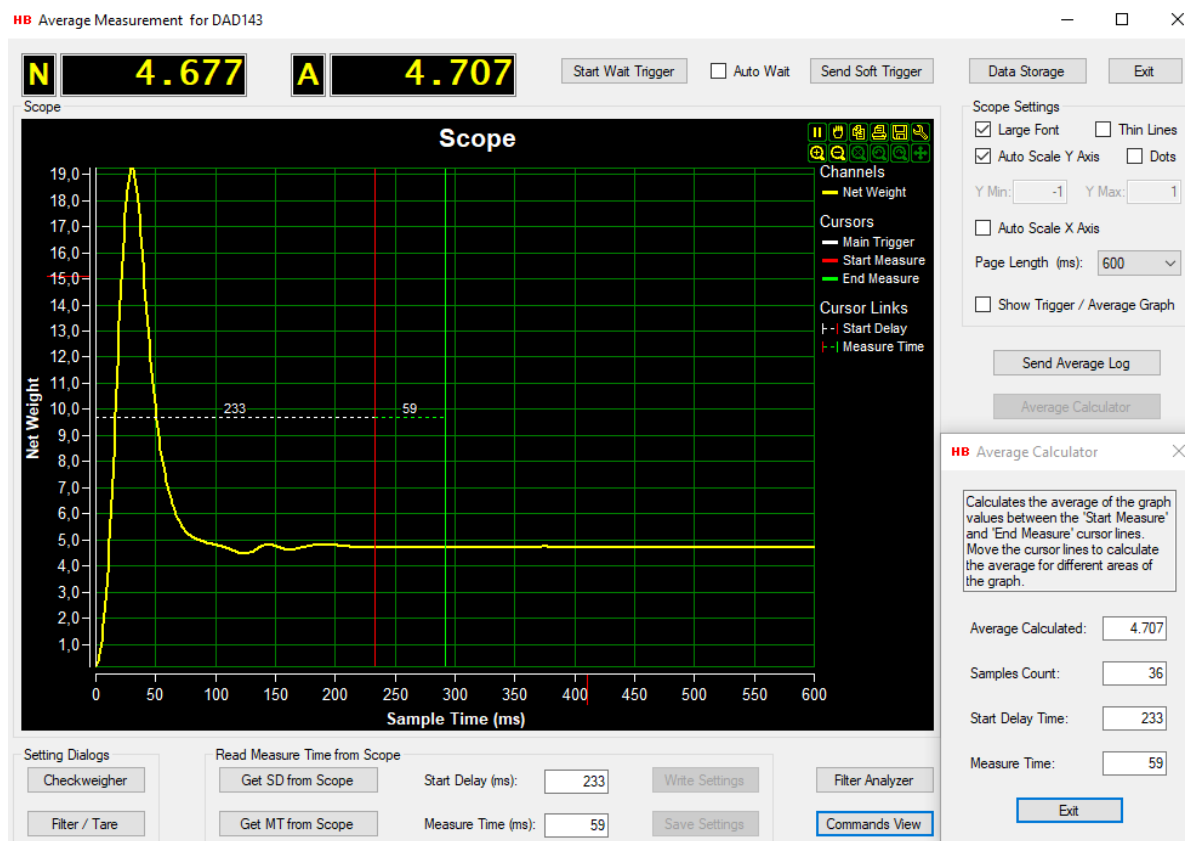
Calculates the average of the graph values between the 'Start Measure' and 'End Measure' cursor lines. Move the cursor lines to calculate the average for different areas of the graph.

Average Calculated:

Samples Count:

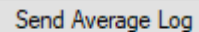
Start Delay Time:

Measure Time:



## 22.5 Send Average log

By selecting the "Send Average button" the "Send Average Log" dialog will be opened.



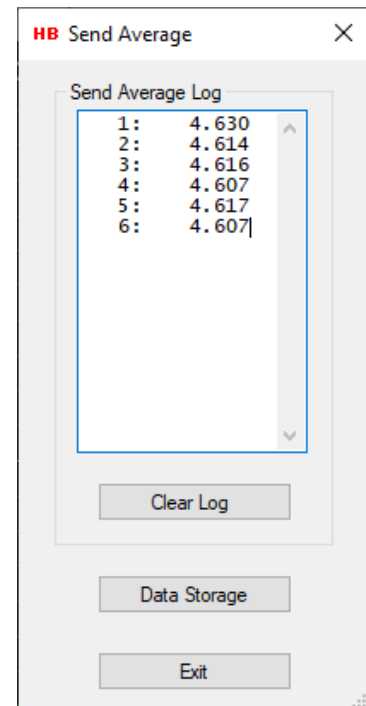
When the "Send Average Log" dialog is opened a "SA - Send Average" command will be sent to the selected device. The device is now set in stream average data mode waiting for average values to appear.

All received average values will be displayed in the "Send Average Log" group box.

Selecting the "Clear Log" button will clear the content of the "Send Average Log" text box.

The collected average values in the "Send Average Log" text box can be stored in a CSV file by selecting the "Data Storage" button. Read a more detailed description in the "Data Storage" section of this chapter.

The "Send Average" dialog will be closed by selecting the "Exit" button and the send average streaming will be stopped.



## 22.6 Recorded / Get Average log

The "Get Average Log" group box contains information about the status of logging average measurements.

By checking the "Auto Log When Changed" check box, the polled "Get Average" (GA) will be displayed in the "Average Log" text box one by one every time the "Get Average" values change.

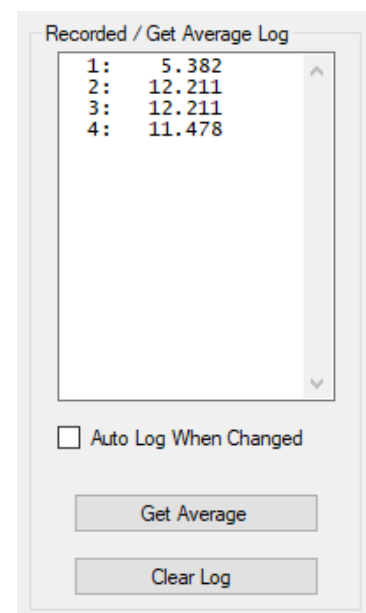
The average values will only be logged if the polled value is different than the previously collected value.

If all triggered average values are to be seen, then select the more precisely "Send Average Log" dialog.

Average values triggered during a recording will also be shown in the log window.

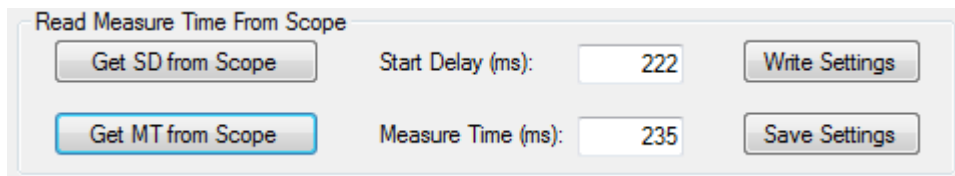
If "Log When Changed" check box is unchecked, the "Get Average" button will be enabled, and the average values will only be logged when the "Get Average" button is selected and during recording.

Selecting the "Clear Log" button will clear the content of the "Get Average Log" text box.



## 22.7 Read measure time from scope

From the "Read Measure Time from Scope" group box, the user can quickly set the values for "Start Delay" (SD) and "Measure Time" (MT)



### 22.7.1 Get SD and MT from scope

By selecting the buttons "Get SD from Scope" and / or "Get MT from Scope" the "Start Delay" and the "Measure Time" parameters can be read from the scope cursor links "Start Delay" and / or "Measure time" on the scope display if any, as explained in later section.

The values of the scope cursor links, will be copied into the "Start Delay" and the "Measure Time" text fields and can then be written or saved as explained later.

The values of the "Start Delay" and the "Measure Time" text fields can also be changed manually by entering the values by hand.

### 22.7.2 Write settings

By selecting the "Write Settings" button, the changed checkweigher parameter 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 device.

### 22.7.3 Save settings

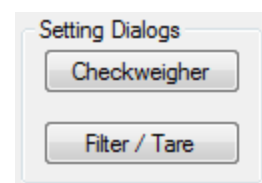
If the changed checkweigher parameter values are to be used after device power down/up, it's necessary to save the settings into the EEPROM of the device. By selecting the "Save Settings" button, the changed checkweigher values are saved into the EEPROM of the device.

## 22.8 Setting Dialogs

Two measurement settings dialogs are available for adjusting device parameters for average measurement.

By selecting the "Checkweigher" button, the "Checkweigher" dialog will be opened. The "Checkweigher" dialog is explained in another section, so it will not be explained in this section.

By selecting the "Filter / tare" button, the "Filter / Tare" dialog will be opened. The "Filter / Tare" dialog is explained in another section, so it will not be explained in this section.

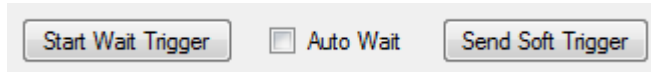


The "Filter / Tare" dialog can also be accessed by clicking on the net weight display.

## 22.9 Start wait trigger

This section describes an average measurement session step by step from waiting for a trigger signal to analyzing and changing the resulting measurement.

### 22.9.1 Waiting for a trigger signal



By selecting the "Start Wait Trigger" button an average measurement session will be started by waiting for a trigger signal from the H&B device. The "Average Measurement" dialog will look like the picture below.

The "Start Wait Trigger" button will have its text changed to "Stop Wait Trigger". Waiting for a trigger signal from the device can be aborted by selecting this "Stop Wait Trigger" button.

A trigger signal will be sent from the device when one of three conditions is fulfilled:

- The weight scale increments defined by the command "Trigger Increments" (TL) is reached.
- The device received a "Soft Trigger" (TR) command.
- A signal on input 0 is received by the device. (For the DAD141, this must be specified by the "AIx – Assign Input x" command. This command can be set in the "Input / Output" dialog.



## 22.10 Analyzing the measurement

When a trigger signal is received, the streamed measurement is started and will last for the time indicated by the time scale of the X-Axis on the scope display.

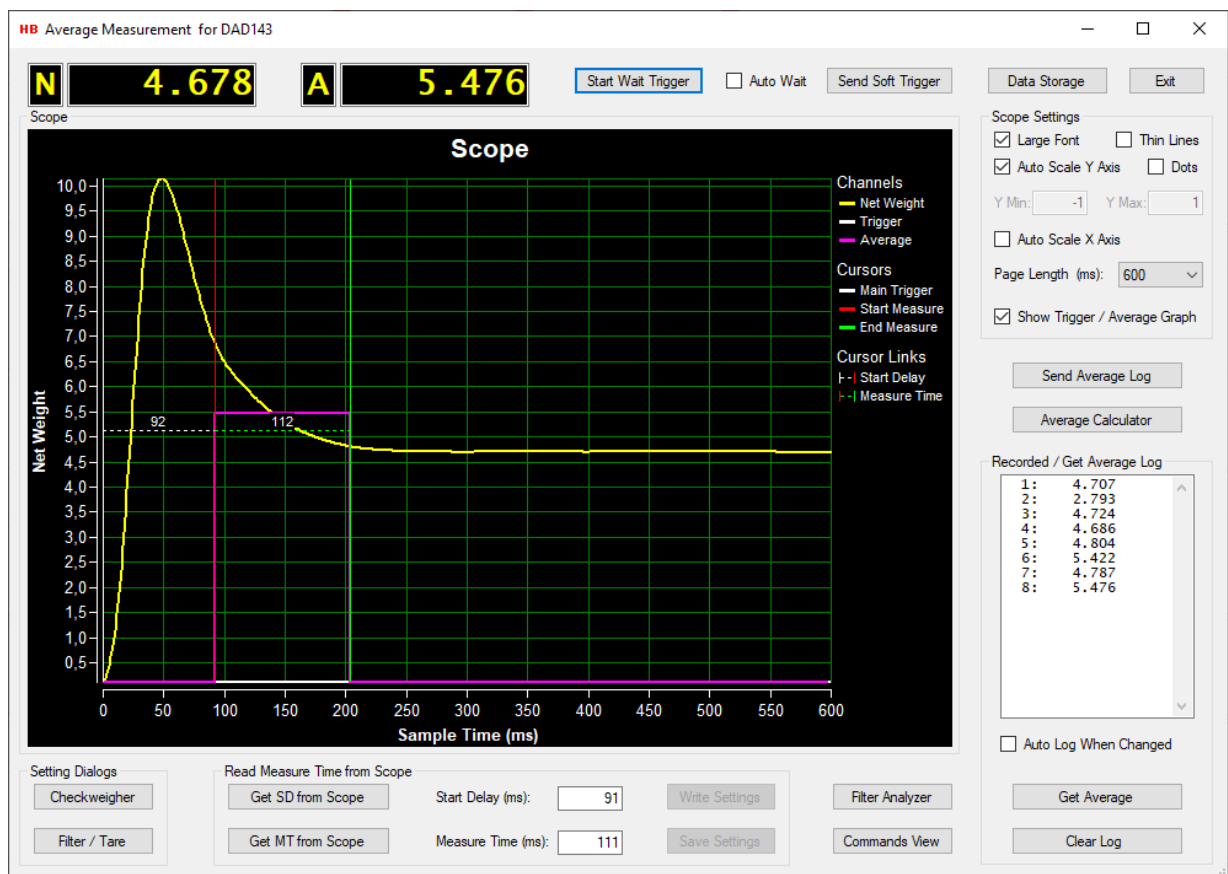
The received trigger signal is indicated by a white "Main Trigger" cursor line on the scope. The start of the average measurement is indicated by a red "Start Measure" cursor line on the scope display.

The end of the average measurement is indicated by a green "End Measure" cursor line on the scope display.

If a new trigger signal is received during recording, the "Main Trigger" cursor will be redrawn at the time stamp position where the signal was received.

Only one "Main Trigger" cursor line can be displayed for each measurement, so if a "Main Trigger" cursor is already present on the scope display, this current "Main Trigger" cursor will be deleted.

The same goes for the "Start Measure" and the "End Measure" cursor lines, they can only be presented on the scope display at one place, so these cursors will also be deleted if redrawn.



The length of the actual start delay and the actual measure time is indicated on the scope display by the "Start Delay" cursor link and the "Measure Time" cursor link.

Having a look on the recorded measurement, the start delay could be adjusted a bit to the right on the scale to improve the accuracy of the measurement.

By using the mouse, the "Start Measure" cursor can be moved to a more correct place at the time scale. The same goes for "End Measure" cursor.

### 22.10.1 Adjusting the measurement parameters

As explained in the previous section, the "Start Measure" cursor line and the "End Measure" cursor line can be moved back and forward on the time scale by using the mouse.

On the picture below it can be seen that the "Start Measure" cursor has been moved a bit to the right using the mouse and hereby increased the start delay time, as indicated by the cursor link "Start Delay".

The length of the measurement is hereby also decreased, as can be seen by the "Measure Time" cursor link.

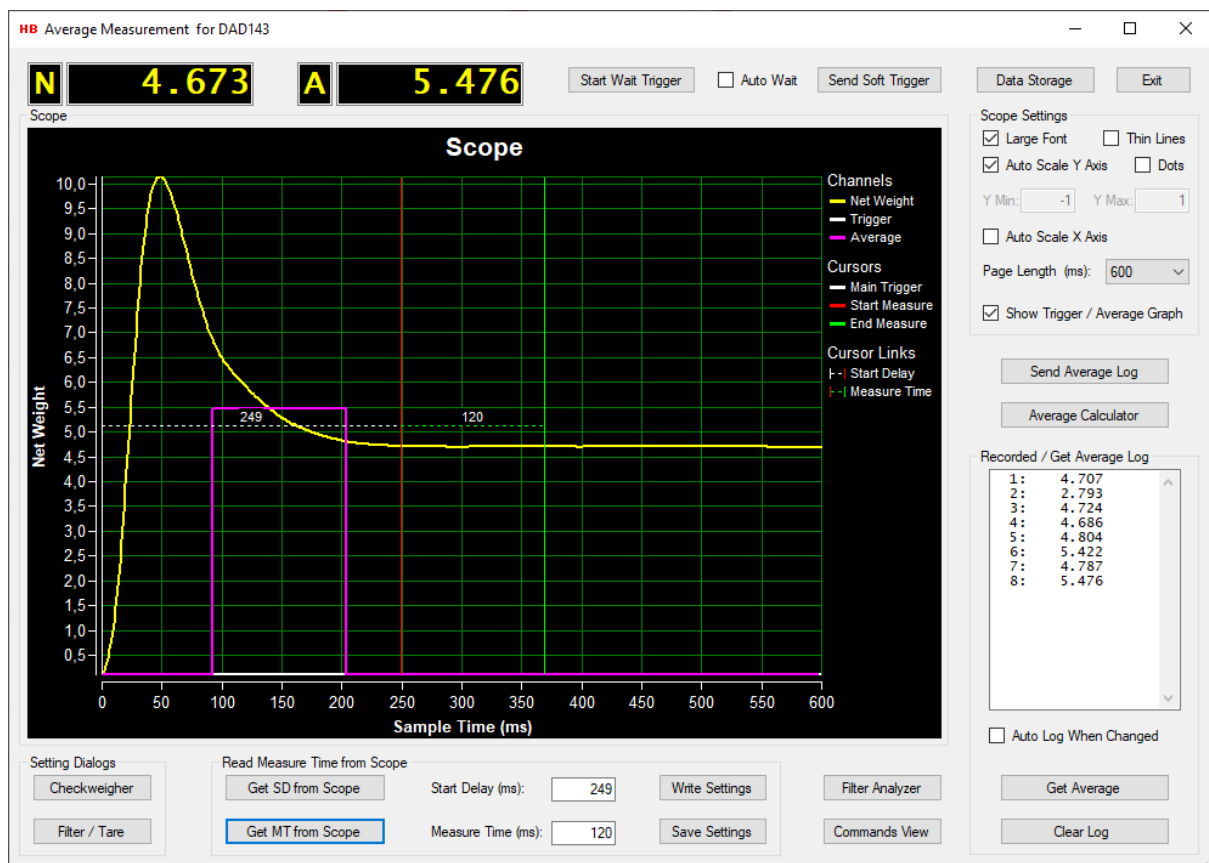
By selecting the "Get SD from Scope" button, the start delay value from the "Start Delay" cursor link will be written to the "Start Delay" text field.

Using the "Start Delay" text field is explained in another section of this manual.

By selecting the "Get MT from Scope" button, the measure time value from the "Measure Time" cursor link will be written to the "Measure Time" text field.

Using the "Measure Time" text field is explained in another section of this manual.

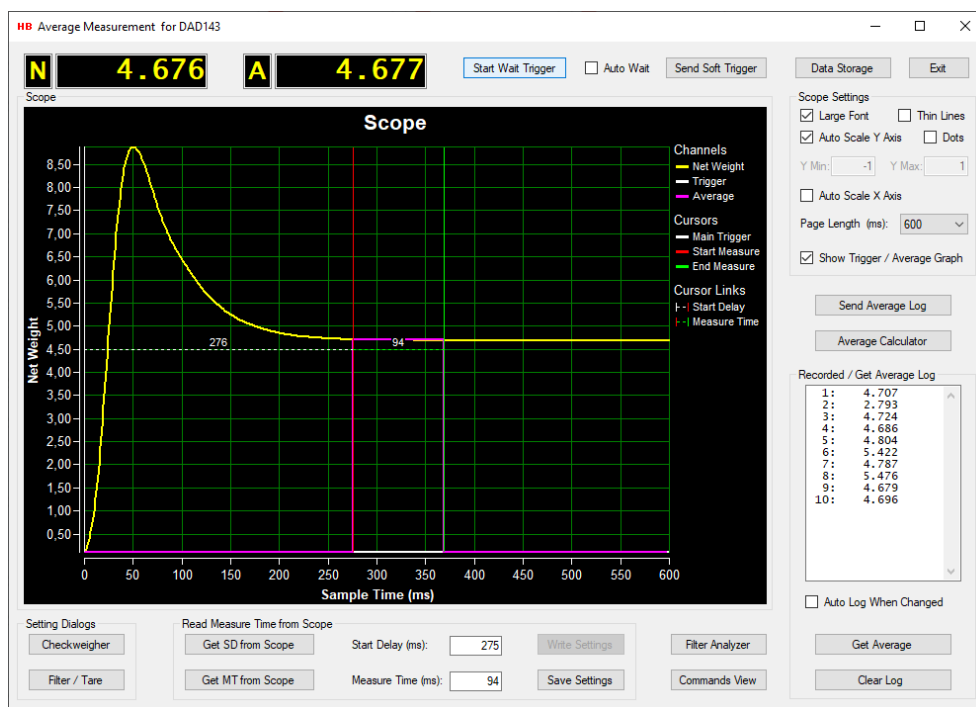
The fields can also be updated manually as explained in the section covering this subject.



By decreasing the value of the "Page Length" drop down box, a more detailed picture of the measurement can be seen.

The figures next page shows the final recording with the adjusted start delay.

## 22.10.2 Testing the changed parameters



The figure above shows the final result after using the adjusted parameters.



The figure above shows the final result without the average graph.

By selecting the "Write Settings" and "Save Settings" buttons, the values of the start delay (SD) and the measure time (MT) can be saved as explained in the section covering this subject.

### 22.10.3 Receiving a re-trigger signal

For H&B devices supporting the retrigger signal, a re-trigger measurement can be recorded to the scope display.

The start of the re-trigger measurement is indicated by an orange "Start Re-Trigger" cursor line on the scope.

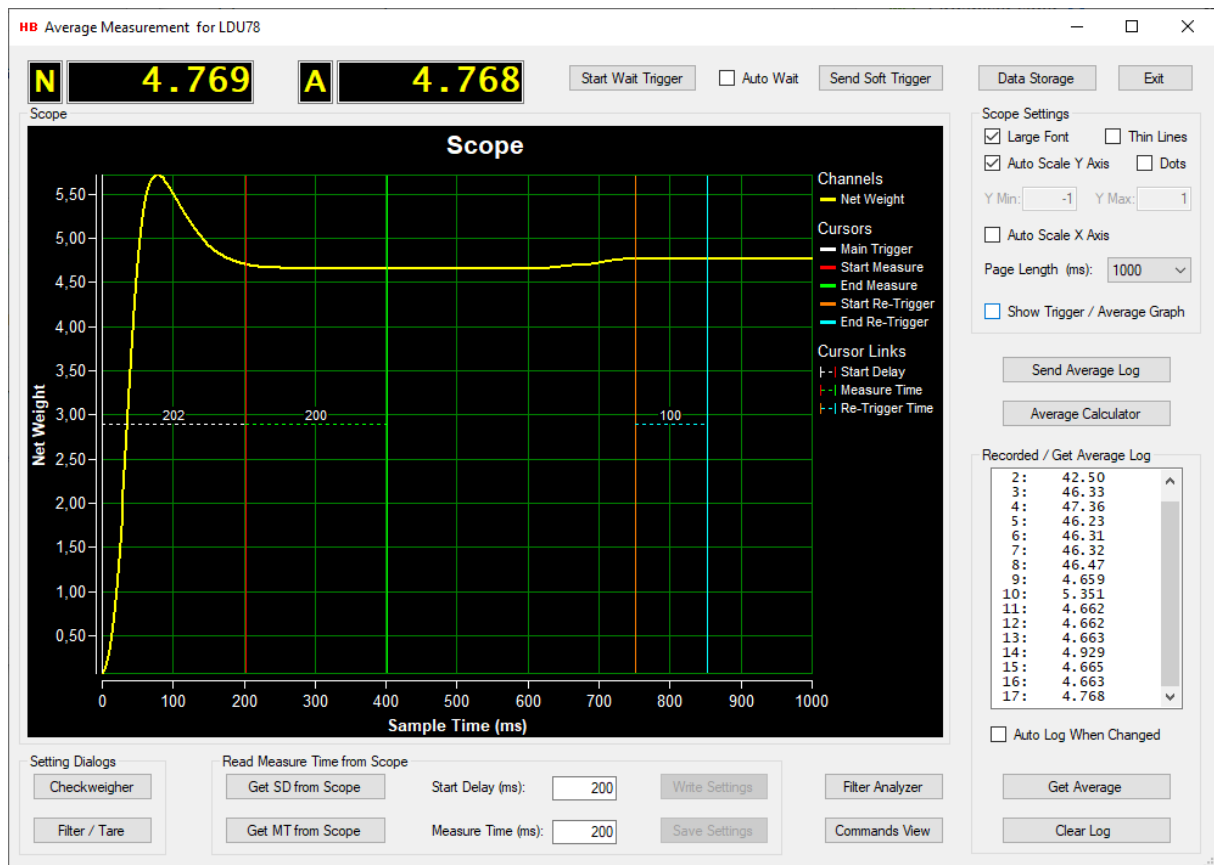
The end of the re-trigger measurement is indicated by a blue "End Re-Trigger" cursor line on the scope.

If a new re-trigger trigger signal is received during recording, the "Start Re-trigger" cursor line will be redrawn at the time stamp position where the signal was received.

Only one "Start Re-Trigger" cursor line can be displayed for each measurement, so if a "Start re-trigger" cursor line is already present on the scope display, this cursor line will be deleted.

The same goes for the "End Re-trigger" cursor line it can only be presented on the scope display at one place, so this cursor line will also be deleted if redrawn.

The retrigger time is indicated by the "Re-Trigger Time" cursor link.



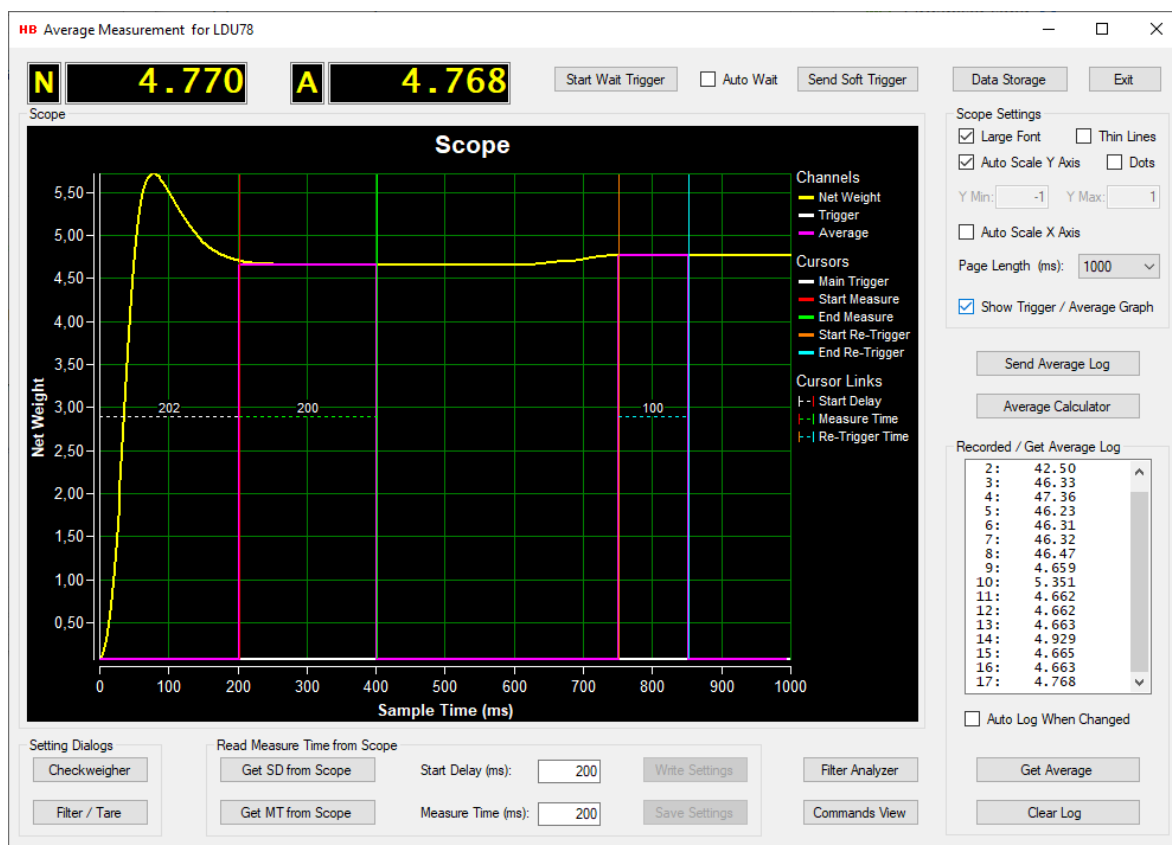
## 22.11 Show Trigger / Average Graph

By checking the "Show Trigger / Average Graph" check box a graph of the recorded average values will appear on the scope. This can be useful if more than one average measurement has been triggered during the recording. The trigger and average graphs can be stored together with the net weight graph.



The figure above shows a standard average measurement recording where three average triggers occurred during the recording.

The different average values measured during the recording can be examined by checking the top values on the average graph. The values will also be logged in the "Recorded / Get Average Log" window.

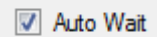


The figure above shows an average measurement recording where a retriggering occurred during the recording. Notice the 4 measurement cursors.

Notice that the different average values measured also appears in the "Recorded / Get Average Log" window.

## 22.12 Using Trigger Auto Wait

By checking the "Auto Wait" check box, the state of the average measurement dialog will remain in the record mode state and will after ending a recording session; automatically wait until a new trigger is received.



When a new trigger is received, the display will be cleared, and a new record session will start.

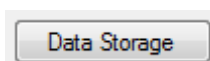
When in this record mode, the record state must be stopped manually by selecting the "Stop Wait Trigger" record button as the record state will keep on looping when in this "Auto Wait" state.



The recorded average values will be showed in the "Recorded / Get Average Log"

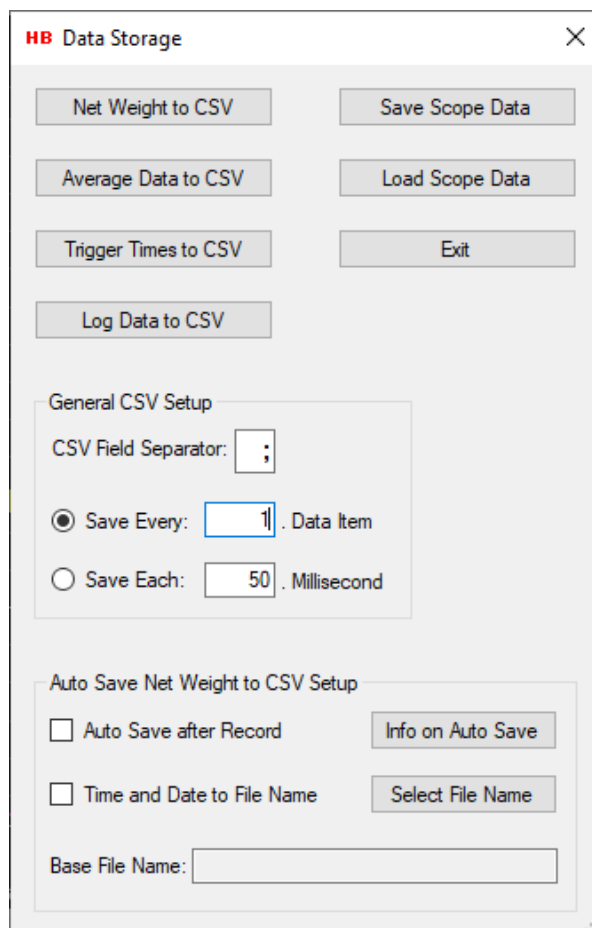
## 22.13 Data storage

By selecting the "Data Storage" button, the "Data Storage" dialog will be opened.



From the "Data Storage" dialog, the user can save recorded scope display data from the scope display to a disk file.

Only the present graphs will be saved, so if the "Show Trigger / Average Graph" check box is not checked, only the weight data will be saved as in older versions of the DOP 4 application.



### 22.13.1 Save scope display data as binary

The recorded scope display data can be saved as a binary file by selecting the "Save Scope Data" button. The saved scope display data can then later be reloaded into the scope object in the main window of the DOP 4 application, for further investigation.

By selecting the "Save Scope Data" button, the binary scope display data currently appearing on the scope will be saved as a binary file. A "Save File" dialog will appear, and a proper file name can be selected for the binary scope display data file.

The scope display data will be saved with the extension .rsd (Recorded Stream Data).

### 22.13.2 Load scope display data as binary

Previously saved recorded scope display data can be reloaded by selecting the "Load Scope Data" button.

By selecting the "Load Scope Data" button a "Load File" menu will appear.

By selecting a file with the extension .rsd (Recorded Stream Data) the scope object will be loaded with recorded stream data for the 3 measurements data channels.

The loaded scope display data can later again be saved as CSV data if wanted.

### 22.13.3 Save scope display data as CSV text files

Recorded scope display data can be saved as CSV (Comma Separated Values) text files, which can be loaded into for instance a Microsoft Excel application for further investigation.

By selecting the "Weight Data to CSV" button, the scope display weight data, will be saved as a CSV file.

By selecting the "Average Data to CSV" button, the scope display average data, will be saved as a CSV file. This button is only visible if the "Show Trigger / Average Graph" check box is checked.

By selecting the "Trigger Times to CSV" button, the scope display trigger times, will be saved as a CSV file. This button is only visible if the "Show Trigger / Average Graph" check box is checked.

A "Save File" dialog will appear, and a proper file name can be selected for the CSV file. Scope channel data saved as CSV files are saved with the extension .csv.

The CSV data is saved as two columns, with the scale weight in the first column and the recorded time in milliseconds in the second column.

The figures show recorded net weight CSV data and trigger times from a LDU179 device, loaded into Microsoft Excel.

	A	B
1	459	0
2	456	1,666016
3	453	3,333008
4	450	5
5	447	6,666016
6	444	8,333008
7	441	10
8	438	11,66602

	A	B
1	1	0
2	1	1171,936
3	1	2361,004

### 22.13.4 Save average log data as CSV text file

Logged average data can be saved as a CSV (Comma Separated Values) text files which can be loaded into for instance a Microsoft Excel application for further investigation.

By selecting the "Log Data to CSV" button, the scope display data, will be saved as a CSV file.

A "Save File" dialog will appear, and a proper file name can be selected for the CSV file. Average log data saved as CSV files are saved with the extension .csv.

The CSV data is saved as two columns with the scale weight in the first column and the average data index in the second column.

The figure shows average CSV log data from a DAS72 device, loaded into Microsoft Excel.

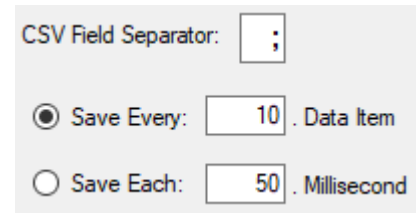
	A	B
1	0.0000	1
2	0.4146	2
3	0.3675	3
4	0.1143	4
5	0.1852	5
6	0.6908	6
7	0.7709	7
8	0.4563	8

### 22.13.5 CSV settings

In the text field "CSV Field Separator" the CSV field separator can be specified. By default, the separator character will be the separator character for the current country language used by the PC.

A limitation of the CSV data amount to be saved can be set in the text field "Save Every x. Data Item". If the value of the text field for instance is set to 100, only 1 out of 100 data items will be saved. One data item is saved, and the next 99 data items are skipped and so on. Set the field value to 1 if all items should be saved.

A time limit can also be defined so only data matching the defined data interval (equal or nearest higher) will be saved. If "Save Each" is set to 50 milliseconds, data with the time interval of 50 milliseconds (0, 50, 100, 150 ...) will be saved.



CSV Field Separator: ;

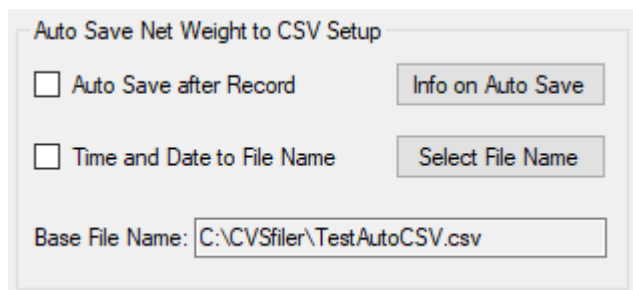
☒ Save Every: 10 . Data Item

☐ Save Each: 50 . Millisecond

### 22.13.6 Auto Save to CSV Setup

In the group box "Auto Save to CSV Setup" it can be generally defined if recorded scope data automatically should be saved to CSV files at the end of each scope data recording. By defining a base file name and checking the "Auto Save after Record" checkbox, recorded scope data will be stored to disk files at the end of each data recording.

A base file name can be defined by selecting the "Select File Name" button.



Auto Save Net Weight to CSV Setup

☐ Auto Save after Record [Info on Auto Save](#)

☐ Time and Date to File Name [Select File Name](#)

Base File Name: C:\CVSfiler\TestAutoCSV.csv

When the "Auto Save after Record" checkbox is checked, recorded scope data will be saved to the selected file name after the end of each scope data recording. Data will also be saved when using "Auto Wait".

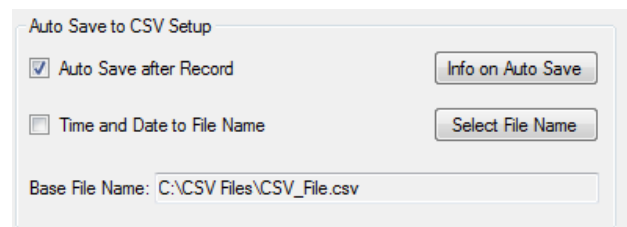
The date and time will be added to the base file name if the "Time and Date to File Name" checkbox is checked.

If the file name already exists when saving the data, existing data in the file will be overwritten.

Examples:

Using the setup at the right, recorded data from channel 1 will be saved as:

C:\CSV Files\CSV\_File.csv



Auto Save to CSV Setup

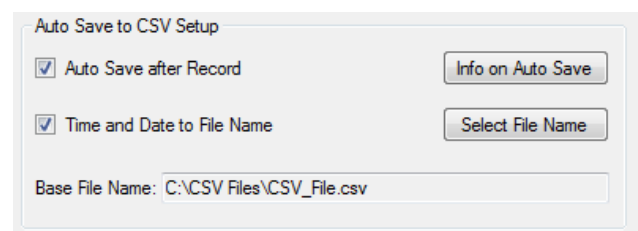
☒ Auto Save after Record [Info on Auto Save](#)

☐ Time and Date to File Name [Select File Name](#)

Base File Name: C:\CSV Files\CSV\_File.csv

Using the setup at the right, recorded data from channel 1 will be saved as:

C:\CSV Files\CSV\_File\_2021-12-24\_10-34-21.csv



Auto Save to CSV Setup

☒ Auto Save after Record [Info on Auto Save](#)

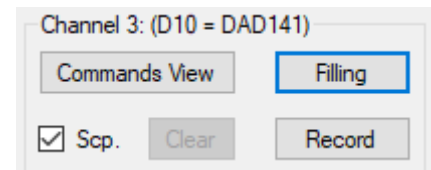
☒ Time and Date to File Name [Select File Name](#)

Base File Name: C:\CSV Files\CSV\_File.csv

Which is the time for saving the CSV file.

## 23 Dosed Measurement

If a given H&B device supports dosed measurement (Filling and / or drop filling), the "Filling" button for the channel group box in the main window, covering that device will be enabled and detailed dosed measurements can be obtained by selecting the "Filling" button.

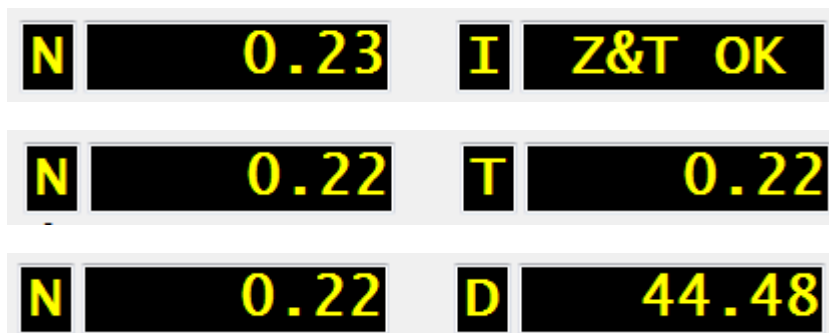


By selecting the "Filling" button for a device with filling firmware the "Dosed Measurement" dialog appears.

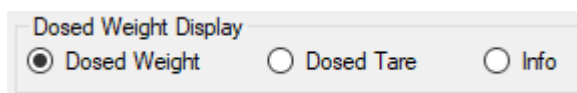
### 23.1 Weight value displays

In the top left corner of the dialog, there are two value displays containing dosed measurement information.

The first display shows the net weight values by polling the "Get Net" (GN) command.



The values of the second display can be controlled by the radio buttons of the "Dosed Weight Display" group box.



Selecting the radio button "Dosed Weight" the latest dosed weight value will be showed in the second display by polling the "Get Dosed" (GD) command.

Selecting the radio button "Dosed Tare" the latest dosed tare value will be showed in the second display by polling the "Dosed Tare" (DT) command.

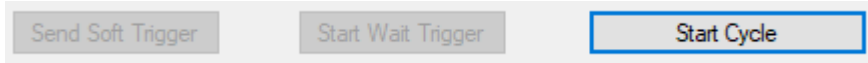
Selecting the radio button "Info" the latest dose info value will, in clear text, be showed in the second display by polling the "Dose Info" (DI) command.

The "Filter / Tare" dialog can be accessed by clicking on the net weight display.

## 23.2 Triggering buttons

When opening the "Dosed Measurement" dialog, the "Start / Stop Cycle" button will reflect the current state of the filling cycle process.

If the filling process is not started, the text of the "Start / Stop Cycle" button will be "Start Cycle". The "Start Wait Trigger" button and the "Send Soft Trigger" button will be disabled.



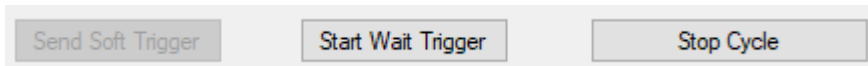
Selecting the "Start / Stop Cycle" button will toggle the filling cycle process.

Selecting the "Start Cycle" button, a start cycle command (SC) will be sent to the device. The text of the "Start Cycle" button will be changed to "Stop Cycle".

If a filling time out value is defined by the parameter "PD18 – Fill timeout value", the process will be stopped by the device when that time is reached, and a filling process is still ongoing. The text of the cycle button will be changed back to "Start Process".

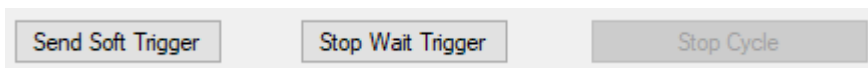
When the filling cycle process is started, the "Start Wait Trigger" button will be enabled.

An abort cycle (AC) will be sent to the device if the "Stop Cycle" button is selected. The "Start Wait Trigger" button will then again be disabled.



Selecting the "Start Wait Trigger" button will enable the "Send Soft Trigger" button. A dosed measurement recording will start when one out of three trigger signals is received as explained in the "Start wait trigger" section.

To be able to select the "Stop Cycle" button, in this wait for trigger state, the wait for trigger must be stopped by selecting the "Stop Wait Trigger" button to enable the "Stop Cycle" button.



The LDU78 filling device doesn't have support for the "Soft Trigger" command, so the "Send Soft Trigger" is not visible for this device.

### 23.3 Scope settings

The "Scope Settings" group box consists of several settings to adjust the behavior and appearance of the scope object.

By checking the "Large Font" check box, the weight and time values on the scope display will be displayed with a font size of 10. If unchecked the font size will be 8.

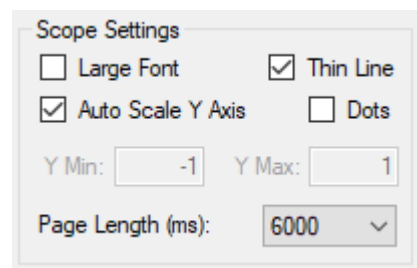
By checking the "Thin Line" check box, the size of the recorded scope graph lines will be 1 pixel wide. If unchecked, it will be 2 pixels wide.

By checking the "Dots" check box, the graph on the scope display will be displayed as dots, on positions matching the time stamp for the data received. This makes an easy way to measure the sample rate of the device, simply by counting dots on the screen. (You may have to set the page length to 100 ms).

By checking the "Auto Scale Y Axis" check box, the weight scale on the Y-Axis of the scope display is calculated automatic. If unchecked, the "Y Max" and "Y Min" text fields are enabled, and the user can enter some fixed Y-Axis scale values at choice.

The "Page Length" drop down box enables the user to choose the X-Axis scale time by making a time value choice from the drop-down value list.

For "Page Lengths" larger than 10000 ms, it can be recommended to check the "Thin Lines" check box when browsing through the scope display pages, as it's more time-consuming to display thick lines than thin lines. (Most commonly when using the main page scope display).



### 23.4 Dosed Weight log

The "Dosed Weight Log" group box contains information about the status of logging dosed measurements.

Dosed values triggered during a recording will be shown in the log window.

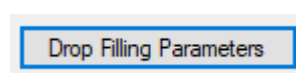
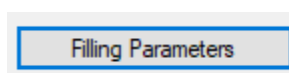
Dosed values can be read and logged manually by selecting the "Get Dosed Weight" button.

Selecting the "Clear Log" button will clear the content of the "Dosed Weight Log" text box.



### 23.5 Dosing Parameters

The "Filling Parameters" or "Drop Filling Parameters" button gives access to the filling parameters.



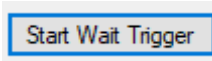
The "Dosing Parameters" can also be accessed from the "Filling" or "Drop Filling" dialogs to be found in the "Commands View" dialog.

## 23.6 Start wait trigger

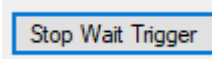
This section describes a dosed measurement session step by step from waiting for a trigger signal to analyzing the resulting measurement.

### 23.6.1 Waiting for a trigger signal

By selecting the "Start Wait Trigger" button a dosed measurement session will be started by waiting for one or two trigger signals from the H&B device. The "Dosed Measurement" dialog will look like the picture below.



The "Start Wait Trigger" button will have its text changed to "Stop Wait Trigger" and the waiting for a trigger signal from the device can be aborted by selecting this button.



A trigger signal will be sent from the device when one of three conditions is fulfilled:

- The device received a "Soft Trigger" (TR) command. (If supported by the selected device)
- A signal on input 0 is received by the device. (Value of PD3 different from 0)
- A signal on input 1 is received by the device.



## 23.7 Analyzing the measurement

When a trigger signal is received, the streamed measurement is started and will last the time indicated by the time scale of the X-Axis of the scope.

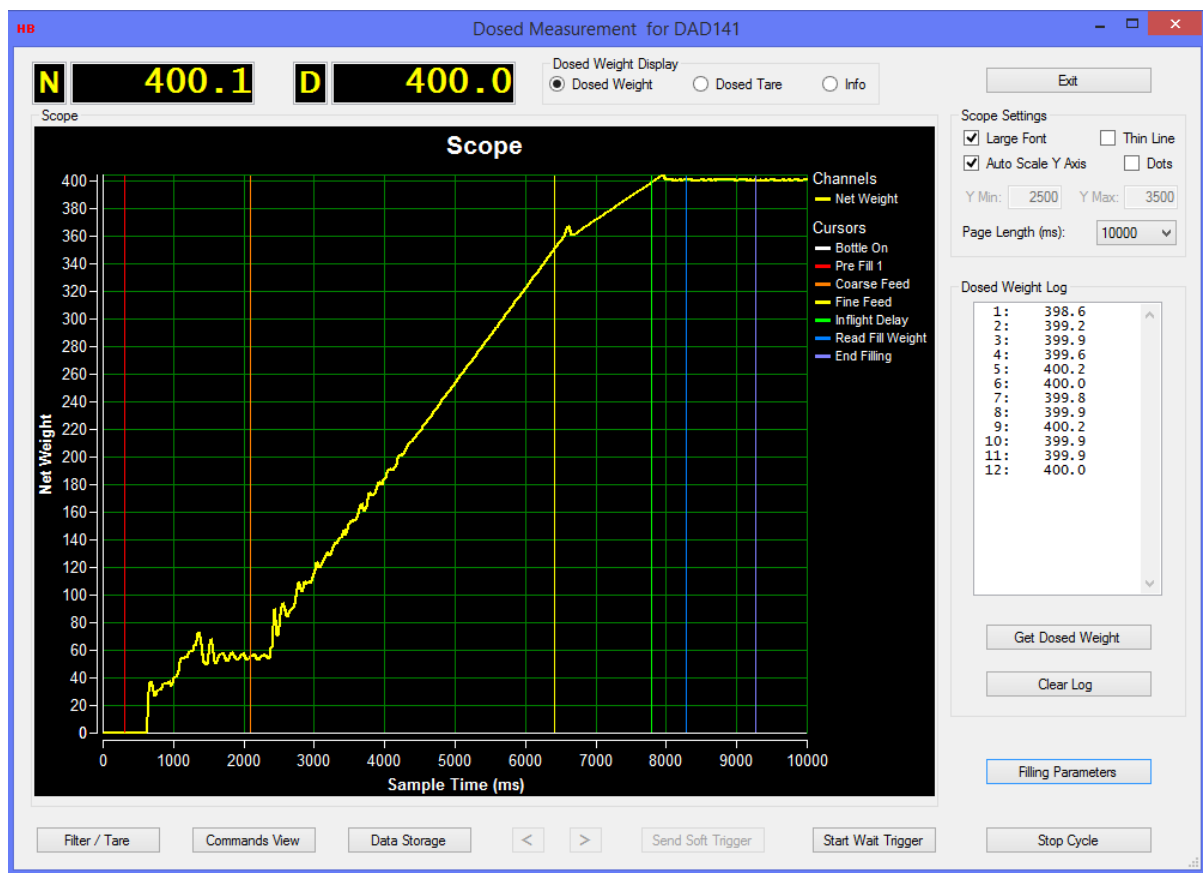
The received trigger signal is indicated by a white cursor line on the scope display.

Several different signal cursor lines depending on the measurement and weight conditions set up by the "Dosing Parameters" will now follow the trigger signal.

Each measurement signal cursor line is indicated by a specific color code to be interpreted by the color text under the "Cursor" section on the right side of the scope display.

If a signal cursor is somehow repeated during recording the first cursor line will be deleted and replaced by the new cursor line. Only one specific signal cursor line can be present on the scope display at one time.

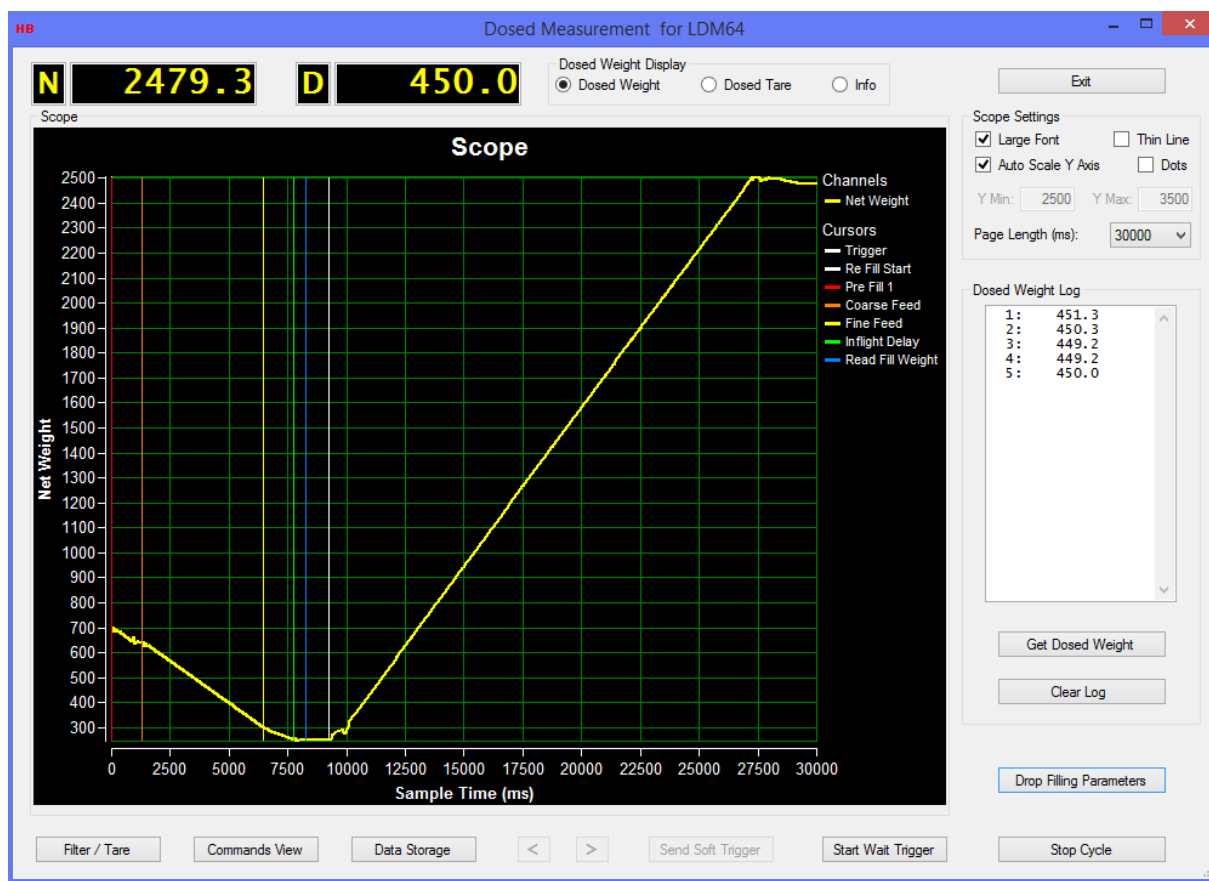
The meaning and interpretation of these signals is not within the scope of this manual to explain. Refer to the filling documentation for your specific H&B device.



The figure above shows the result of a successfully filling process.



The figure above shows the result of a successfully drop filling process.



The figure above shows the result of a drop filling process where a refill is needed.

## 23.8 Detailing the measurement

It's possible to analyze the dosed measurement session more detailed by decreasing the value of the page length after a measurement record.

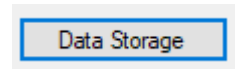


The measurement result will then be divided into several measurement pages, which then can be analyzed in detail by using the two arrows in the bottom of the "Dosed Measurement" dialog.



## 23.9 Data storage

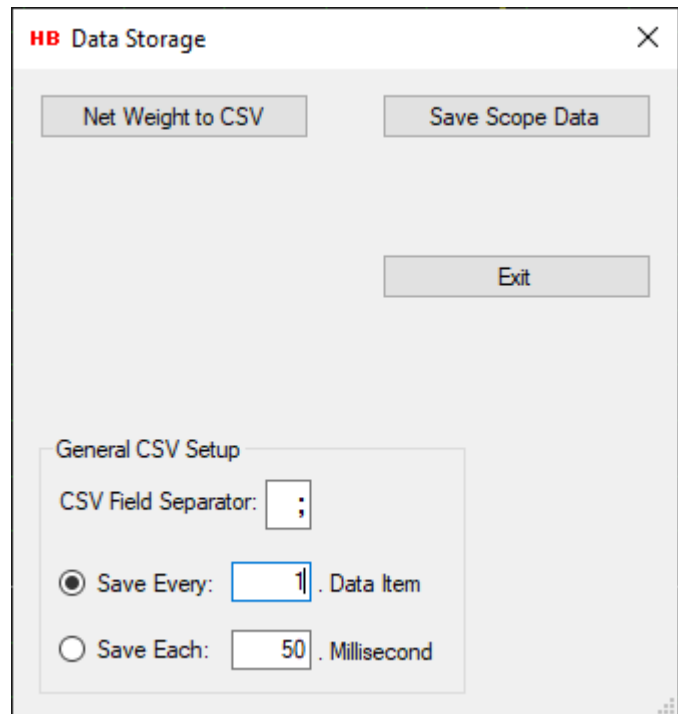
By selecting the "Data Storage" button, the "Data Storage" dialog will be opened.



In the "Data Storage" dialog the user can save recorded scope display data from the scope display to a disk file.

It's only possible to save the scope display data itself. The measuring signal cursor lines cannot be saved.

The stored measurement data must be reloaded in the main window for later analyzing.



### 23.9.1 Save scope display data as binary

The recorded scope display data can be saved as a binary file by selecting the "Save Scope Data" button. The saved scope display data can then later be reloaded into the scope object in the main window of the DOP 4 application, for further investigation.

By selecting the "Save Scope Data" button, the binary scope data currently appearing on the scope will be saved as a binary file. A "Save File" dialog will appear, and a proper file name can be selected for the binary scope display data file.

The scope display data will be saved with the extension .rsd (Recorded Stream Data).

### 23.9.2 Save scope display data as CSV text files

Recorded scope display data can be saved as a CSV (Comma Separated Values) text files which can be loaded into for instance a Microsoft Excel application for further investigation.

By selecting the "Weight Data to CSV" button, the scope display data, will be saved as a CSV file.

A "Save File" dialog will appear, and a proper file name can be selected for the CSV file. Scope channel data saved as CSV files are saved with the extension .csv.

The CSV data is saved as two columns with the scale weight in the first column and the recorded time in milliseconds in the second column.

	A	B
1	459	0
2	456	1,666016
3	453	3,333008
4	450	5
5	447	6,666016
6	444	8,333008
7	441	10
8	438	11,66602

The figure shows recorded CSV data from H&B device, loaded into Microsoft Excel.

### 23.9.1 CSV settings

In the text field "CSV Field Separator" the CSV field separator can be specified. By default, the separator character will be the separator character for the current country language used by the PC.

A limitation of the CSV data amount to be saved can be set in the text field "Save Every x. Data Item". If the value of the text field for instance is set to 100, only 1 out of 100 data items will be saved. One data item is saved, and the next 99 data items are skipped and so on. Set the field value to 1 if all items should be saved.

A time limit can also be defined so only data matching the defined data interval (equal or nearest higher) will be saved. If "Save Each" is set to 50 milliseconds, data with the time interval of 50 milliseconds (0, 50, 100, 150 ...) will be saved.

CSV Field Separator:

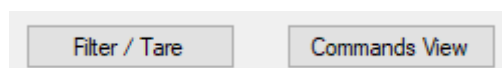
☒ Save Every:  . Data Item

☐ Save Each:  . Millisecond

## 23.10 Other dialogs

Two other dialogs are available for adjusting device parameters and saving scope display data for dosed measurement.

The "Commands View" dialog and the "Filter / Tare" dialog are explained in another section, so it will not be explained in this section.



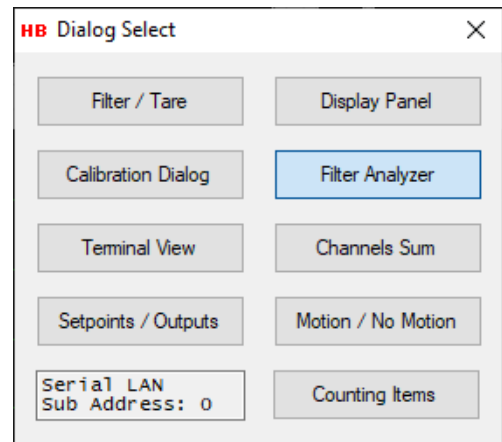
The "Filter / Tare" dialog can also be accessed by clicking on the net weight display.

## 24 Filter Analyzer

By selecting the "Filter Analyzer" button in the popup menu "Dialog Select" as explained in the section covering "Dialog Shortcuts", the "Filter Analyzer" dialog will be opened.

From the "Filter Analyzer" dialog an unfiltered load cell recording can be executed. The different filters which are available from the "Filter / Tare" dialog can then be applied to the unfiltered record and the result can be compared so the best suitable filter value then later can be selected from the "Filter / Tare" dialog.

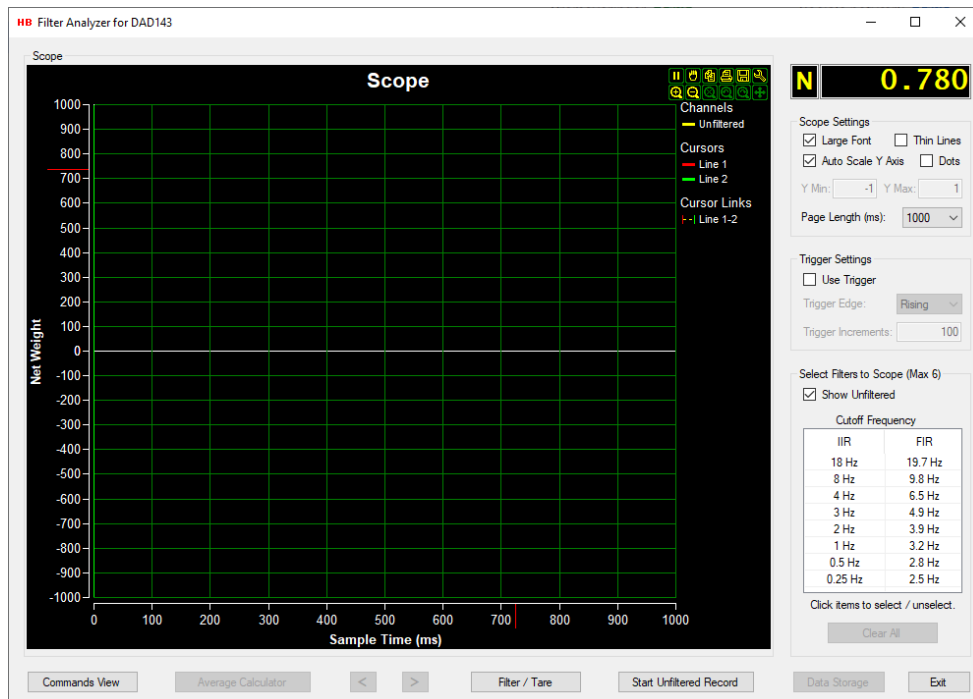
The Filter graphs are calculated internally in the DOP 4 application using the same algorithms which are used in the devices when calculating the filters.



Up to 6 filters can be applied for comparing at the same time.

The LDU68 and LDU69 devices are not supported for the "Filter Analyzer" dialog. Also, the device for the selected channel must be using the Serial COM, the Serial LAN or the CANopen interface.

For some of the low frequency IIR filters below 1 Hz, a settle period up to a couple of seconds may be expected. Set the record time for more than 3 seconds if using these filters.



### 24.1 Weight value displays

In the top right corner of the dialog there is a weight value display located showing the actual net weight from the load cell.

**N -0.0003**

The "Filter / Tare" dialog for the current device can be accessed by clicking on the weight value display.

## 24.2 Scope settings

The "Scope Settings" group box consists of several settings to adjust the behavior and appearance of the scope object.

By checking the "Large Font" check box, the weight and time values on the scope display will be displayed with a font size of 10. If unchecked the font size will be 8.

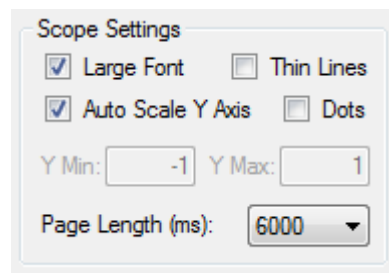
By checking the "Thin Line" check box, the size of the recorded scope graph lines will be 1 pixel wide. If unchecked, it will be 2 pixels wide.

By checking the "Dots" check box, the graph on the scope display will be displayed as dots, on positions matching the time stamp for the data received. This makes an easy way to measure the sample rate of the device, simply by counting dots on the screen. (You may have to set the page length to 100 ms).

By checking the "Auto Scale Y Axis" check box, the weight scale on the Y-Axis of the scope display is calculated automatic.

If unchecked, the "Y Max" and "Y Min" text fields are enabled, and the user can enter some fixed Y-Axis scale values at choice.

The "Page Length" drop down box enables the user to choose the X-Axis scale time by making a time value choice from the drop-down value list.



## 24.3 Trigger Settings

In the "Trigger Settings" group box, the set up for waiting for a specific trigger level to be reached before a scheduled unfiltered recoding should start can be set.

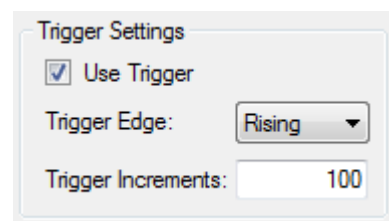
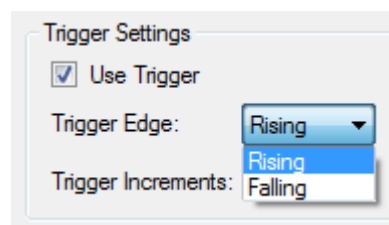
By checking the "Use Trigger" check box, a scheduled recording ("Start Unfiltered Record" button selected) will not start the actual recording to the scope display before the increments value of the "Trigger Increments" text field is reached by increasing or decreasing the weight on the scale.

The increments value is the weight value to be reached without the decimal point. So, 0.200 and 2.00 equals both 200 increments.

Both negative and positive integer values can be entered to the "Trigger Increments" field.

By selecting "Rising" from the "Trigger Edge" drop down box, the recording will start when the increments value is reached from a value lower than the increments value.

By selecting "Falling" from the "Trigger Edge" drop down box, the recording will start when the increments value is reached from a value higher than the increments value.

## 24.4 Select Filters

From the "Select Filters to Scope" group box, the available filter values can be selected by clicking on one or more of the "Cutoff Frequency" value fields. The selected value filters will be applied to the recorded unfiltered measurement and showed as a graph with the same color as the selected field on the scope.

Up to 6 filter channels can be selected at the same time.

By clicking on a previously selected filter value, the selected field will be unselected.



The dialog box 'Select Filters to Scope (Max 6)' contains a 'Show Unfiltered' checkbox and a table of Cutoff Frequencies. The table has two columns: IIR and FIR. The frequencies are 18 Hz, 8 Hz, 4 Hz, 3 Hz, 2 Hz, 1 Hz, 0.5 Hz, and 0.25 Hz. The 'Clear All' button is at the bottom.

IIR	FIR
18 Hz	19.7 Hz
8 Hz	9.8 Hz
4 Hz	6.5 Hz
3 Hz	4.9 Hz
2 Hz	3.9 Hz
1 Hz	3.2 Hz
0.5 Hz	2.8 Hz
0.25 Hz	2.5 Hz

By unchecking the "Show Unfiltered" checkbox, the unfiltered recording will be removed from the scope so only the graphs of the selected filters are visible on the scope.

The "Show Unfiltered" checkbox will be rechecked at the start of a new unfiltered recording.

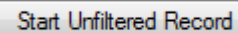
By selecting the "Clear All" button all the selected filter values fields, will be unselected.

The channels for the selected filter values can also be seen in the scope picture in the upper right corner showing which frequency a given graph color is representing.

<b>Channels</b>	
<span style="color: yellow;">—</span>	Unfiltered
<span style="color: red;">—</span>	IIR 1 Hz
<span style="color: cyan;">—</span>	IIR 8 Hz
<span style="color: green;">—</span>	IIR 0.25 Hz
<span style="color: orange;">—</span>	FIR 6.5 Hz
<span style="color: magenta;">—</span>	FIR 3.9 Hz
<span style="color: blue;">—</span>	FIR 2.8 Hz
<b>Cursors</b>	
<span style="color: red;">—</span>	Line 1
<span style="color: green;">—</span>	Line 2
<b>Cursor Links</b>	
<span style="color: red;">—</span> <span style="color: green;">—</span>	Line 1-2

## 24.5 Start unfiltered record

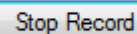
By selecting the "Start Unfiltered Record" button the current filter value of the connected device will be read and stored for later to be restored into the device when the recording stops.



A filter value parameter with the value of 0 will be sent to the device, so when the load cell recording starts, the incoming result showed on the scope will be the result of an unfiltered recording.

When the recording is stopped, the original filter value will be restored to the connected device.

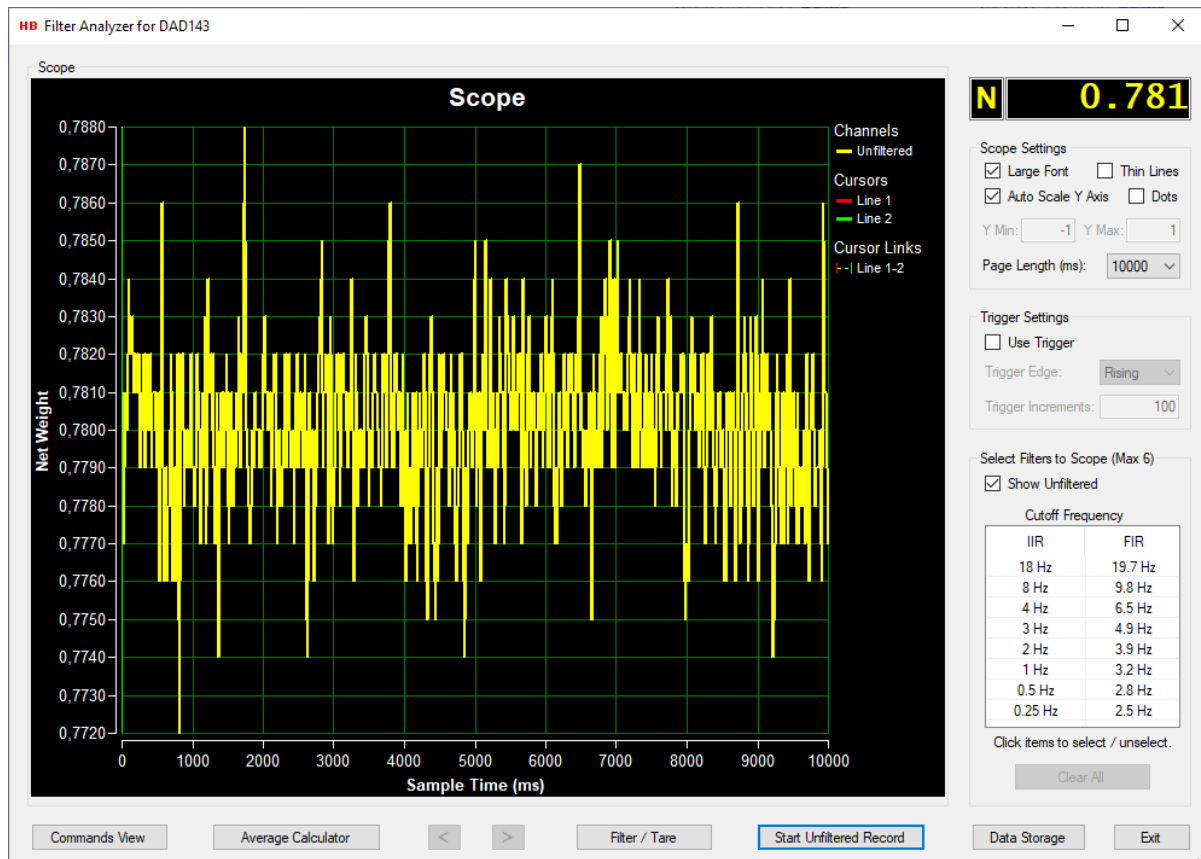
The "Start Unfiltered Record" button will have its text changed to "Stop Record". By selecting the button at this stage, the ongoing recording will be canceled.



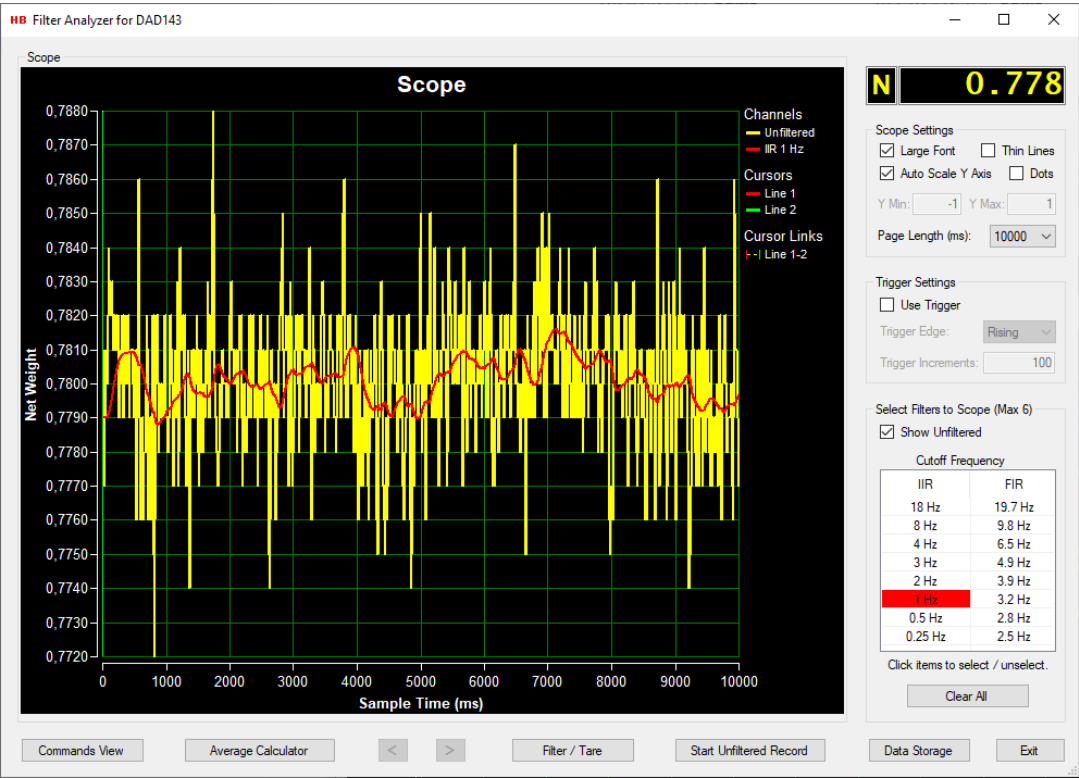
If waiting for a trigger value to be reached, the scheduled recording can this way be aborted by selecting the "Stop Record" button.

If the "Use Trigger" checkbox is checked, the unfiltered recording will not start, before the increments value of the "Trigger Increments" text field is reached by increasing or decreasing the weight on the scale as explained earlier.

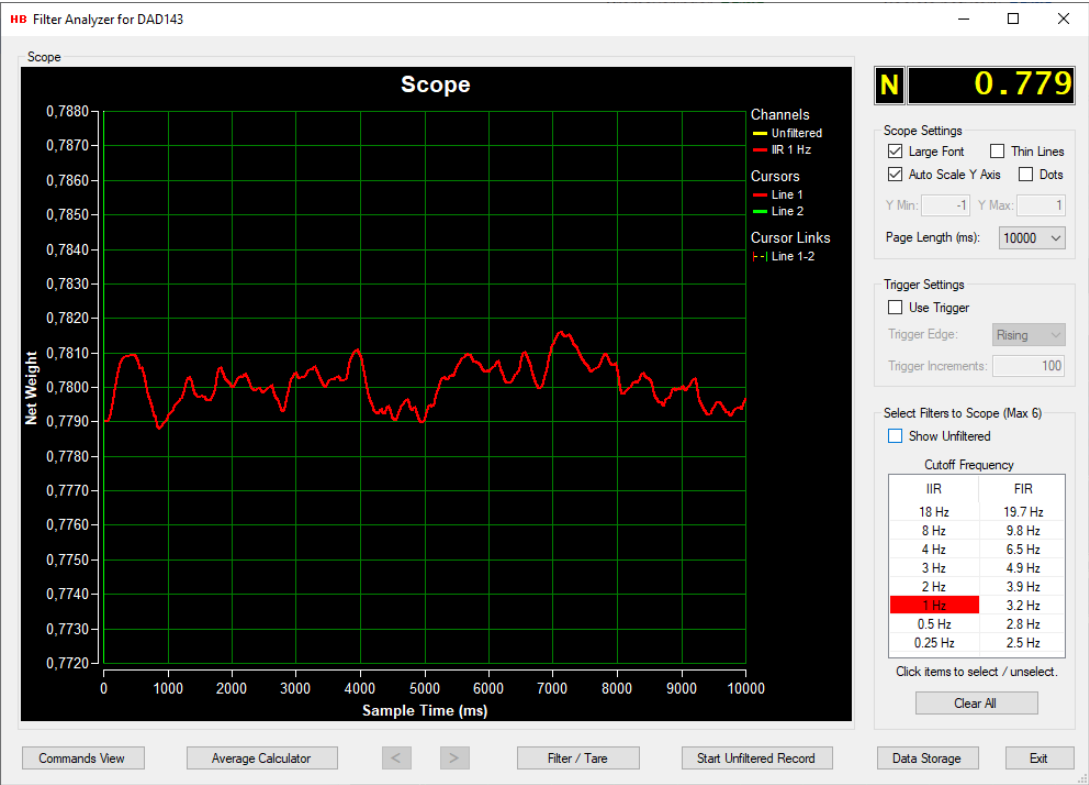
The figure below shows an example of an unfiltered recording. No filters are selected in this example.



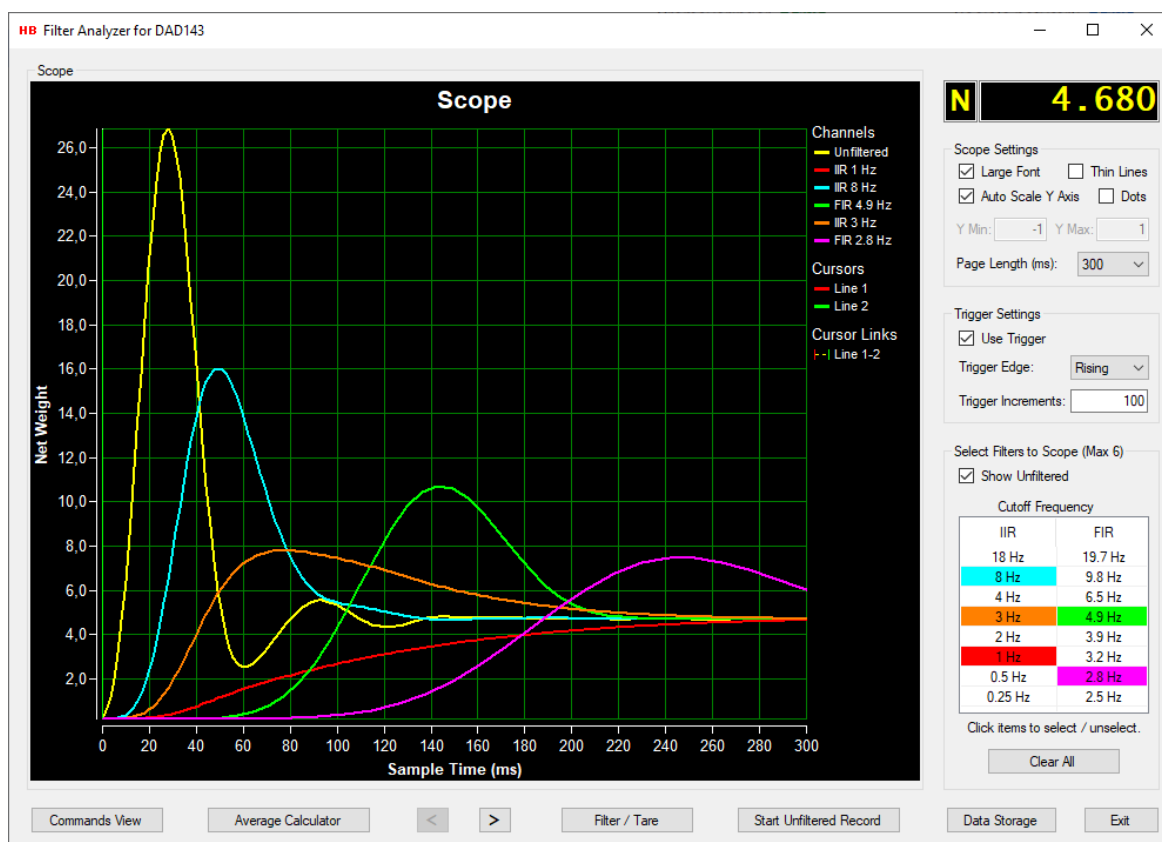
The figure below shows the previous example with the 1Hz IIR filter selected.



The figure below shows the previous example with the 1Hz IIR filter selected, and the "Show Unfiltered" check box unchecked.



The figure below shows an example of 6 filters selected and the "Show Unfiltered" check box checked. The yellow graph is the original unfiltered recording.



## 24.6 Detailing the analyzing

It's possible to analyze the unfiltered and filtered graphs more detailed by decreasing the value of the page length after an unfiltered recording.



The measurement result will then be divided into several measurement pages, which then can be analyzed in detail by using the two arrows in the bottom of the "Filter Analyzer" dialog.



## 24.7 Average Calculator

By selecting the "Average Calculator" button, the "Average Calculator" dialog will be opened.

The "Average Calculator" will ongoing calculate the average value of all the filter graphs present on the scope between the red cursor line and the green cursor line. If not present, the two cursor lines can be found on the left side of the scope.

The average of the graph's values between the two cursor lines will be updated every time one of the cursors is moved or an unfiltered record is done. So, by moving around the cursors using the mouse, it is possible to ongoing calculate the average of the filter graphs values on different areas of the scope window.

The number of samples found between the two cursor lines are also showed in the table.

From the positions of the cursor lines, the start delay time and the measure time is ongoing updated and showed in the "Start Delay Time" and the "Measure Time" fields.

If the connected device is of type checkweigher, it is possible to save the time values defined by the positions of the two cursor lines as "SD – Start Delay" and "MT – Measure Time" to be used later for check weighing.

Average Calculator

**HB Average Calculator**

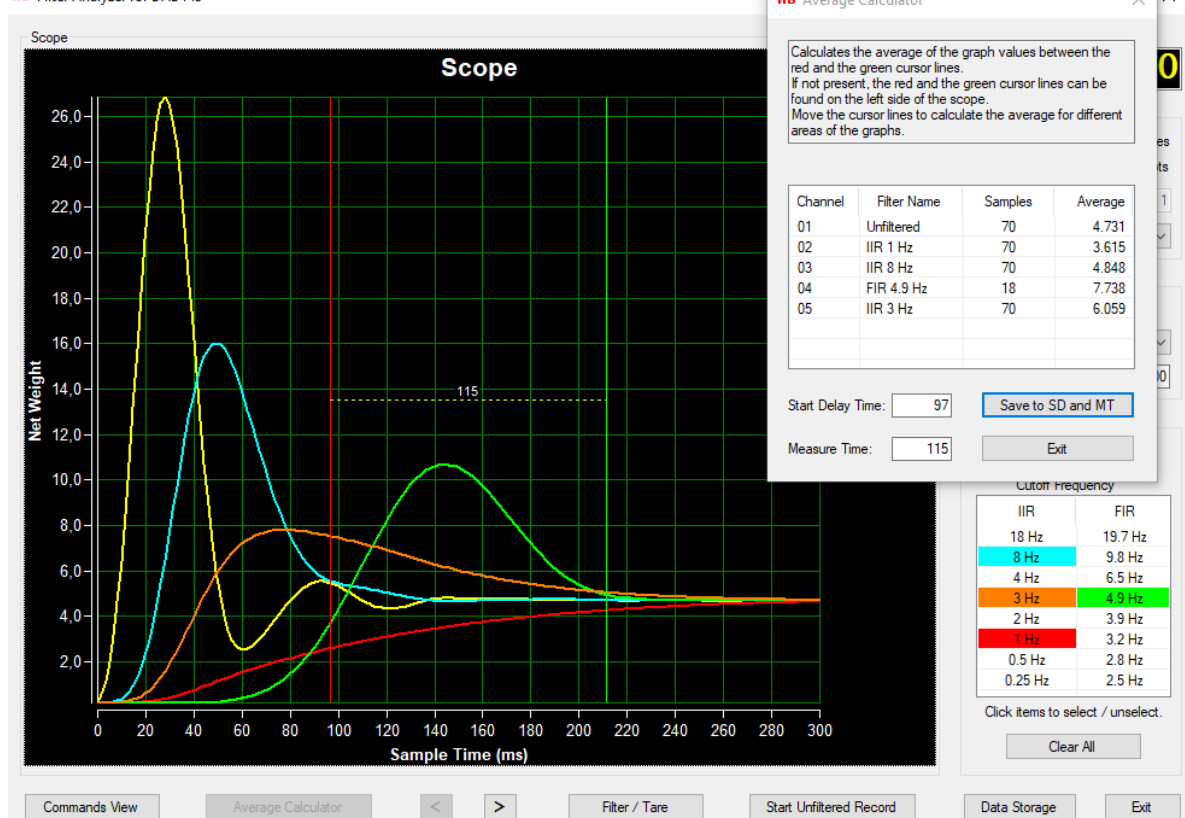
Calculates the average of the graph values between the red and the green cursor lines.  
If not present, the red and the green cursor lines can be found on the left side of the scope.  
Move the cursor lines to calculate the average for different areas of the graphs.

Channel	Filter Name	Samples	Average
01	Unfiltered	35	4.702
02	IIR 1 Hz	35	4.550
03	IIR 8 Hz	35	4.702
04	FIR 4.9 Hz	9	4.730
05	IIR 3 Hz	35	4.795

Start Delay Time:

Measure Time:

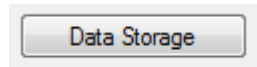
HB Filter Analyzer for DAD143



## 24.8 Data storage

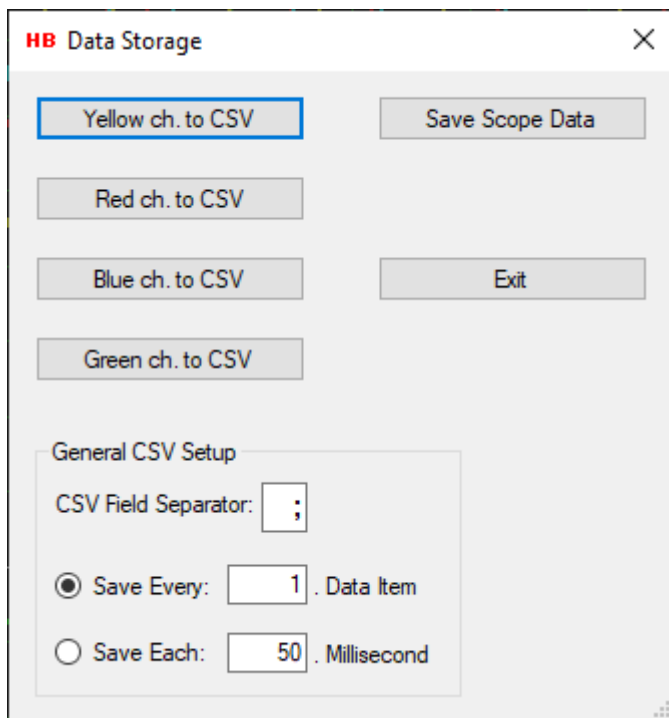
By selecting the "Data Storage" button, the "Data Storage" dialog will be opened.

From the "Data Storage" dialog the user can save recorded scope display data from the scope display to a disk file.



Only the unfiltered yellow graph and the red, blue, and green filter graphs can be stored at the same time, due to the 4 channels limitation on the main window of the DOP 4.

The stored measurement data must be reloaded in the main window for later analyzing.



### 24.8.1 Save scope display data as binary

The recorded scope display data can be saved as a binary file by selecting the "Save Scope Data" button. The saved scope display data can then later be reloaded into the scope object in the main window of the DOP 4 application, for further investigation.

Only the unfiltered yellow graph and the red, blue, and green filter graphs can be stored at the same time, due to the 4 channels limitation on the main window of the DOP 4.

By selecting the "Save Scope Data" button, the binary scope data currently appearing on the scope will be saved as a binary file. A "Save File" dialog will appear, and a proper file name can be selected for the binary scope display data file.

The scope display data will be saved with the extension .rsd (Recorded Stream Data).

### 24.8.2 Save scope display data as CSV text files

Recorded scope display data can be saved channel by channel as a CSV (Comma Separated Values) text files, which can be loaded into for instance a Microsoft Excel application for further investigation.

Only the unfiltered yellow graph and the red, blue and green filter graphs can be stored to a CSV file.

By selecting one of the "Color x to CSV" buttons, the scope display data for that specific channel, will be saved as a CSV file. A "Save File" dialog will appear, and a proper file name can be selected for the CSV file. Scope display data saved as CSV files are saved with the extension .csv.

Only the "Color x to CSV" buttons where the channel they represent having recorded data on the scope display will be enabled.

The CSV data is saved as two columns with the scale weight in the first column and the recorded time in milliseconds in the second column.

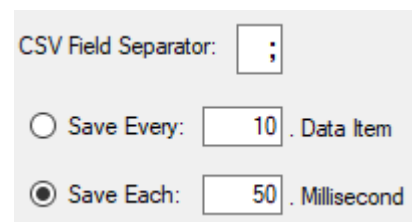
	A	B	C
1	459	0	
2	456	1,666016	
3	453	3,333008	
4	450	5	
5	447	6,666016	
6	444	8,333008	
7	441	10	
8	438	11,66602	
9	434	13,33301	
10	431	15	
11	428	16,66602	
12	424	18,33301	
13	421	20	

The figure shows recorded CSV data from an H&B device, loaded into Microsoft Excel.

### 24.8.3 CSV Settings

In the text field "Field Separator" the CSV field separator can be specified. By default, the separator character will be the separator character for the current country language used by the PC.

A limitation of the CSV data amount to be saved can be set in the text field "Save Every x. Data Item". If the value of the text field for instance is set to 100, only 1 out of 100 data items will be saved. One data item is saved, and the next 99 data items are skipped and so on. Set the field value to 1 if all items should be saved.



CSV Field Separator: ;

☐ Save Every: 10 . Data Item

☒ Save Each: 50 . Millisecond

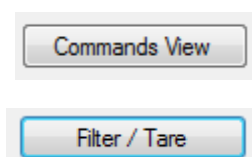
A time limit can also be defined so only data matching the defined data interval (equal or nearest higher) will be saved. If "Save Each" is set to 50 milliseconds, data with the time interval of 50 milliseconds (0, 50, 100, 150 ...) will be saved.

## 24.9 Other dialogs

Two other dialogs are available for adjusting device parameters and saving scope display data for unfiltered and filtered graphs.

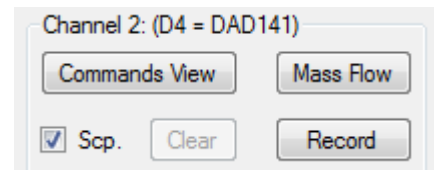
The "Commands View" dialog and the "Filter / Tare" dialog are explained in other sections, so they will not be explained in this section.

The "Filter / Tare" dialog can also be accessed by clicking on the net weight display.



## 25 Mass Flow Measurement

If a given H&B device supports mass flow measurement, the "Mass Flow" button for the channel group box in the main window, covering that device will be enabled and the "Mass Flow Measurement" dialog will appear where detailed mass flow measurements can be obtained. Currently only the DAD141 / DAD142 device is supporting the "Mass Flow Measurement" dialog.



The pictures showed and the function described in this section may be a bit different from the functions in the latest version of the DOP 4. It will be corrected when the final mass flow function is in place for the DAD141.



By selecting the "Mass Flow" button for a device with mass flow firmware the "Mass Flow Measurement" dialog will be opened.

## 25.1 Weight value displays

In the top left corner of the dialog, there are three value displays containing mass flow measurement information.

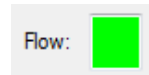


The first display shows the net weight values by polling the "Get Net" (GN) command.

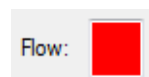
The second display shows the flow values by polling the "Get Flow" (GF) command.

The third display shows the PID rate values by polling the "PID Rate" (GD) command. The command is in general called "Flow Rate" command, but in this dialog the term "PID Rate" is used. PID stands for Proportional Integral / Differential.

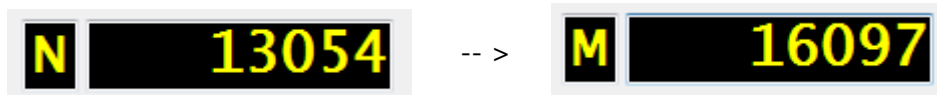
In an additional the "Flow:" display, is indicating if a flow is currently ongoing with the color of green. The net value is decreasing.



If the flow stops or the net weight is increasing by a refilling of tanks, it will be indicated with the color of red.

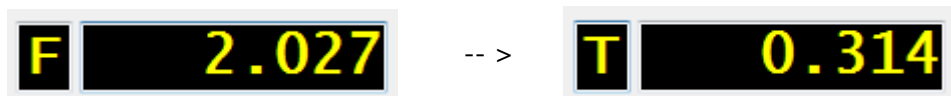


By clicking on the "Net Weight" display, the value of the display will toggle between "Net Weight" and "Total Mass Flow".



When doing recordings, only the "Net Weight" display can be selected.

By clicking on the "Flow" display, the value of the display will toggle between "Flow" and "Trend".



When doing recordings, only the "Flow" display can be selected.

## 25.2 Scope settings

The "Scope Settings" group box consists of several settings to adjust the behavior and appearance of the scope object.

By checking the "Large Font" check box, the weight and time values on the scope display will be displayed with a font size of 10. If unchecked the font size will be 8.

By checking the "Thin Line" check box, the size of the recorded scope graph lines will be 1 pixel wide. If unchecked, it will be 2 pixels wide.

By checking the "Dots" check box, the graph on the scope display will be displayed as dots, on positions matching the time stamp for the data received. This makes an easy way to measure the sample rate of the device, simply by counting dots on the screen.

The "Page Length" drop down box enables the user to choose the X-Axis scale time by making a time value choice from the drop-down value list.

The number of pages pr. record can be set by selecting one of the preset numbers of page values from the "Sample Pages" drop down box.

By selecting the "GN – Get Net to Scope", the net values will be showed on the scope during recording and the final values after a recording.

During recording another radio button can be selected if wanted.

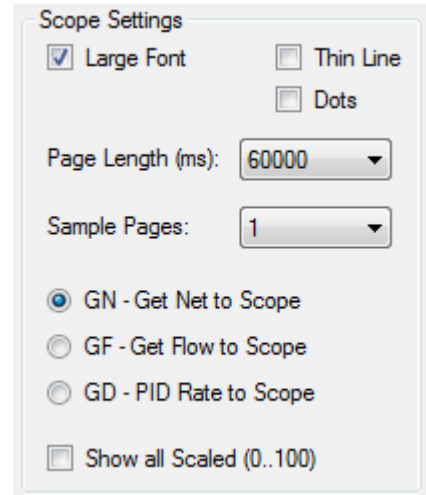
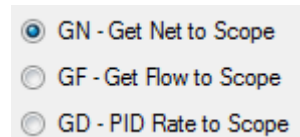
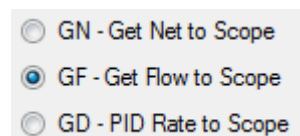
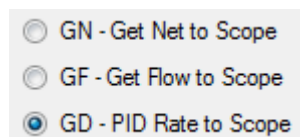
By selecting the "GF – Get Flow to Scope", the flow values will be showed on the scope during recording and the final values after a recording.

During recording another radio button can be selected if wanted.

By selecting the "GD – PID Rate to Scope", the PID rate values will be showed on the scope during recording and the final values after a recording.

During recording another radio button can be selected if wanted.

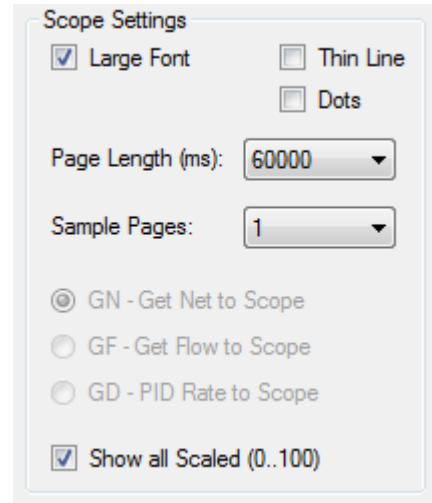
All three values are stored locally during recording, so after the end of a recording, the different recorded values can be shown on the scope one at the time by selecting the radio button representing the values to be shown.

By checking the "Show all Scaled (0..100)" checkbox, all of the three graphs can be seen on the scope in a scaled format so the minimum value of the graphs is 0 and the maximum value is 100. The actual values of the measurements can only be seen by watching the 3 graphs one by one.

It's not possible to do a recording showing all the graphs at the same time while the recording is ongoing, as the scaling can only be performed after the end of a data recording where the total minimum and maximum values can be calculated.

See an example of a "Show All Scaled" in a later section.



Scope Settings

☒ Large Font      ☐ Thin Line

☐ Dots

Page Length (ms): 60000

Sample Pages: 1

☒ GN - Get Net to Scope

☐ GF - Get Flow to Scope

☐ GD - PID Rate to Scope

☒ Show all Scaled (0..100)

## 25.3 Mass Flow Parameters

In the "Mass Flow Parameters" group box most of the parameters from the mass flow commands group are represented for easy access when trimming of mass flow parameters are necessary during adjustment and setup of a mass flow process.

### 25.3.1 Changing Parameters

In the "Mass Flow Parameters" group box most of the parameters from the mass flow command group can be inspected and values can be changed. Simply select a parameter text field and change the value.

### 25.3.2 Write Settings

By selecting the "Write All" button, the changed mass flow parameter 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 device.

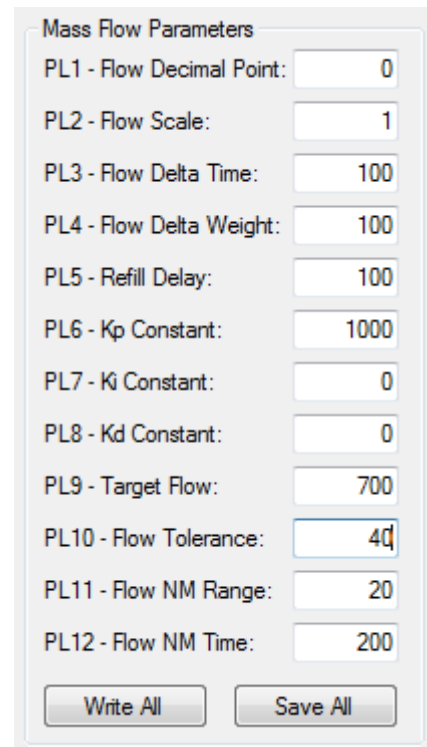
### 25.3.3 Save settings

If the changed mass flow parameter values are to be used after device power down / up, it's necessary to save the settings into the EEPROM of the device.

By selecting the "Save All" button, the changed mass flow values are saved into the EEPROM of the device.

### 25.3.4 Help on (Command)

If the user is connected to the internet, selecting the help button "Help on (Command)" will give access to help on the currently selected command text field in the "Mass Flow Parameters" group box.



Mass Flow Parameters

PL1 - Flow Decimal Point: 0

PL2 - Flow Scale: 1

PL3 - Flow Delta Time: 100

PL4 - Flow Delta Weight: 100

PL5 - Refill Delay: 100

PL6 - Kp Constant: 1000

PL7 - Ki Constant: 0

PL8 - Kd Constant: 0

PL9 - Target Flow: 700

PL10 - Flow Tolerance: 40

PL11 - Flow NM Range: 20

PL12 - Flow NM Time: 200

Write All      Save All

## 25.4 Start / Stop / Freeze Mass Flow process

When the "Mass Flow Measurement" dialog is opened the current status of the mass flow process is read and the result is reflected in the "Start / Stop" button and the "Freeze / Continue" button.

If the process is not started the buttons will be set in the state as shown in the figure on the right.



The mass flow process is started by selecting the "Start" button. The state of the buttons will be changed as shown in the figure at the right.



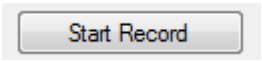
An ongoing mass flow process can be frozen by selecting the "Freeze" button. The state of the buttons will be changed as shown in the figure at the right.



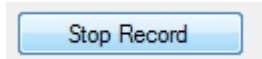
A frozen mass flow process can be continued by selecting the "Continue" button.

## 25.5 Start Record

By selecting the "Start Record" button, the three polled values "GN – Get Net", "GF – Get Flow" and "GD – PID Rate" will all at the same time be recorded from the H&B device assigned to the measurement channel and stored internally.

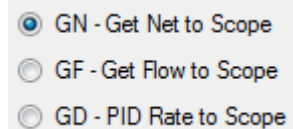


When the recording is started, the button text will change to "Stop Record". By selecting the "Stop Record" button the record will stop. The record will also automatically stop when the selected recording time is reached.

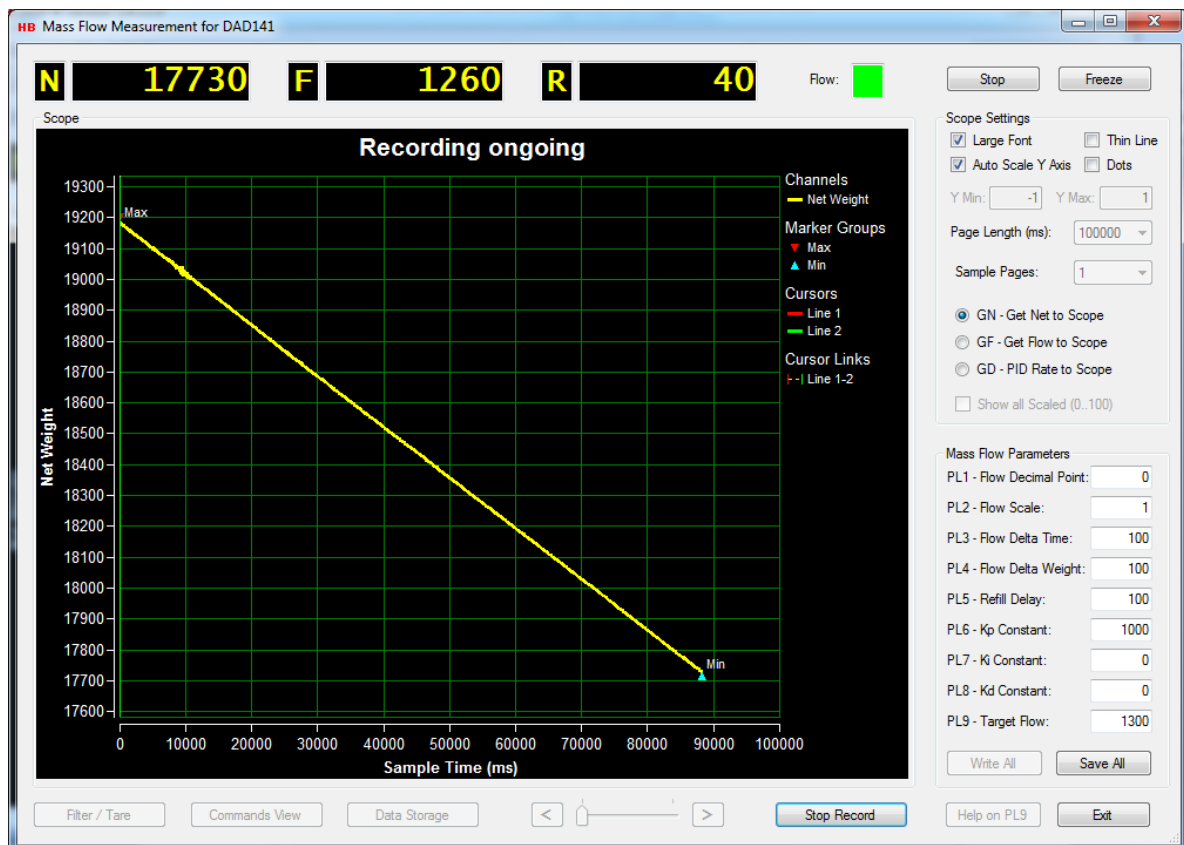


The length of the recording depends on the scope page length and the number of scope pages selected in the "Scope Settings" group box. Read the "Scope Settings" section for more details.

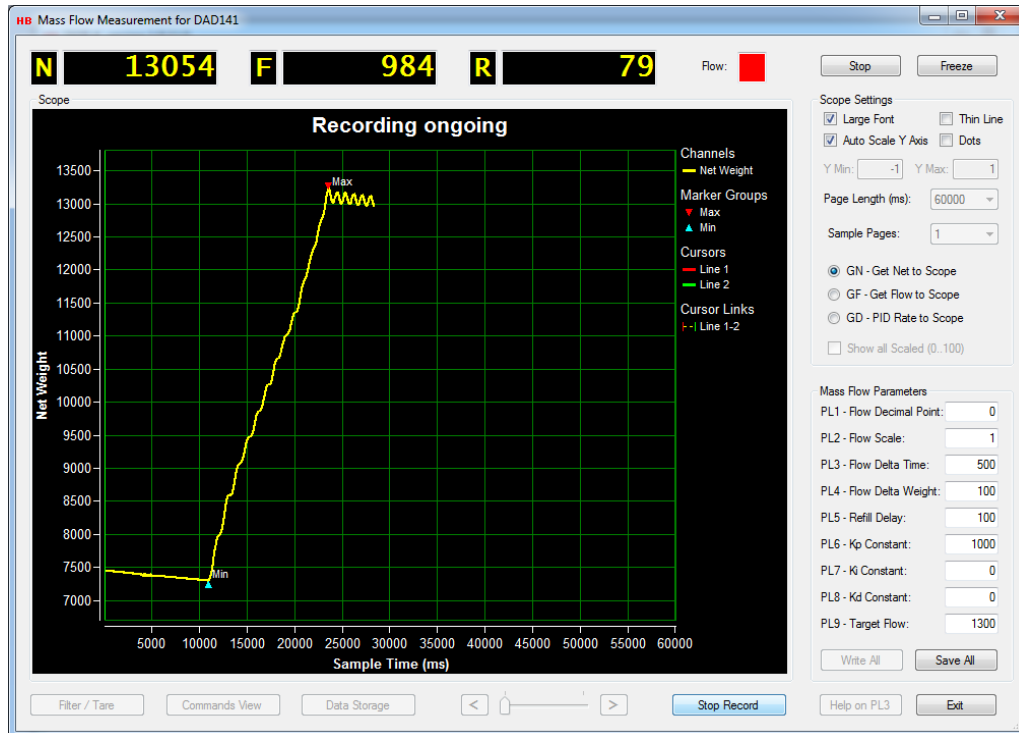
During the recording the value selected by the radio buttons in the Scope Settings group box will be shown on the scope display. The currently selected value to be shown on the scope display can during the recording be changed by selecting another radio button.



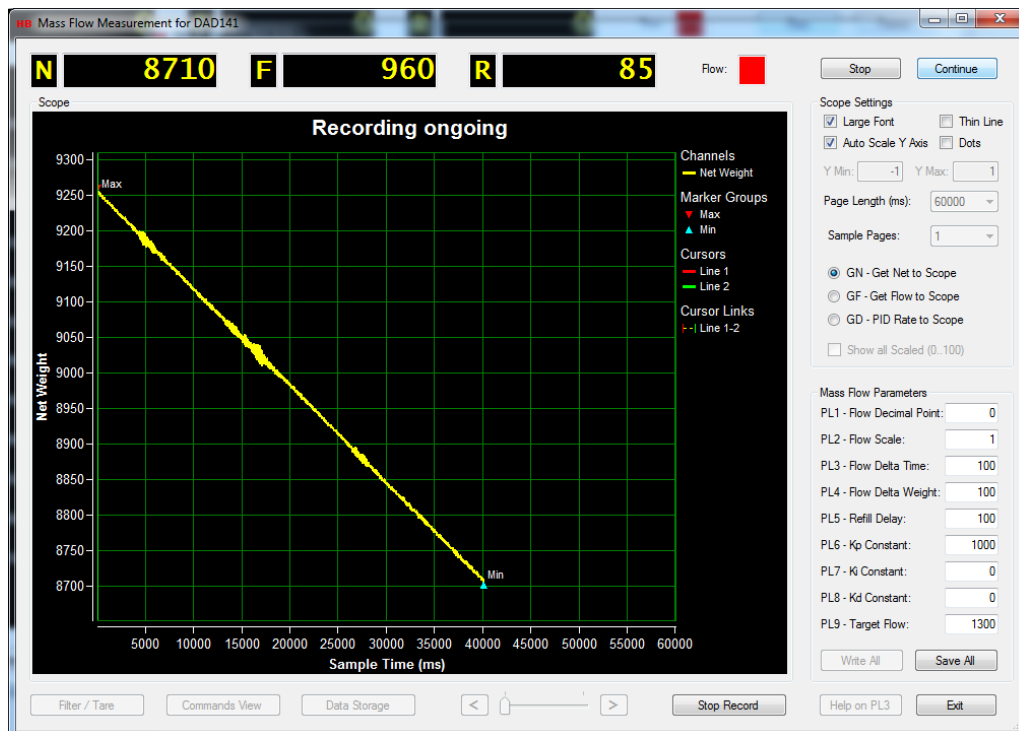
The "Flow" indicator will be green when the flow is steady ongoing as shown on the figure below.



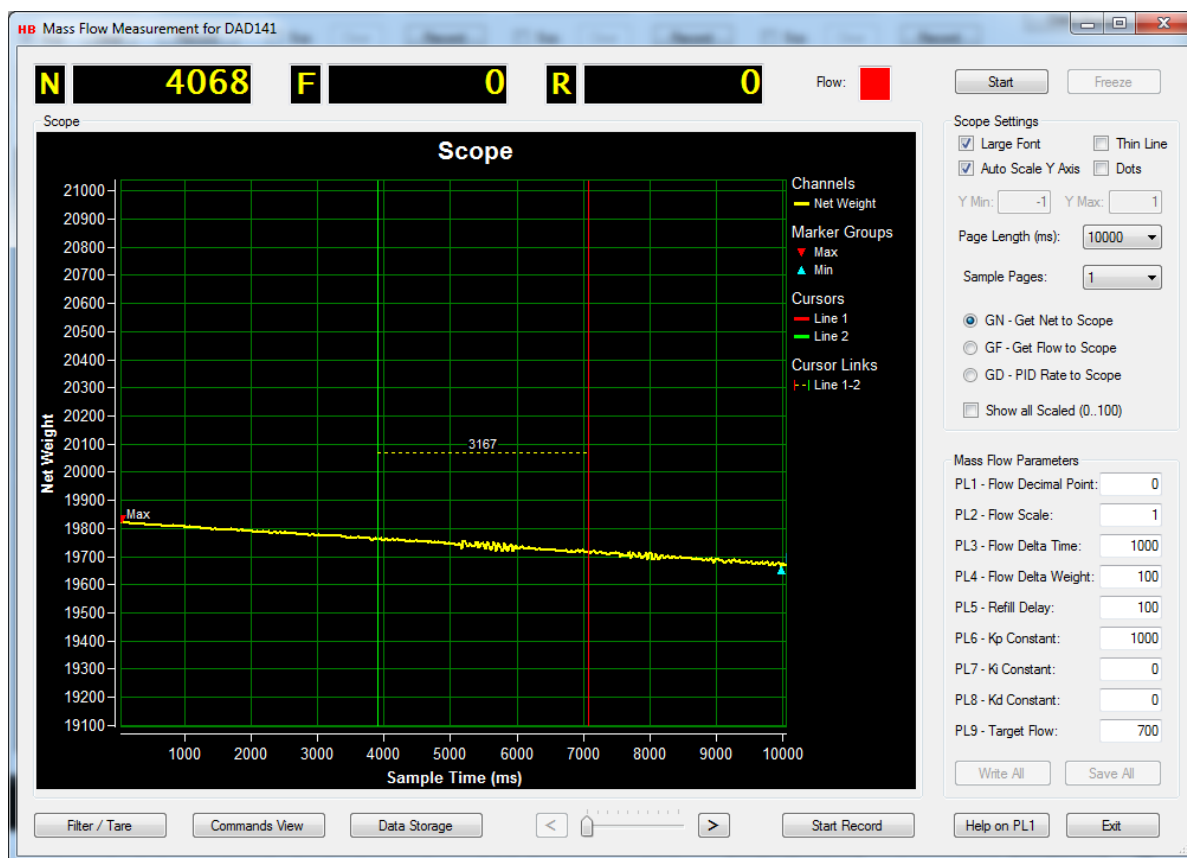
The “Flow” indicator will be red if the flow stops, or the mass source tank is being refilled as shown on the figure below.



The “Flow” indicator will be red if the flow is frozen as shown on the figure below.



## 25.6 Analyzing the measurement



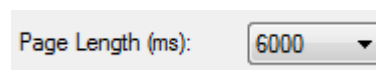
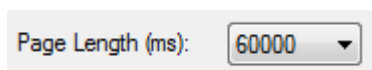
When the recording is stopped, the data recorded for the three data channels can be analyzed in detail.

As explained earlier, the current data view on the scope display, can be changed to another data channel by selecting another data source radio button in the Scope Settings group box.

Also, the red and green cursor lines can be used to mark specific areas of the scope display.

Refer to the section "Scope display Functions" for a description on how to use the red and green cursor lines.

It's possible to analyze the mass flow measurement session more detailed by decreasing the value of the page length after a measurement record.



The measurement result will then be divided into several measurement pages, which then can be analyzed in detail by using the two arrows in the bottom of the "Mass Flow Measurement" dialog.



## 25.7 Show All Scaled.

By selecting the "Show all Scaled (0..100)" check box, all of the recorded data values from the three sources will be shown in a scaled format as shown on the figure below.



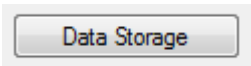
It not possible to do a new record while the "Show all Scaled (0..100)" check box is selected, as the scaling calculation only can be performed after a recording is ended.

When doing the scaling calculation for the three data sources, the minimum and maximum values for the three channels are found and from these values, the whole set of data values can for each of the three channels be scaled down or up to a range where the lowest value for each of the channels represent a 0 and the highest value for each of the three channels represents 100.

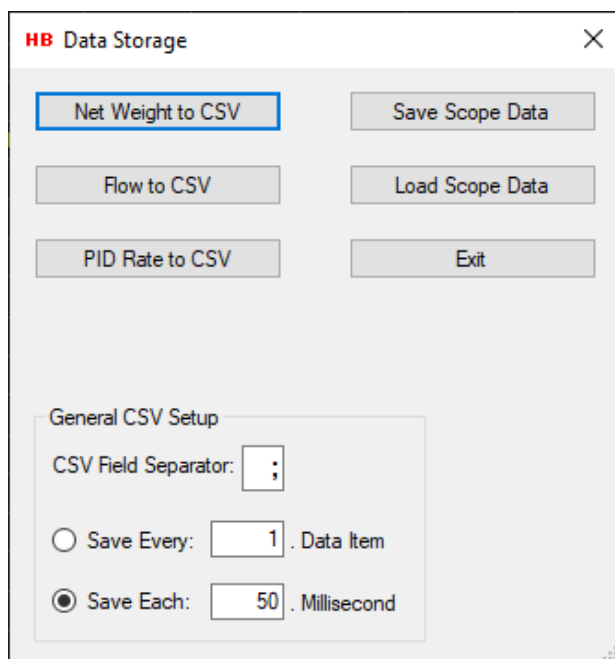
This way the user can get a composite picture of the three channel graphs at the same time.

## 25.8 Data storage

In the "Data Storage" dialog, the user can save recorded scope display data from all the 3 channels to a disk file. Not only data for the currently displayed graph on the scope will be saved but also the 2 hidden channels will be stored to a disk file.



Stored data can later be reloaded and shown by choice on the scope display



### 25.8.1 Save scope display data

All the recorded scope display data can be saved at once as a binary file by selecting the "Save Scope Data" button. The saved scope display data can then later be reloaded into the scope object in the "Mass Flow Measurement" dialog and into the main window of the DOP 4 application, for further investigation.

By selecting the "Save Scope Data" button, the binary scope data with all the recorded data values, for all 3 channels, will be saved as a binary file. A "Save File" dialog will appear, and a proper file name can be selected for the binary scope data file.

The scope display data will be saved with the extension .rsd (Recorded Stream Data)

### 25.8.2 Load scope display data

Previously saved recorded scope display data can be reloaded by selecting the "Load Scope Data" button.

By selecting the "Load Scope Data" button a "Load File" menu will appear.

By selecting a file with the extension .rsd (Recorded Stream Data) the scope object will be loaded with recorded stream data for the 3 measurements data channels.

The loaded scope display data can later again be saved as CSV data if wanted.

### 25.8.3 Save scope display data as CSV text files

Recorded scope display data can be saved channel by channel as a CSV (Comma Separated Values) text files, which can be loaded into for instance a Microsoft Excel application for further investigation.

By selecting one of the "X to CSV" buttons, the scope display data for that specific channel, will be saved as a CSV file. A "Save File" dialog will appear, and a proper file name can be selected for the CSV file. Scope display data saved as CSV files are saved with the extension .csv.

The CSV data is saved as two columns with the recorded value in the first column and the recorded time in milliseconds in the second column.

The figure shows recorded CSV data from H&B device, loaded into Microsoft Excel.

	A	B	C
1	459	0	
2	456	1,666016	
3	453	3,333008	
4	450	5	
5	447	6,666016	
6	444	8,333008	
7	441	10	
8	438	11,66602	
9	434	13,33301	
10	431	15	
11	428	16,66602	
12	424	18,33301	
13	421	20	

### 25.8.4 CSV settings

In the text field "Field Separator" the CSV field separator can be specified. By default, the separator character will be the separator character for the current country language used by the PC.

A limitation of the CSV data amount to be saved can be set in the text field "Save Every x. Data Item". If the value of the text field for instance is set to 100, only 1 out of 100 data items will be saved. One data item is saved, and the next 99 data items are skipped and so on. Set the value to 1 if all items should be saved.

A time limit can also be defined so only data matching the defined data interval (equal or nearest higher) will be saved. If "Save Each" is set to 50 milliseconds, data with the time interval of 50 milliseconds (0, 50, 100, 150 ...) will be saved.

CSV Field Separator:

☒ Save Every:  . Data Item

☐ Save Each:  . Millisecond

## 25.9 Other dialogs

Two other dialogs are available for adjusting device parameters.

The "Commands View" dialog and the "Filter / Tare" dialog are explained in another section, so it will not be explained in this section.

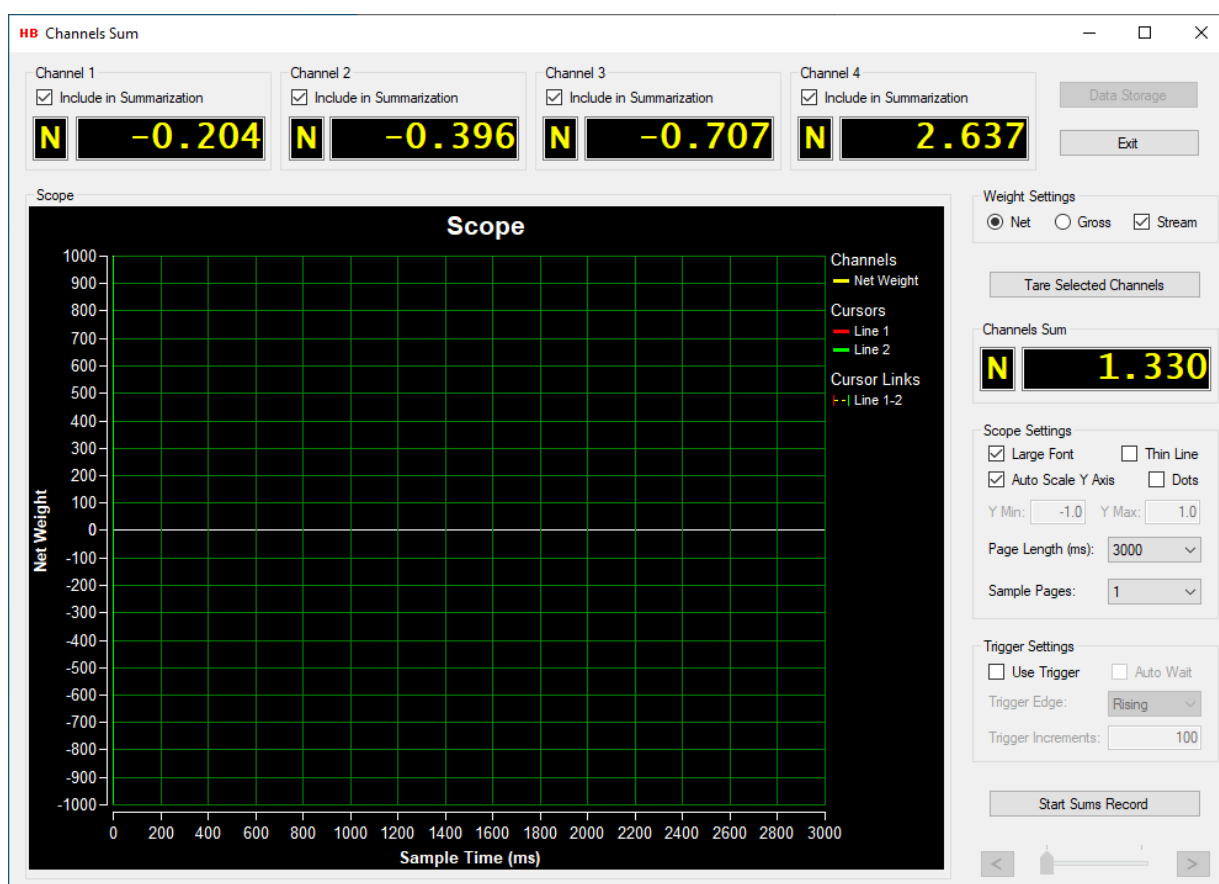
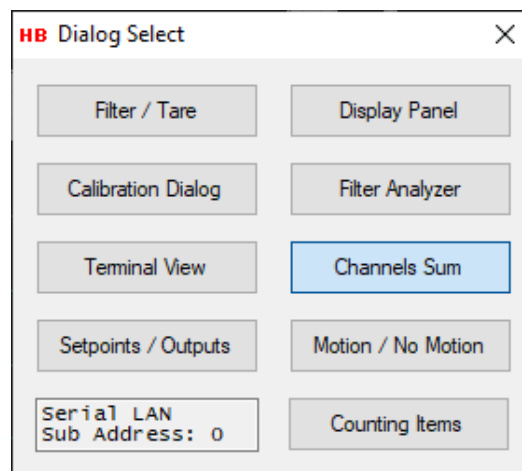
## 26 Channels Sum

By selecting the "Channels Sum" button in the popup menu "Dialog Select" as explained in the section covering "Dialog Shortcuts", the "Channels Sum" dialog will be opened.

From the "Channels Sum" dialog the summarized weight sum of up to 4 channels can be recorded by selecting the "Start Sums Record" button.

The channels to be summarized are selected by checking the "Include in Summarization" field.

The result of the summarization can be seen real time in the "Channels Sum" weight field.



## 26.1 Weight value displays

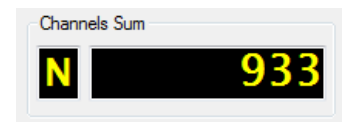
In the top of the "Channels Sum" dialog the weight values from up to 4 channels are displayed. By checking or unchecking the "Include in Summarization" fields the channels to be included in the summarization can be selected.

Channels to be included can also be selected from the Main menu.



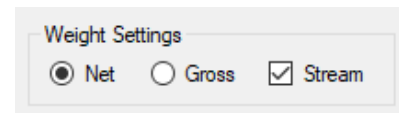
Channel 1	Channel 2	Channel 3	Channel 4
<input checked="" type="checkbox"/> Include in Summarization	<input checked="" type="checkbox"/> Include in Summarization	<input checked="" type="checkbox"/> Include in Summarization	<input checked="" type="checkbox"/> Include in Summarization
N 452	N 9	N 20	N 452

The resulting summarization can be seen in the "Channels Sum" weight display.



Channels Sum
N 933

From the "Weight Settings" group box, it can be controlled if weight values are to be displayed as net or gross values by selecting the appropriate radio button.



Weight Settings
<input checked="" type="radio"/> Net <input type="radio"/> Gross <input checked="" type="checkbox"/> Stream

The selected net / gross setting is common for all the four channel displays.

From the "Weight Settings" group box, it's also controlled if data from the selected devices should be streamed or polled.

If data is polled, it's not possible to do recordings to the scope. This can only be done in streaming mode.

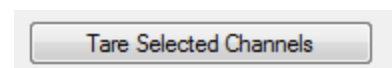
Only devices having full duplex ASCII interface, Serial LAN interface or CANOpen interface can have their data recorded to the scope.

All selected devices must be equal and have the same filter settings to be able to do data recording to the scope.

In poll mode where data recording to the scope is not possible, the selected devices don't have to be equal or having the same filter settings.

## 26.2 Tare Selected Channels

By selecting the "Tare Selected Channels" all the selected devices will be tarred. This way up to 4 devices can be tarred at once by easy access from the main menu.



Tare Selected Channels
------------------------

## 26.3 Scope settings

The "Scope Settings" group box consists of several settings to adjust the behavior and appearance of the scope object.

By checking the "Large Font" check box, the weight and time values on the scope display will be displayed with a font size of 10. If unchecked, the font size will be 8.

By checking the "Thin Line" check box, the size of the recorded scope graph lines will be 1 pixel wide. If unchecked, it will be 2 pixels wide.

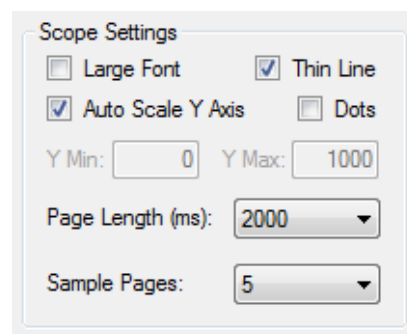
By checking the "Dots" check box, the graph on the scope display will be displayed as dots, on positions matching the time stamp for the data received. This makes an easy way to measure the sample rate of the device, simply by counting dots on the screen.

By checking the "Auto Scale Y Axis" check box, the weight scale on the Y-Axis of the scope display is calculated automatic.

If unchecked, the "Y Max" and "Y Min" text fields are enabled, and the user can enter some fixed Y-Axis scale values at choice.

The "Page Length" drop down box enables the user to choose the X-Axis scale time by making a time value choice from the drop-down value list.

The number of pages pr. record can be set by selecting one of the preset numbers of page values from the "Sample Pages" drop down box.



## 26.4 Trigger Settings

In the "Trigger Settings" group box, the set up for waiting for a specific trigger level to be reached before a scheduled summarized recoding should start can be set.

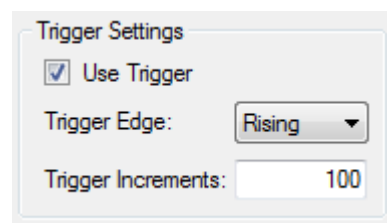
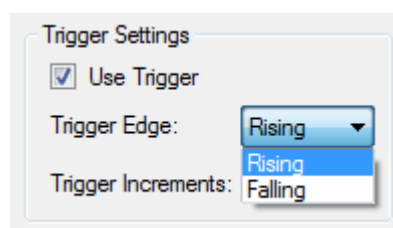
By checking the "Use Trigger" check box, a scheduled recording ("Start Sums Record" button selected) will not start the actual recording to the scope display before the increments value of the "Trigger Increments" text field is reached by increasing or decreasing the weight value in the "Channels Sum" field.

The increments value is the weight value to be reached without the decimal point. So, 0.200 and 2.00 equals both 200 increments.

Both negative and positive integer values can be entered to the "Trigger Increments" field.

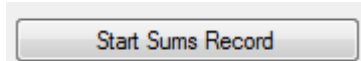
By selecting "Rising" from the "Trigger Edge" drop down box, the recording will start when the increments value is reached from a value lower than the increments value.

By selecting "Falling" from the "Trigger Edge" drop down box, the recording will start when the increments value is reached from a value higher than the increments value.

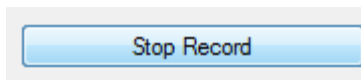



## 26.5 Start Sums Record

By selecting the "Start Sums Record" button the current summarized weight value of the selected channels will be recorded and showed as a resulting graph in the scope display.



The "Start Sums Record" button will have its text changed to "Stop Record". By selecting the button at this stage, the ongoing recording will be canceled.

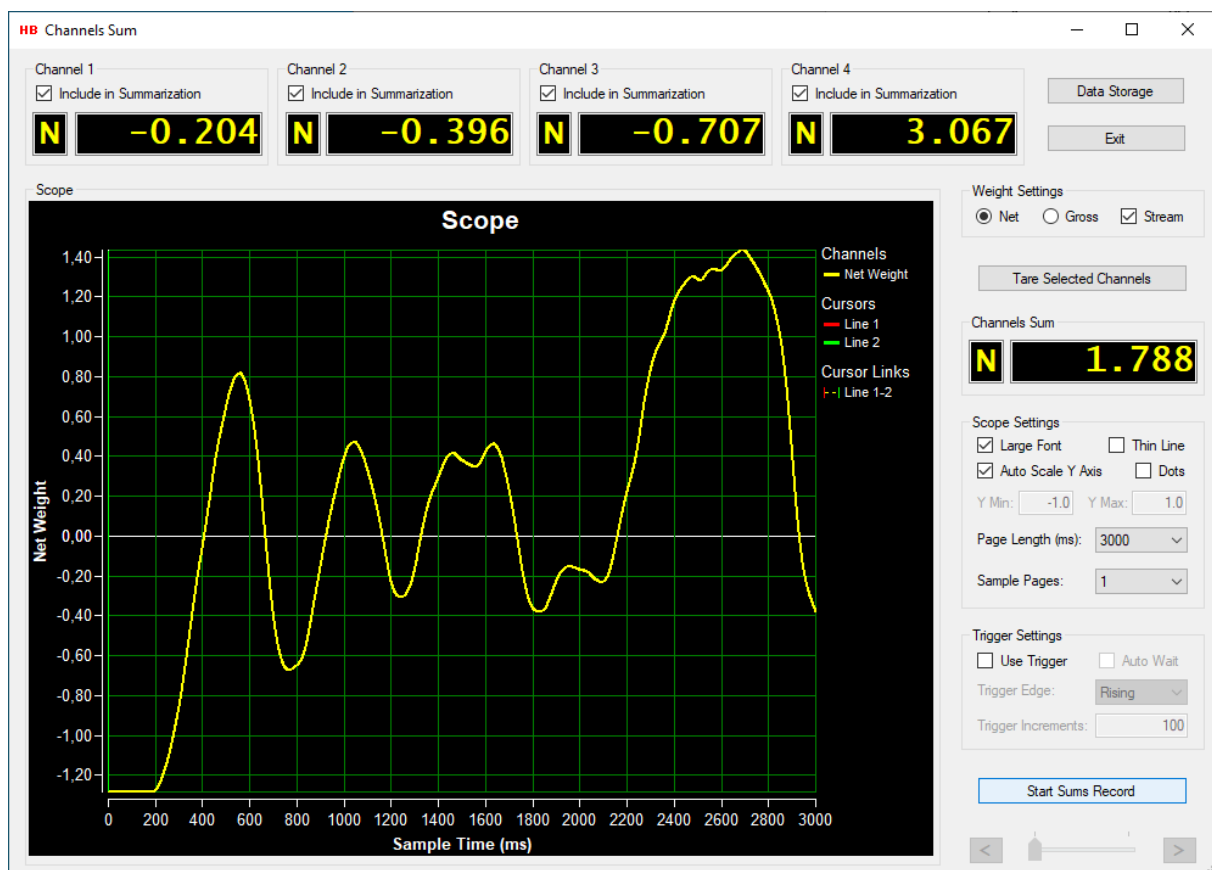


If waiting for a trigger value to be reached, the scheduled recording can this way be aborted by selecting the "Stop Record" button.

If the "Use Trigger" checkbox is checked, the summarized weight recording will not start before the increments value of the "Trigger Increments" text field is reached by increasing or decreasing the weight value in the "Channels Sum" field as explained earlier.

The length of the recording depends on the scope page length and the number of scope pages selected in the "Scope Settings" group box. Read the "Scope Settings" section for more details.

The figure below shows an example of a summarized weights recording.

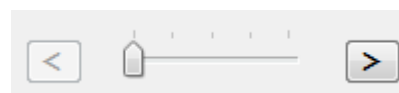


## 26.6 Detailing the analyzing

It's possible to analyze the recorded graph more detailed by decreasing the value of the page length after a recording.

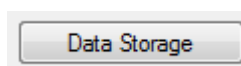


The measurement result will then be divided into several measurement pages, which then can be analyzed in detail by using the two arrows in the bottom of the "Channels Sum" dialog.



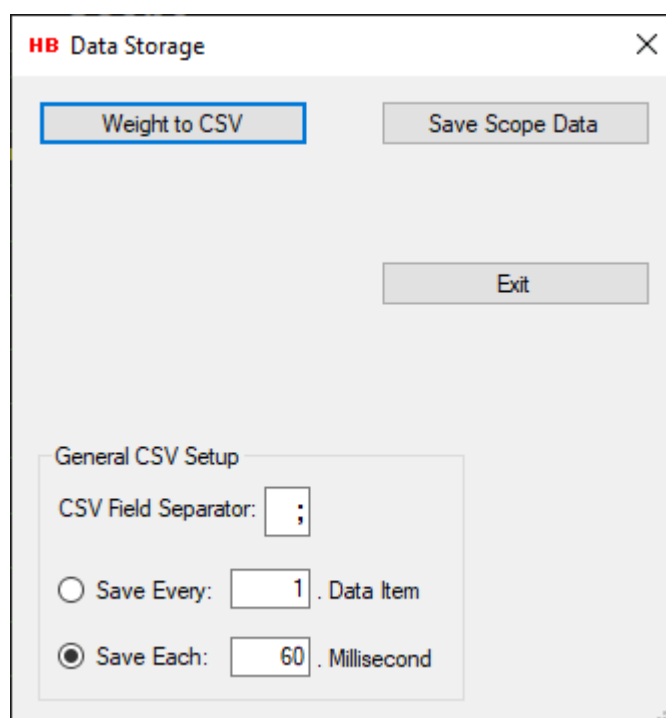
## 26.7 Data storage

By selecting the "Data Storage" button, the "Data Storage" dialog will be opened. The "Data Storage" dialog will be explained in detail in this section.



From the "Data Storage" dialog the user can save recorded scope display data from the scope display to a disk file.

The stored measurement data must be reloaded in the main window for later analyzing.



### 26.7.1 Save scope display data as binary

The recorded scope display data can be saved as a binary file by selecting the "Save Scope Data" button. The saved scope display data can then later be reloaded into the scope object in the main window of the DOP 4 application, for further investigation.

By selecting the "Save Scope Data" button, the binary scope data currently appearing on the scope will be saved as a binary file. A "Save File" dialog will appear, and a proper file name can be selected for the binary scope display data file.

The scope display data will be saved with the extension .rsd (Recorded Stream Data).

### 26.7.2 Save scope display data as CSV text files

Recorded scope display data can be saved as a CSV (Comma Separated Values) text files, which can be loaded into for instance a Microsoft Excel application for further investigation.

By selecting the "Weight to CSV" button, the scope display data, will be saved as a CSV file.

The CSV data is saved as two columns with the scale weight in the first column and the recorded time in milliseconds in the second column.

The figure shows recorded CSV data from H&B device, loaded into Microsoft Excel.

	A	B	C
1	459	0	
2	456	1,666016	
3	453	3,333008	
4	450	5	
5	447	6,666016	
6	444	8,333008	
7	441	10	
8	438	11,66602	
9	434	13,33301	
10	431	15	
11	428	16,66602	
12	424	18,33301	
13	421	20	

### 26.7.3 CSV Settings

In the text field "Field Separator" the CSV field separator can be specified. By default, the separator character will be the separator character for the current country language used by the PC.

A limitation of the CSV data amount to be saved can be set in the text field "Save Every x. Data Item". If the value of the text field for instance is set to 100, only 1 out of 100 data items will be saved. One data item is saved, and the next 99 data items are skipped and so on. Set the value to 1 if all items should be saved.

A time limit can also be defined so only data matching the defined data interval (equal or nearest higher) will be saved. If "Save Each" is set to 50 milliseconds, data with the time interval of 50 milliseconds (0, 50, 100, 150 ...) will be saved.

CSV Field Separator:

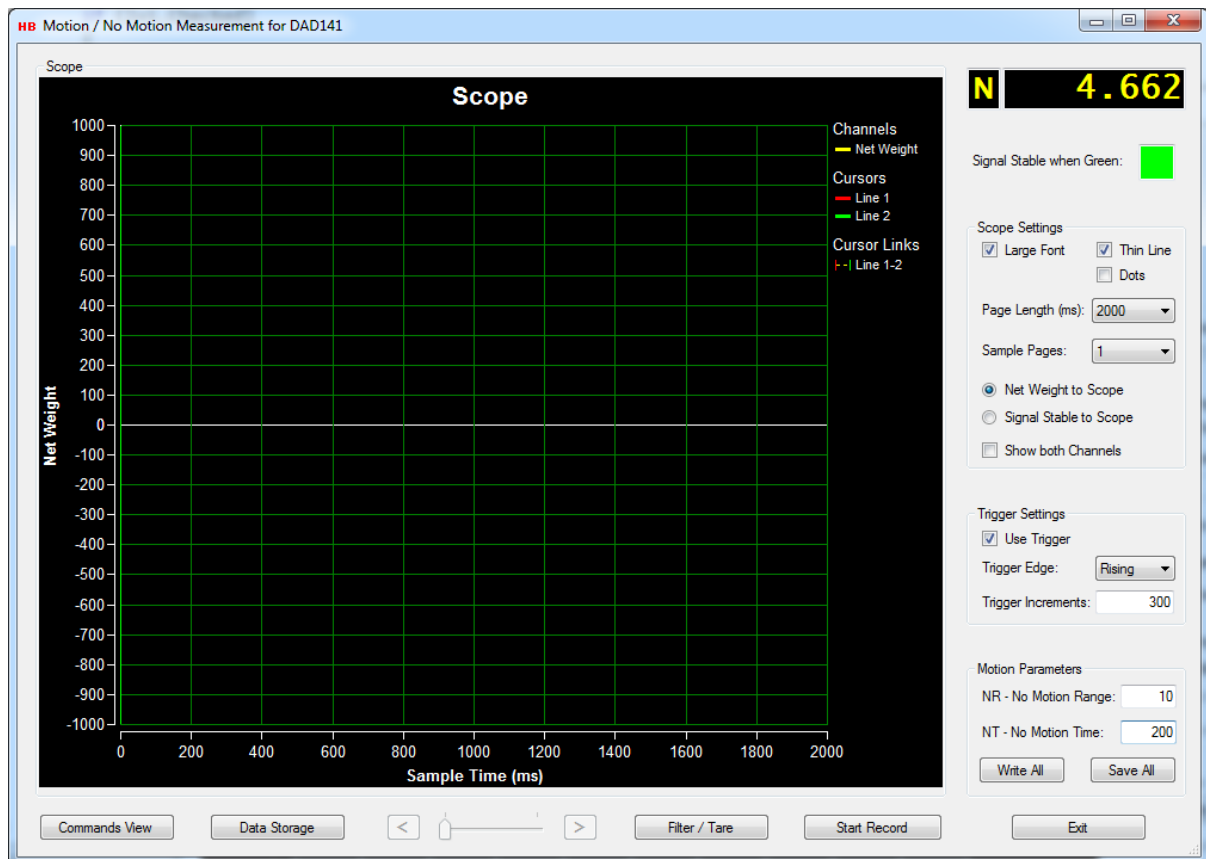
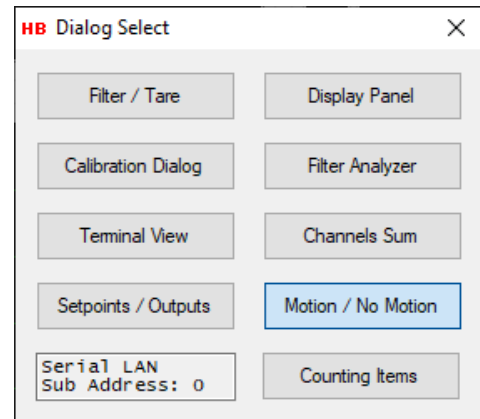
☒ Save Every:  . Data Item

☐ Save Each:  . Millisecond

## 27 Motion / No Motion Measurement

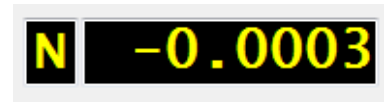
By selecting the "Motion / No Motion" button in the popup menu "Dialog Select" as explained in the section covering "Dialog Shortcuts", the "Motion / No Motion Measurement" dialog will be opened.

From the "Motion / No Motion Measurement" dialog the status of the "Signal stable" indicator can be recorded together with the connected net weight value by selecting the "Start Record" button.



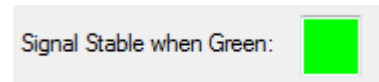
## 27.1 Weight value displays

In the top right corner of the dialog there is a weight value display located showing the actual net weight from the load cell.

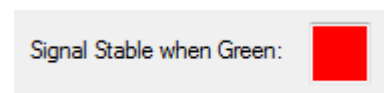


The "Filter / Tare" dialog for the current device can be accessed by clicking on the weight value display.

The "Signal Stable when Green" indicator shows the status of the signal stable indicator. If the color is green the motion of the load cell is within the range indicated by the "NR – No Motion Range" and "NT – No Motion Time" parameter.



If the color of the "Signal Stable when Green" indicator is red, the motion of the load cell is outside the range indicated by the "NR – No Motion Range" and "NT – No Motion Time" parameter.



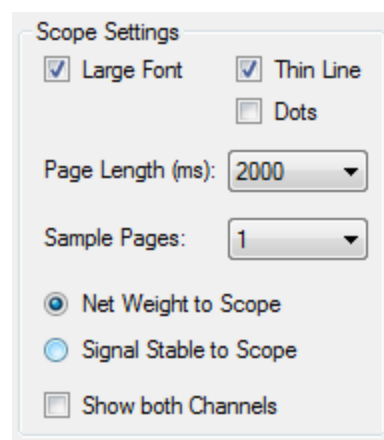
## 27.2 Scope settings

The "Scope Settings" group box consists of several settings to adjust the behavior and appearance of the scope object.

By checking the "Large Font" check box, the weight and time values on the scope display will be displayed with a font size of 10. If unchecked the font size will be 8.

By checking the "Thin Line" check box, the size of the recorded scope graph lines will be 1 pixel wide. If unchecked, it will be 2 pixels wide.

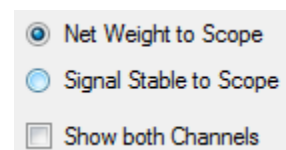
By checking the "Dots" check box, the graph on the scope display will be displayed as dots, on positions matching the time stamp for the data received. This makes an easy way to measure the sample rate of the device, simply by counting dots on the screen.



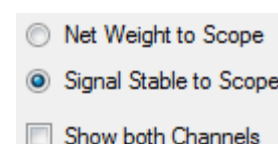
The "Page Length" drop down box enables the user to choose the X-Axis scale time by making a time value choice from the drop-down value list.

The number of pages pr. record can be set by selecting one of the preset numbers of page values from the "Sample Pages" drop down box.

By selecting the "Net Weight to Scope", the actual net values will be showed on the scope during recording and the final net values after a recording.

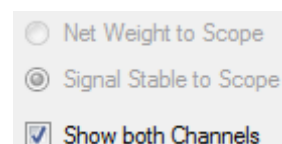


By selecting the "Signal Stable to Scope", the signal stable indicator on / off values will be showed as 0 and 1 on the scope during recording and the final signal stable values after a recording.



Both net values and signal stable values are stored at the same locally during recording, so after the end of a recording, the different recorded values can be shown on the scope one at the time by selecting the radio button representing the values to be shown.

By checking the "Show both Channels" checkbox, both two graphs can be seen on the scope using the net weight values as common scale.



It's not possible to do a recording showing both graphs at the same time while the recording is ongoing, as the scaling of the signal stable values can only be performed after the end of a data recording where the total minimum and maximum net weight values can be calculated.

See an example of a "Show both Channels" in a later section.

## 27.3 Trigger Settings

In the "Trigger Settings" group box, the set up for waiting for a specific trigger level to be reached before a scheduled recoding should start can be set.

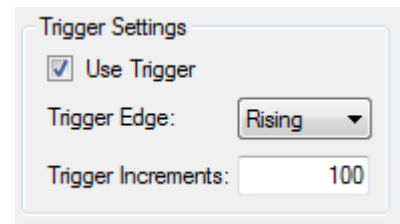
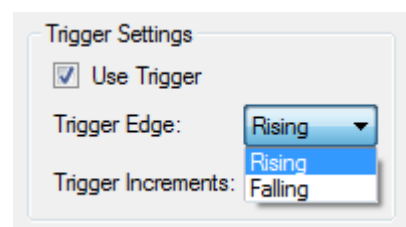
By checking the "Use Trigger" check box, a scheduled recording ("Start Record" button selected) will not start the actual recording to the scope display before the increments value of the "Trigger Increments" text field is reached by increasing or decreasing the weight on the scale.

The increments value is the weight value to be reached without the decimal point. So, 0.200 and 2.00 equals both 200 increments.

Both negative and positive integer values can be entered to the "Trigger Increments" field.

By selecting "Rising" from the "Trigger Edge" drop down box, the recording will start when the increments value is reached from a value lower than the increments value.

By selecting "Falling" from the "Trigger Edge" drop down box, the recording will start when the increments value is reached from a value higher than the increments value.

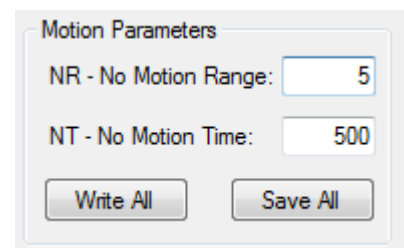



## 27.4 Motion Parameters

In the "Motion Parameters" group box, the parameters from the motion commands group are represented for easy access when trimming of motion parameters are necessary.

### 27.4.1 Changing Parameters

In the "Motion Parameters" group box, the parameters from the motion command group can be inspected and values can be changed. Simply select a parameter text field and change the value.



### 27.4.2 Write Settings

By selecting the "Write All" button, the changed motion parameter 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 device.

### 27.4.3 Save settings

If the changed motion parameter values are to be used after device power down / up, it's necessary to save the settings into the EEPROM of the device.

By selecting the "Save All" button, the changed motion values are saved into the EEPROM of the device.

## 27.5 Start Record

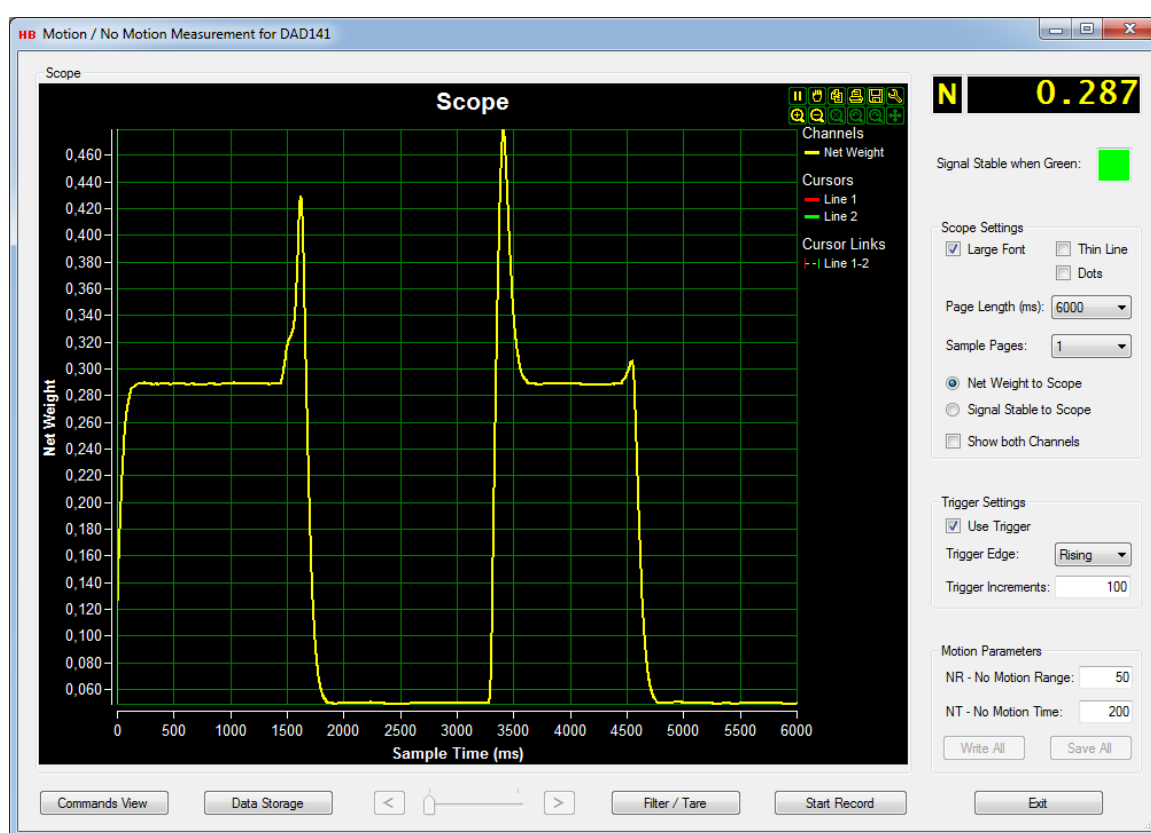
By selecting the "Start Record" button, the two streamed real time values "Net Weight" and "Motion / No Motion" values will both at the same time be recorded from the H&B device assigned to the measurement channel and stored internally.

Start Record

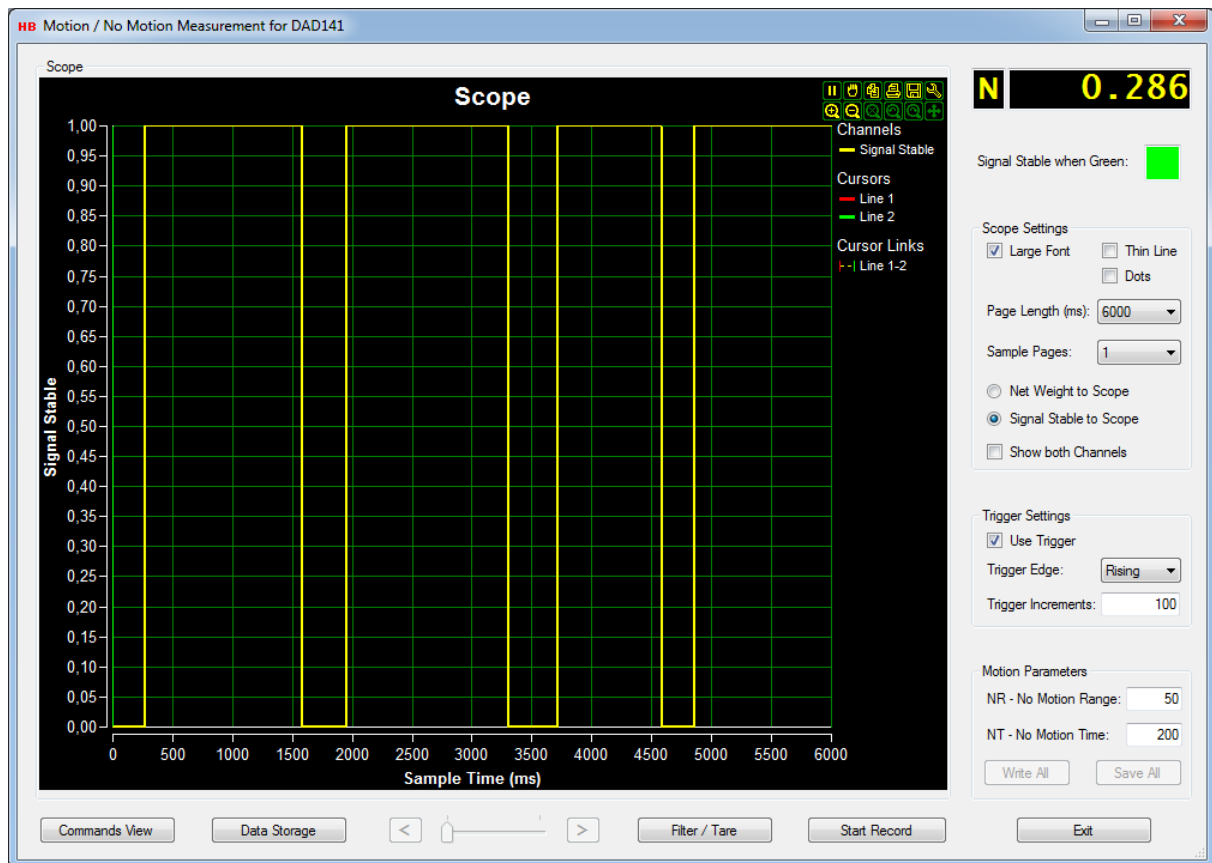
When the recording is started, the button text will change to "Stop Record". By selecting the "Stop Record" button the record will stop. The record will also automatically stop when the selected recording time is reached.

Stop Record

The length of the recording depends on the scope page length and the number of scope pages selected in the "Scope Settings" group box. Read the "Scope Settings" section for more details.



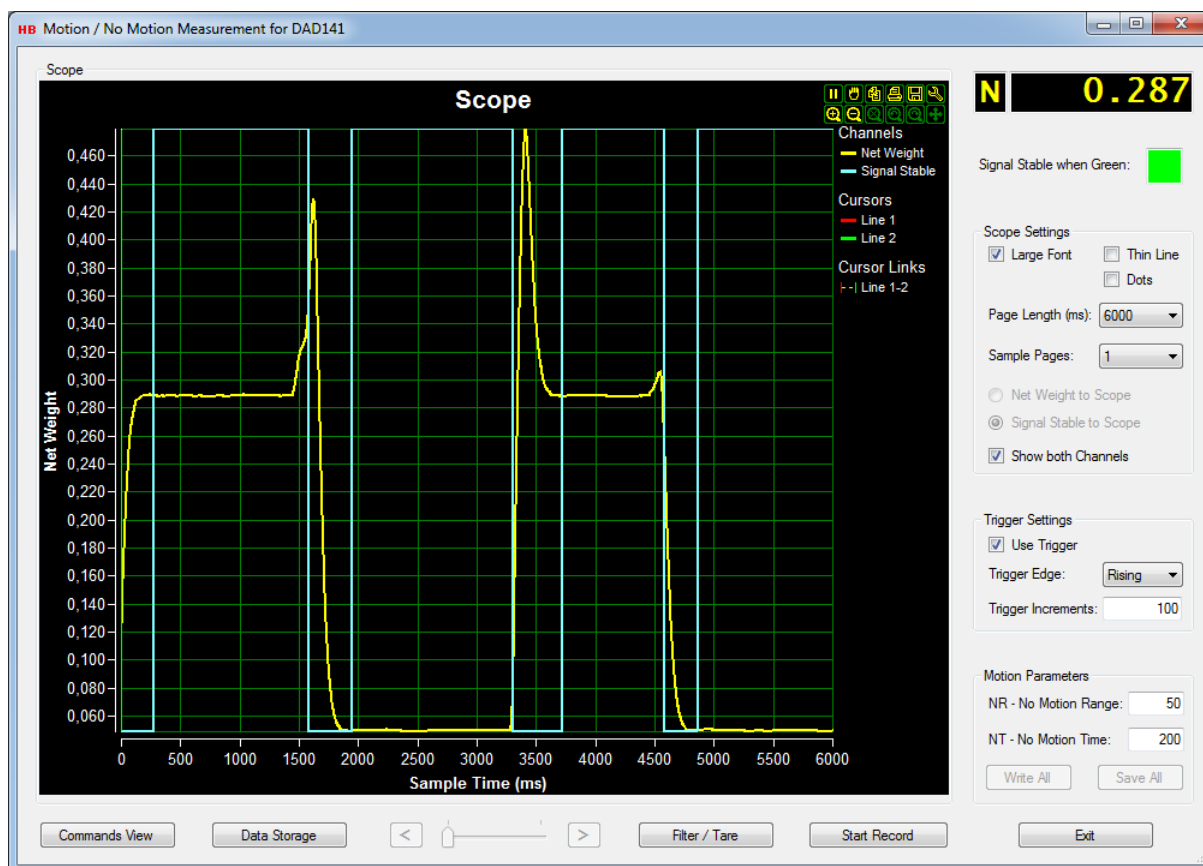
The figure above shows the net weight result after a recording.



The figure above shows the signal stable indicator result after a recording.

## 27.6 Show both Channels

By selecting the “Show both Channels” check box, the recorded data values from the two sources will be shown in a scaled format as shown on the figure below.

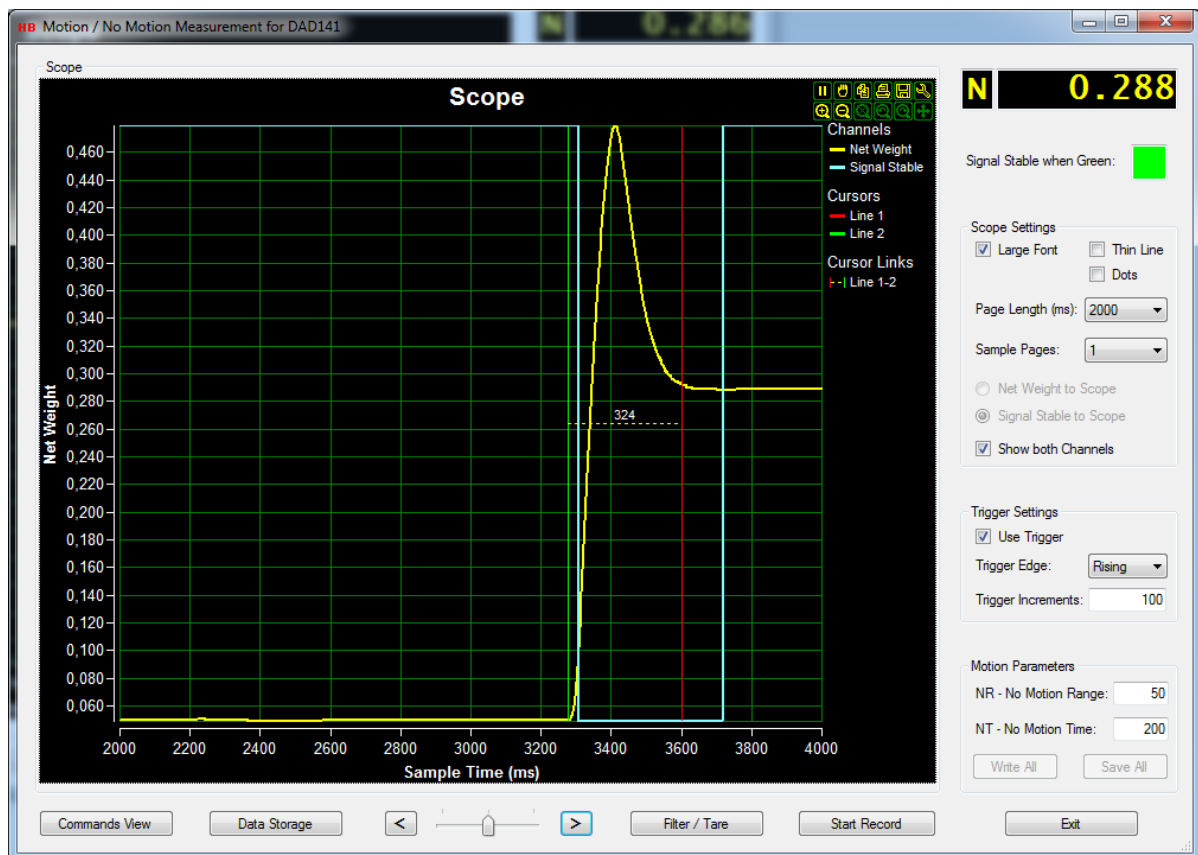


It's not possible to do a new record while the “Show both Channels” check box is selected, as the scaling calculation only can be performed after a recording is ended.

When doing the scaling calculation for the two data sources, the minimum and maximum values for the two channels are found from the net weight values recorded.

This way the user can get a composite picture of the two channel graphs at the same time.

## 27.7 Analyzing the measurement



When the recording is stopped, the data recorded for the two data channels can be analyzed in detail.

As explained earlier, the current data view on the scope display, can be changed to another data channel by selecting another data source radio button in the Scope Settings group box.

Also, the red and green cursor lines can be used to mark specific areas of the scope display.

Refer to the section "Scope display Functions" for a description on how to use the red and green cursor lines.

It's possible to analyze the "Motion / No Motion Measurement" session more detailed by decreasing the value of the page length after a measurement record.

Page Length (ms): 6000

Page Length (ms): 2000

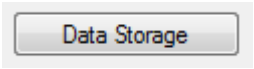
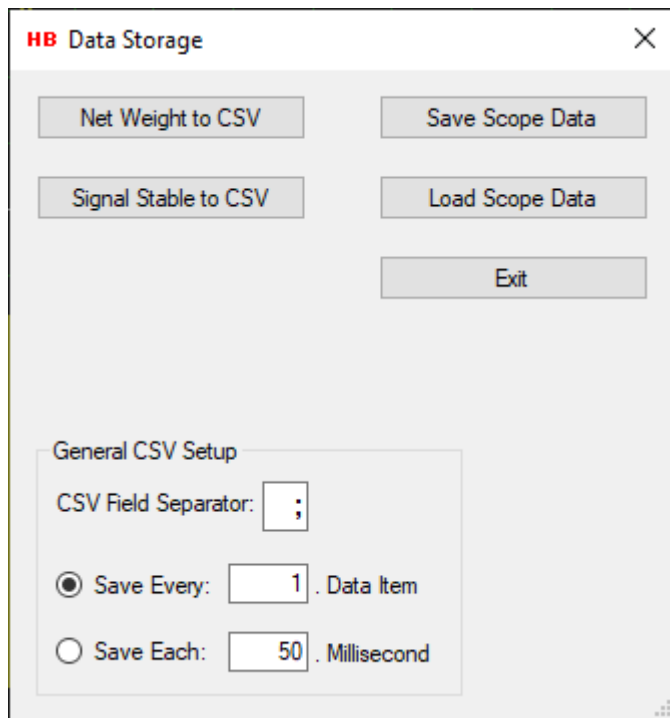
The measurement result will then be divided into several measurement pages, which then can be analyzed in detail by using the two arrows in the bottom of the "Motion / No Motion Measurement" dialog.



## 27.8 Data storage

In the "Data Storage" dialog, the user can save the recorded scope display data from both two channels to a disk file. Not only data for the currently displayed graph on the scope will be saved but also the hidden channel will be stored to a disk file.

Stored scope data can later be reloaded and shown by choice on the scope display

### 27.8.1 Save scope display data

All the recorded scope display data can be saved at once as a binary file by selecting the "Save Scope Data" button. The saved scope display data can then later be reloaded into the scope object in the "Motion / No Motion Measurement" dialog and be reloaded into the main window of the DOP 4 application, for further investigation.

By selecting the "Save Scope Data" button, the binary scope data with all the recorded data values, for both channels, will be saved as a binary file. A "Save File" dialog will appear, and a proper file name can be selected for the binary scope data file.

The scope display data will be saved with the extension .rsd (Recorded Stream Data)

### 27.8.2 Load scope display data

Previously saved recorded scope display data can be reloaded by selecting the "Load Scope Data" button.

By selecting the "Load Scope Data" button a "Load File" menu will appear.

By selecting a file with the extension .rsd (Recorded Stream Data) the scope object will be loaded with recorded stream data for the two measurements data channels.

The loaded scope display data can later again be saved as CSV data if wanted.

### 27.8.3 Save scope display data as CSV text files

Recorded scope display data can be saved channel by channel as a CSV (Comma Separated Values) text files, which can be loaded into for instance a Microsoft Excel application for further investigation.

By selecting the "Net Weight to CSV" or the "Signal Stable to CSV" button, the scope display data for that specific channel, will be saved as a CSV file. A "Save File" dialog will appear, and a proper file name can be selected for the CSV file. Scope display data saved as CSV files are saved with the extension .csv.

The CSV data is saved as two columns with the recorded value in the first column and the recorded time in milliseconds in the second column.

The figure shows recorded CSV data from H&B device, loaded into Microsoft Excel.

	A	B	C
1	459	0	
2	456	1,666016	
3	453	3,333008	
4	450	5	
5	447	6,666016	
6	444	8,333008	
7	441	10	
8	438	11,66602	
9	434	13,33301	
10	431	15	
11	428	16,66602	
12	424	18,33301	
13	421	20	

### 27.8.4 CSV settings

In the text field "Field Separator" the CSV field separator can be specified. By default, the separator character will be the separator character for the current country language used by the PC.

A limitation of the CSV data amount to be saved can be set in the text field "Save Every x. Data Item". If the value of the text field for instance is set to 100, only 1 out of 100 data items will be saved. One data item is saved, and the next 99 data items are skipped and so on. Set the value to 1 if all items should be saved.

A time limit can also be defined so only data matching the defined data interval (equal or nearest higher) will be saved. If "Save Each" is set to 50 milliseconds, data with the time interval of 50 milliseconds (0, 50, 100, 150 ...) will be saved.

CSV Field Separator:

☒ Save Every:  . Data Item

☐ Save Each:  . Millisecond

## 27.9 Other dialogs

Two other dialogs are available for adjusting device parameters.

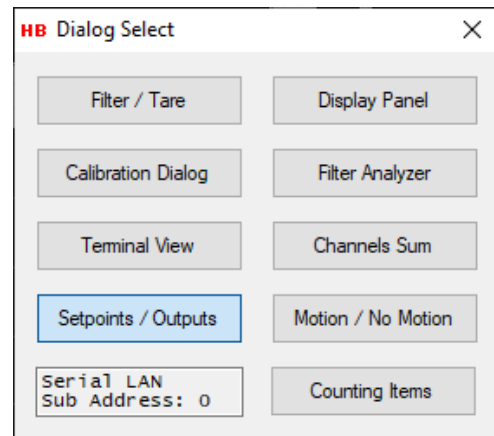
The "Commands View" dialog and the "Filter / Tare" dialog are explained in another section, so it will not be explained in this section.

## 28 Setpoints / Outputs Measurement

By selecting the "Setpoints / Outputs" button in the popup menu "Dialog Select" as explained in the section covering "Dialog Shortcuts", the "Setpoints / Outputs Measurement" dialog will be opened.

From the "Setpoints / Outputs Measurement" dialog the high / low status of the output signals can be recorded together with the connected weight value by selecting the "Start Record" button.

For the LDM64, only 2 out of the 4 output channels are available due to limitations in the SW command which are used to collect the weight and output data.



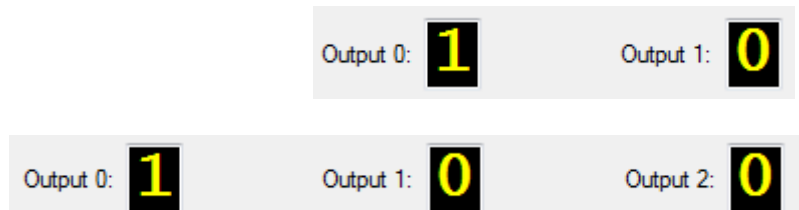
## 28.1 Weight value displays

In the top right corner of the dialog there is a weight value display located showing the actual weight from the load cell.



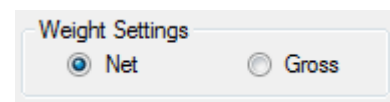
The "Filter / Tare" dialog for the current device can be accessed by clicking on the weight value display.

The status of the output signals is shown real time in the two or three output status fields. The number of output fields depends on how many output channels the connected device supports.



A "0" in the field indicates that the output value is low and a "1" that the output value is high.

From the "Weight Settings" group box, it can be controlled if weight values are to be displayed as net or gross values by selecting the appropriate radio button.



## 28.2 Scope settings

The "Scope Settings" group box consists of several settings to adjust the behavior and appearance of the scope object.

By checking the "Large Font" check box, the weight and time values on the scope display will be displayed with a font size of 10. If unchecked, the font size will be 8.

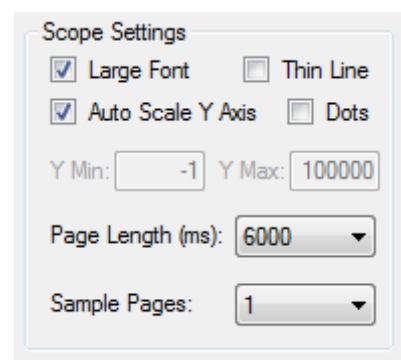
By checking the "Thin Line" check box, the size of the recorded scope graph lines will be 1 pixel wide. If unchecked, it will be 2 pixels wide.

By checking the "Dots" check box, the graphs on the scope display will be displayed as dots, on positions matching the time stamp for the data received. This makes an easy way to measure the sample rate of the device, simply by counting dots on the screen.

By checking the "Auto Scale Y Axis" check box, the weight scale on the Y-Axis of the scope display is calculated automatic. If unchecked, the "Y Max" and "Y Min" text fields are enabled, and the user can enter some fixed Y-Axis scale values at choice.

The "Page Length" drop down box enables the user to choose the X-Axis scale time by making a time value choice from the drop-down value list.

The number of pages pr. record can be set by selecting one of the preset numbers of page values from the "Sample Pages" drop down box.



## 28.3 Trigger Settings

In the "Trigger Settings" group box, the set up for waiting for a specific trigger level to be reached before a scheduled recording should start can be set.

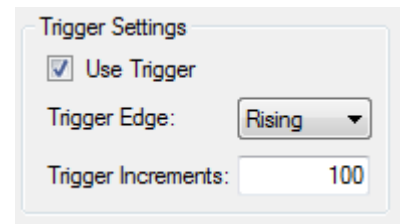
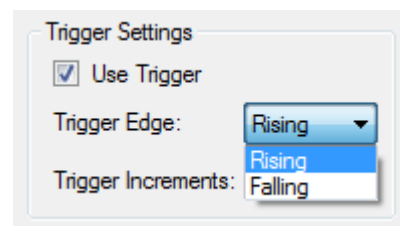
By checking the "Use Trigger" check box, a scheduled recording ("Start Record" button selected) will not start the actual recording to the scope display before the increments value of the "Trigger Increments" text field is reached by increasing or decreasing the weight on the scale.

The increments value is the weight value to be reached without the decimal point. So, 0.200 and 2.00 equals both 200 increments.

Both negative and positive integer values can be entered to the "Trigger Increments" field.

By selecting "Rising" from the "Trigger Edge" drop down box, the recording will start when the increments value is reached from a value lower than the increments value.

By selecting "Falling" from the "Trigger Edge" drop down box, the recording will start when the increments value is reached from a value higher than the increments value.

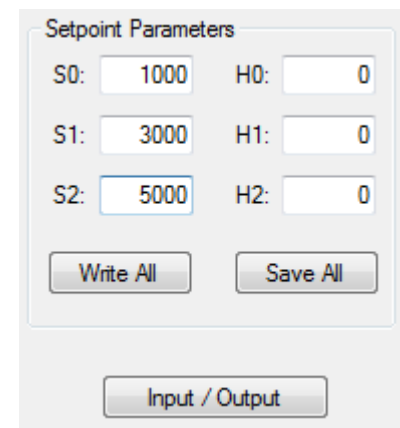
## 28.4 Setpoint Parameters

In the "Setpoint Parameters" group box, the most common parameters from the setpoint commands group are represented for easy access when trimming of setpoints parameters are necessary.

### 28.4.1 Changing Parameters

In the "Setpoint Parameters" group box, the parameters from the setpoint commands group can be inspected and values can be changed. Simply select a parameter text field and change the value.

If some of the other parameters from the setpoint group need to be inspected or changed, select the "Input / Output" button for access to the more detailed "Input / Output" dialog.



### 28.4.2 Write Settings

By selecting the "Write All" button, the changed setpoint parameter 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 device.

### 28.4.3 Save settings

If the changed setpoint parameter values are to be used after device power down / up, it's necessary to save the settings into the EEPROM of the device.

By selecting the "Save All" button, the changed setpoint values are saved into the EEPROM of the device.

## 28.5 Start Record

By selecting the "Start Record" button, the streamed real time values "Net / Gross Weight" and "Output" values will all at the same time be recorded from the H&B device assigned to the measurement channel and stored internally.

Start Record

When the recording is started, the button text will change to "Stop Record". By selecting the "Stop Record" button the record will stop. The record will also automatically stop when the selected recording time is reached.

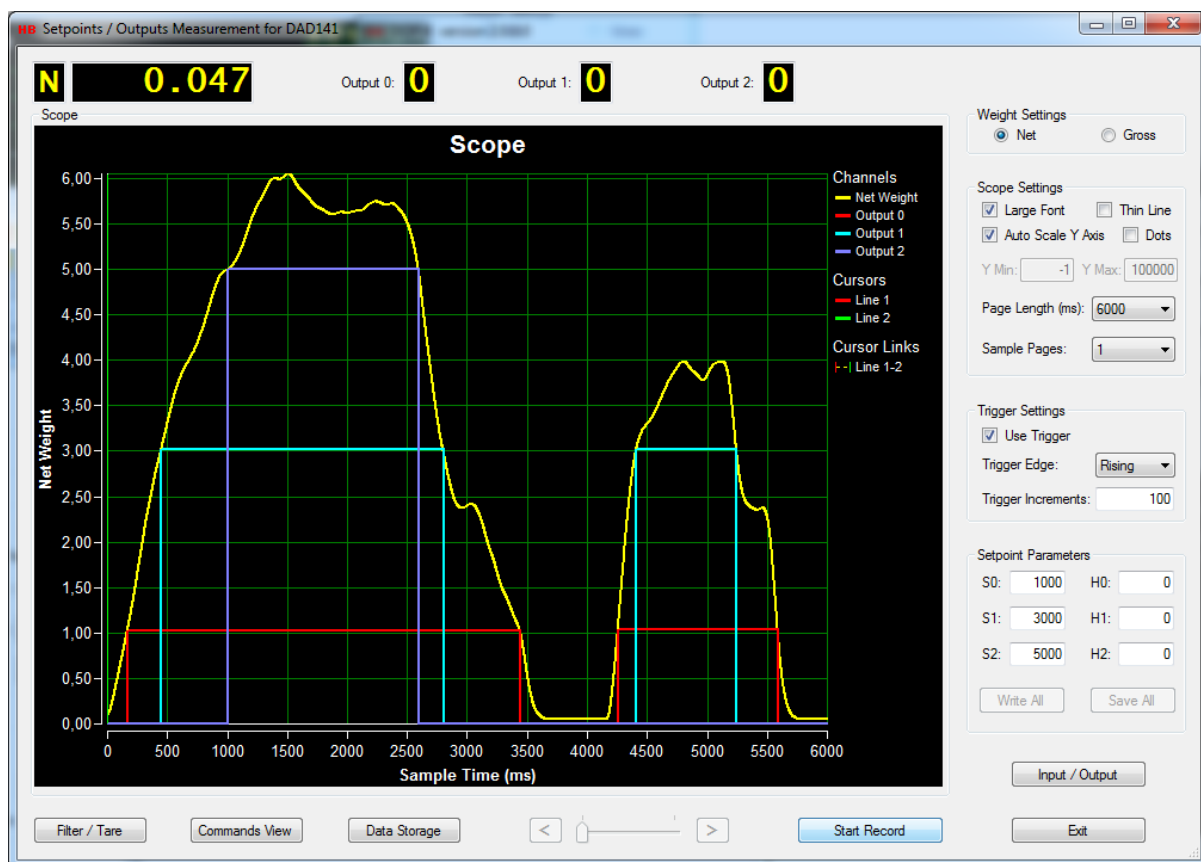
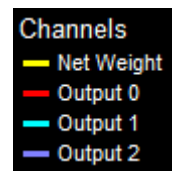
Stop Record

The length of the recording depends on the scope page length and the number of scope pages selected in the "Scope Settings" group box. Read the "Scope Settings" section for more details.

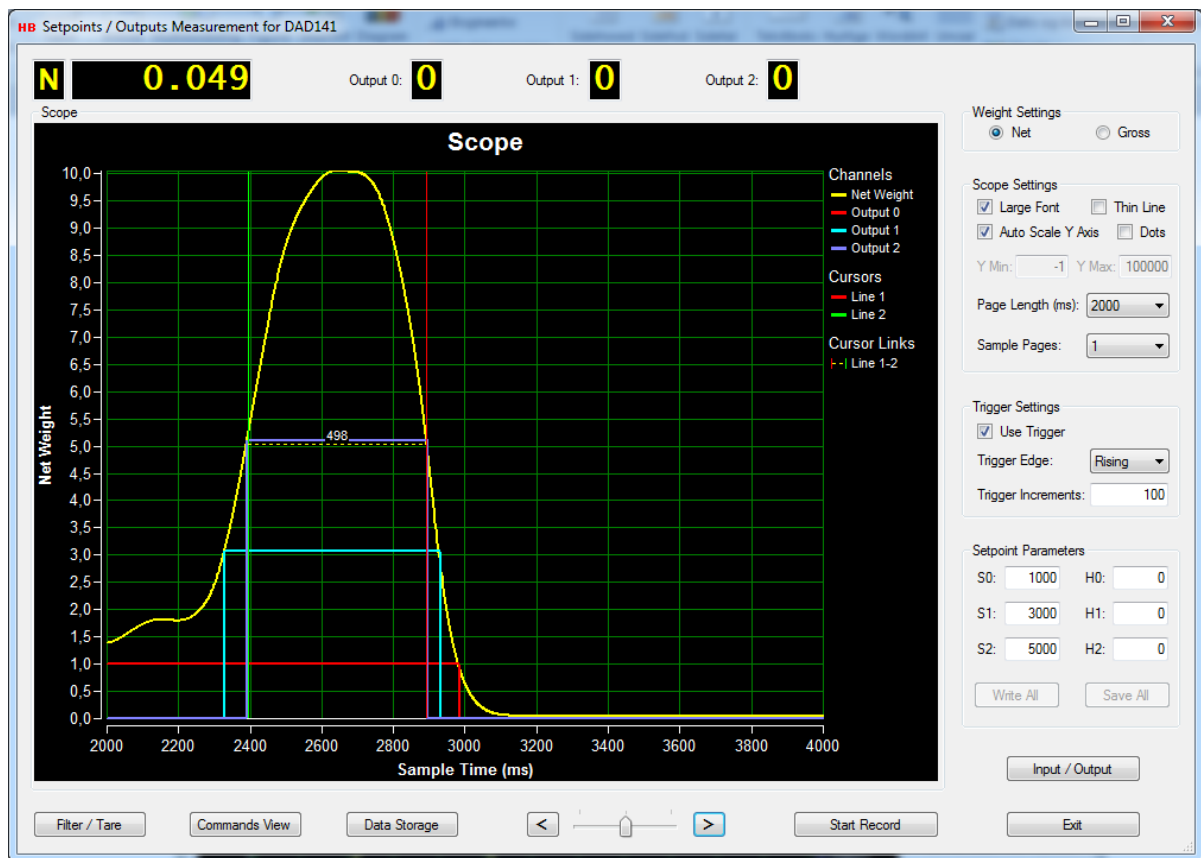
When a given hardware output goes high the graph belonging to that output will take the value specified by the belonging setpoint. The graph will take the value of 0 when the output signal goes low.

The weight graph and the output graphs are each represented by an individual color as shown to the right on the scope.

The figure below shows an example of a recording, where all 3 outputs of the connected device, goes from 0 and above the value for the setpoint 2 value and back to 0 again.



## 28.6 Analyzing the measurement

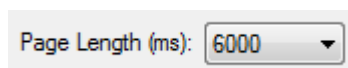


When the recording is stopped, the data recorded for all the data channels can be analyzed in detail.

The red and green cursor lines can be used to mark specific areas of the scope display.

Refer to the section "Scope display Functions" for a description on how to use the red and green cursor lines.

It's possible to analyze the "Setpoints / Outputs Measurement" session more detailed by decreasing the value of the page length after a measurement record.

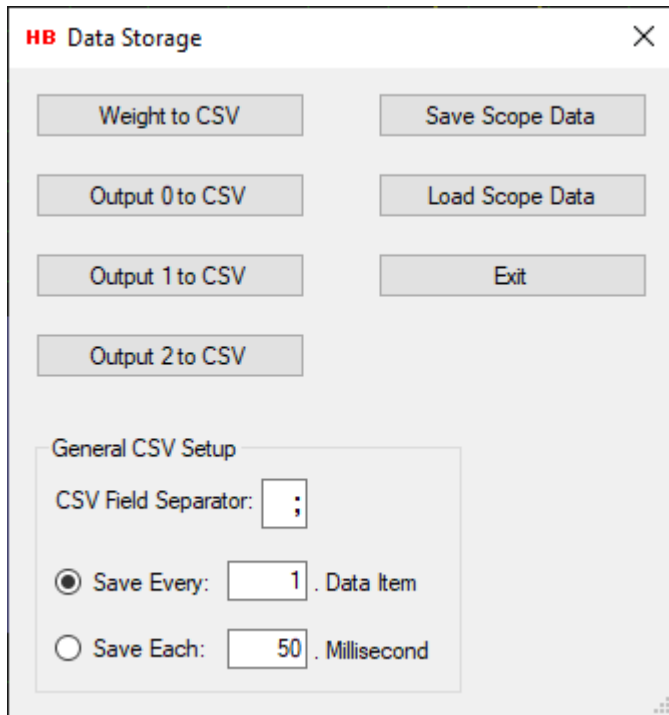
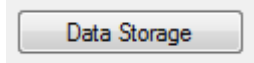


The measurement result will then be divided into several measurement pages, which then can be analyzed in detail by using the two arrows in the bottom of the "Setpoints / Outputs Measurement" dialog.



## 28.7 Data storage

From the “Data Storage” dialog the user can save recorded scope display data from the scope display to a disk file.



### 28.7.1 Save scope display data as binary

The recorded scope display data can be saved as a binary file by selecting the “Save Scope Data” button. The saved scope display data can then later be reloaded into the scope object in the “Setpoints / Output Measurement” dialog and into the main window of the DOP 4 application, for further investigation.

By selecting the “Save Scope Data” button, the binary scope data currently appearing on the scope will be saved as a binary file. A “Save File” dialog will appear, and a proper file name can be selected for the binary scope display data file.

The scope display data will be saved with the extension .rsd (Recorded Stream Data).

### 28.7.2 Load scope display data

Previously saved recorded scope display data can be reloaded by selecting the “Load Scope Data” button.

By selecting the “Load Scope Data” button a “Load File” menu will appear.

By selecting a file with the extension .rsd (Recorded Stream Data) the scope object will be loaded with recorded stream data for the measurements data channels.

The loaded scope display data can later again be saved as CSV data if wanted.

### 28.7.3 Save scope display data as CSV text files

Recorded scope display data can be saved channel by channel as a CSV (Comma Separated Values) text files, which can be loaded into for instance a Microsoft Excel application for further investigation.

By selecting the "Weight to CSV" or one of the "Output x to CSV" buttons, the scope display data for that specific channel, will be saved as a CSV file. A "Save File" dialog will appear, and a proper file name can be selected for the CSV file. Scope display data saved as CSV files are saved with the extension .csv.

Only the "Output x to CSV" buttons where the channel they represent having recorded data on the scope display will be enabled.

The CSV data is saved as two columns with the scale weight in the first column and the recorded time in milliseconds in the second column.

	A	B	C
1	459	0	
2	456	1,666016	
3	453	3,333008	
4	450	5	
5	447	6,666016	
6	444	8,333008	
7	441	10	
8	438	11,66602	
9	434	13,33301	
10	431	15	
11	428	16,66602	
12	424	18,33301	
13	421	20	

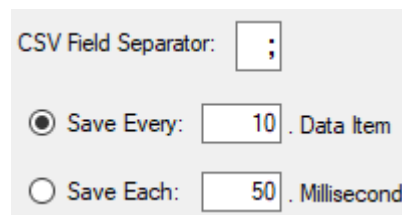
The figure shows recorded CSV data from H&B device, loaded into Microsoft Excel.

### 28.7.4 CSV Settings

In the text field "Field Separator" the CSV field separator can be specified. By default, the separator character will be the separator character for the current country language used by the PC.

A limitation of the CSV data amount to be saved can be set in the text field "Save Every x. Data Item". If the value of the text field for instance is set to 100, only 1 out of 100 data items will be saved. One data item is saved, and the next 99 data items are skipped and so on. Set the value to 1 if all items should be saved.

A time limit can also be defined so only data matching the defined data interval (equal or nearest higher) will be saved. If "Save Each" is set to 50 milliseconds, data with the time interval of 50 milliseconds (0, 50, 100, 150 ...) will be saved.



CSV Field Separator:

☒ Save Every:  . Data Item

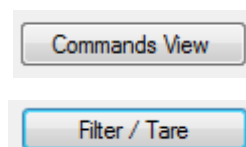
☐ Save Each:  . Millisecond

## 28.8 Other dialogs

Two other dialogs are available for adjusting device parameters and saving scope display data for unfiltered and filtered graphs.

The "Commands View" dialog and the "Filter / Tare" dialog are explained in other sections, so they will not be explained in this section.

The "Filter / Tare" dialog can also be accessed by clicking on the net weight display.



## 29 Counting Items

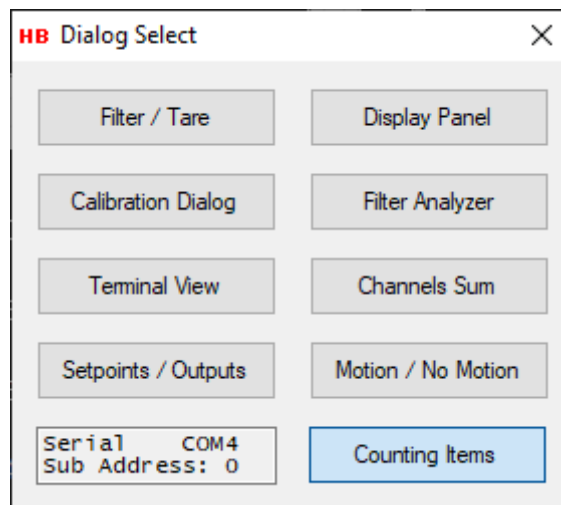
By selecting the "Counting Items" button in the popup menu "Dialog Select" as explained in the section covering "Dialog Shortcuts", the "Counting Items" dialog will be opened.

From the "Counting Items" dialog items can be counted based on a previously measured load on the scale with a given number of items weighing exactly that measured load based on the values received from the GS - Get Sample command.

Let's take 100 paper clips weighing 50 g totally. From that information it can be calculated that a weight of 10 g would mean that 20 paper clips is placed on the weighing load cell.

As the counting calculations are based on the sample values from the GS - Get Sample command, you can read weight values independently of the counting process.

The parameters of the device used for counting items is not changed when calibrating number of items against a given weight. All calculation is based on the value of the GS parameter and stored in the DOP 4 application alone.



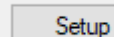
The figure above shows the "Counting Items" dialog when opened for the first time. No setup has been performed.



The figure above shows the "Counting Items" dialog after the setup calibration has been performed.

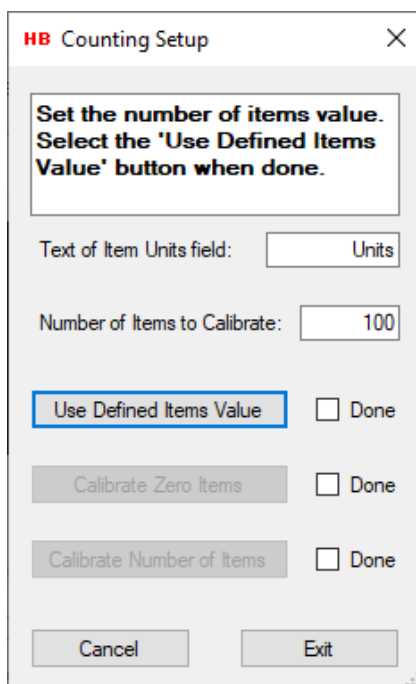
## 29.1 Calibrating counting items

By selecting the Setup button, the "Counting Setup" dialog will be opened.  
From the "Counting Setup" dialog, the units of the items and the relationship between items and weight can be defined.



By following the setup steps one by one the calibration of counting items can be done.

Start by defining the text to be placed in the unit's field.



HB Counting Setup

Set the number of items value. Select the 'Use Defined Items Value' button when done.

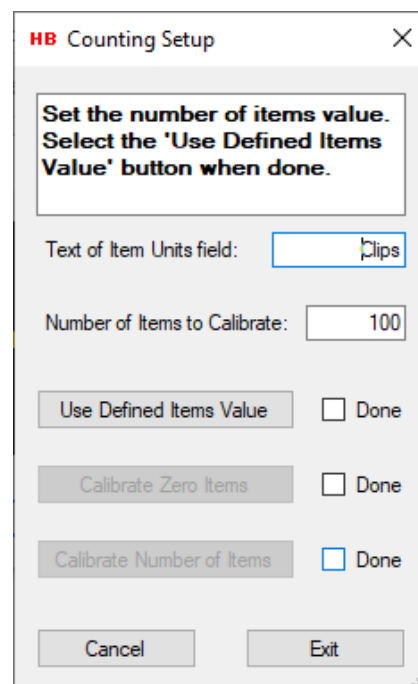
Text of Item Units field:

Number of Items to Calibrate:

☐ Done

☐ Done

☐ Done



HB Counting Setup

Set the number of items value. Select the 'Use Defined Items Value' button when done.

Text of Item Units field:

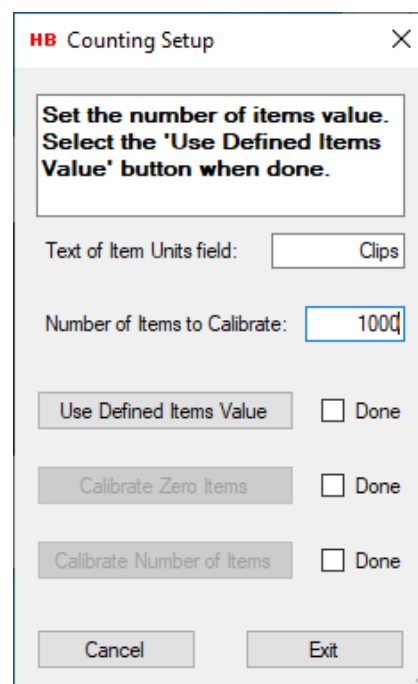
Number of Items to Calibrate:

☐ Done

☐ Done

☐ Done

Then define the numbers of items to calibrate. The total amount should be as high as possible to ensure most accuracy in the measurement. Select the "Use Defined Items Value" button.



HB Counting Setup

Set the number of items value. Select the 'Use Defined Items Value' button when done.

Text of Item Units field:

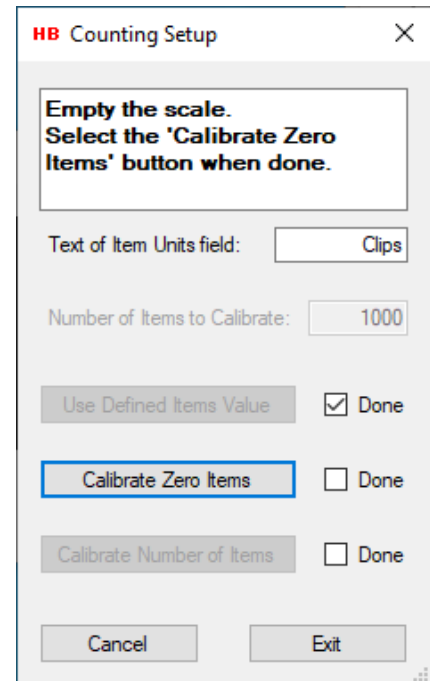
Number of Items to Calibrate:

☐ Done

☐ Done

☐ Done

Now we will empty the scale and define a zero-point which indicates and defines 0 items.  
When scale is empty. Select the "Calibrate Zero Items" button.



**HB Counting Setup** [X]

**Empty the scale.**  
**Select the 'Calibrate Zero Items' button when done.**

Text of Item Units field:

Number of Items to Calibrate:

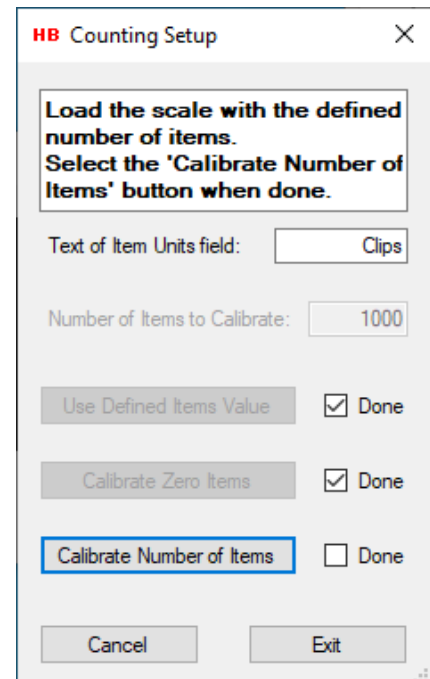
Use Defined Items Value ☒ Done

**Calibrate Zero Items** ☐ Done

Calibrate Number of Items ☐ Done

Cancel Exit

Put the same number of items on the scale as defined in the "Number of Items to Calibrate" text field and select the "Calibrate Number of Items" button.



**HB Counting Setup** [X]

**Load the scale with the defined number of items.**  
**Select the 'Calibrate Number of Items' button when done.**

Text of Item Units field:

Number of Items to Calibrate:

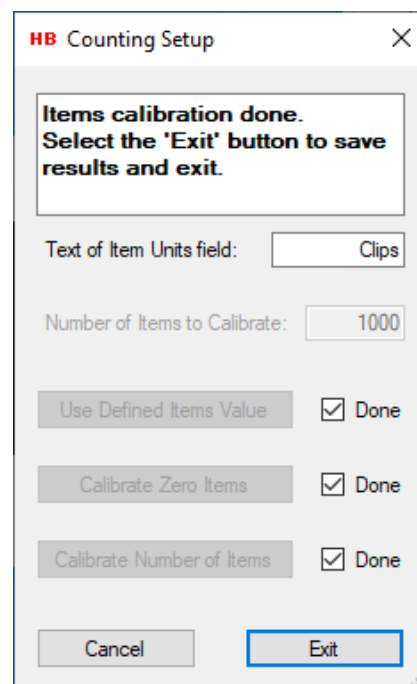
Use Defined Items Value ☒ Done

Calibrate Zero Items ☒ Done

**Calibrate Number of Items** ☐ Done

Cancel Exit

Select the "Exit" button to finish the counting setup procedure.



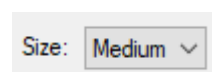
When leaving the "Setup" dialog, the display in the main "Counting Items" dialog shows the number of items on the scale together with units of the items.

If the number gets a bit jumpy, then try to adjust the "FL - Filter Level" parameter. 1 Hertz should be fine.

The result of the setup will be stored internally in the DOP 4 application and kept for the next application startup.

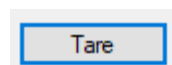
## 29.2 Size

The default size of the display can be changed by selecting one of the predefined size values from the "Size:" drop down box.



### 29.3 Tare the counting items scale

By selecting the Tare button, the number of items on the scale will be set to 0.



The figure above shows the display after a taring of the items scale has been performed.

### 29.4 Counting items and showing weight together

As showed in the figure you can have both a "Display Panel" and a "Counting Items" dialog open at the same time. This way you can monitor items and at the same read the total weight of the items on the scale.

