BSC4 Operating Manual

Introduction

- The BSC4 Amplifier takes up to 4 Independent Inputs and turns those signals into an analog or digital output.
- ±10V and 4-20mA (BSC4A) or USB outputs (BSC4D)
- 4 independent channels
- For use with model 3AXX series 3-axis load cells or multiple load cells
- Can be used with up to any 4 standard load cells (with mV/V output)
- Inputs for Strain gage / 0–10 V / PT1000
- Measurement ranges 2 mV/V / 10 mV/V
- 8 digital inputs / outputs
- Data rate 0 Hz–900 Hz

Description

This 4-channel measuring amplifier for sensors with strain gauges is equipped with a USB interface. The voltage is supplied via the USB port at the back of the measuring amplifier. The measuring amplifier can be delivered with an SUB-D37 connection or with 4x M12 ports. The measuring amplifier has eight digital inputs and outputs.

On the backside SubD25 socket, strain gauge full-bridges and half-bridges 120 Ohm up to 1 kOhm as well as PT1000 temperature sensors and 1000 Ohm single grid strain gages or voltages 0-5V can be connected.

Abbreviations	
DAQ	Data Acquisition
EXC	Excitation
SIG	Signal
PWR	Power
SE	Sense Leads

Options

BSC4A

±10V and 4-20mA output, up to 10 mV/V input, 37-pin input connector.

Includes power supply

BSC4D

USB output, up to 10 mV/V input, 37-pin input connector, USB powered.

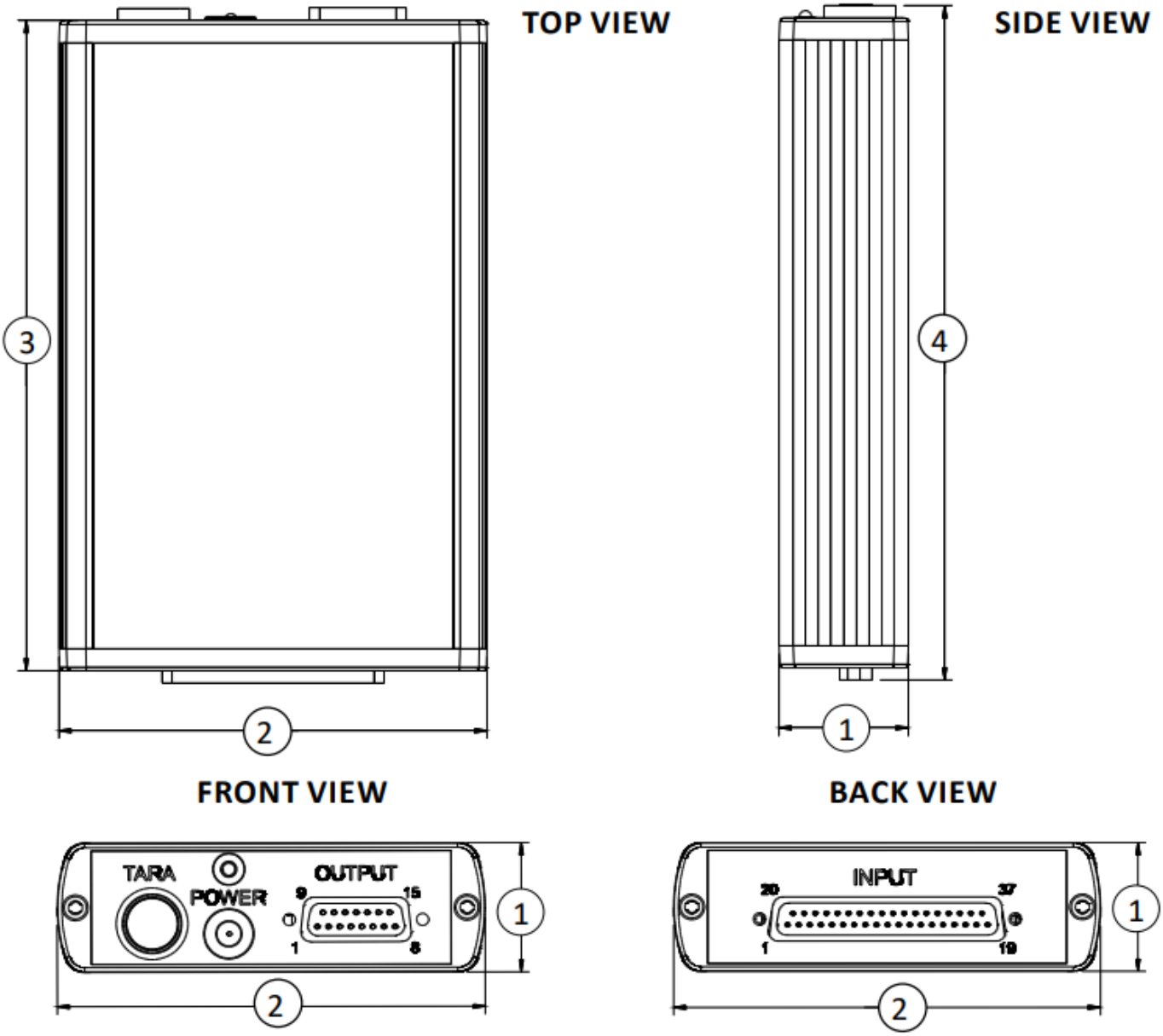
Includes graphing and logging software

Table of Contents

Technical Data

PERFORMANCE		BSC4A	BSC4D
Signal Input Range – mV/V		up to 10	up to 10
Accuracy Class – %		0.05	0.05
CMR – dB @ 60 Hz		95 - 110	95 - 110
Data Rate – Hz		N/A	0 - 900
Sampling Frequency – MHz		N/A	1.92
Cut-off Frequency – Analog – Hz		250	1000
Cut-off Frequency – Digital		N/A	Notch Filler
Resolution – bit		Analog	16
EXCITATION			
Excitation Voltage - V		5	2.5
Excitation Current – mA		10	10
Supply Voltage – VDC		11 to 30	4.5 - 5.5 from USB
Supply Current – mA		< 1000	< 200
ENVIRONMENTAL			
Operating Range	°C	-10 to +65	-10 to +65
	°F	+14 to +149	+14 to +149
Storage Range	°C	-40 to +85	-40 to +85
	°F	-40 to +185	-40 to +185
Zero Drift/ °C		0.005%	0.005%
Sensitivity Drift/ °C		0.001%	0.001%

Dimensions



DIMENSIONS

1		2		3		4	
mm	in	mm	in	mm	in	mm	in
32.0	1.25	106.0	4.17	161.0	6.33	169.0	6.65

BSC4A Diagram

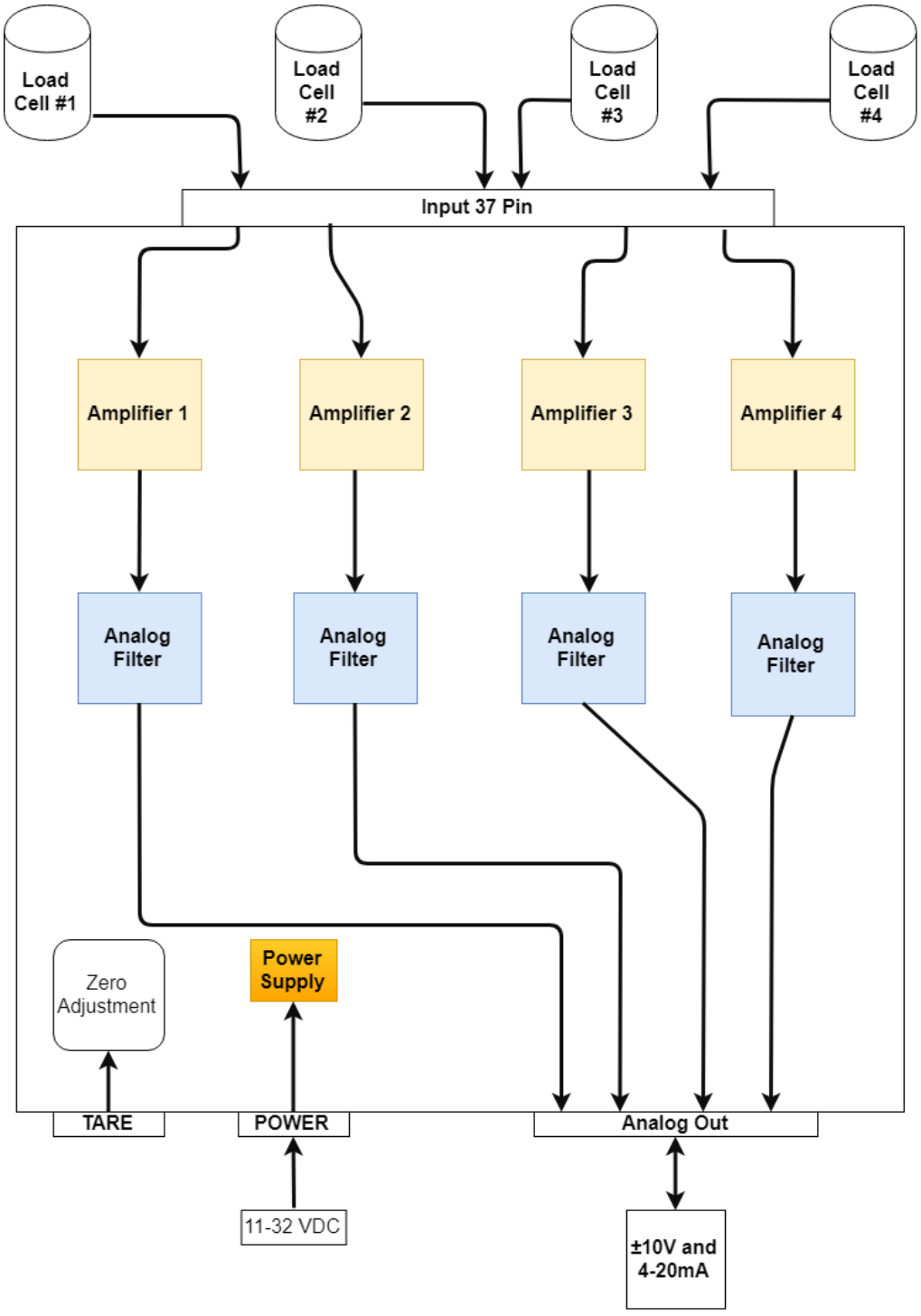


FIGURE 1 - BSC4A DIAGRAM

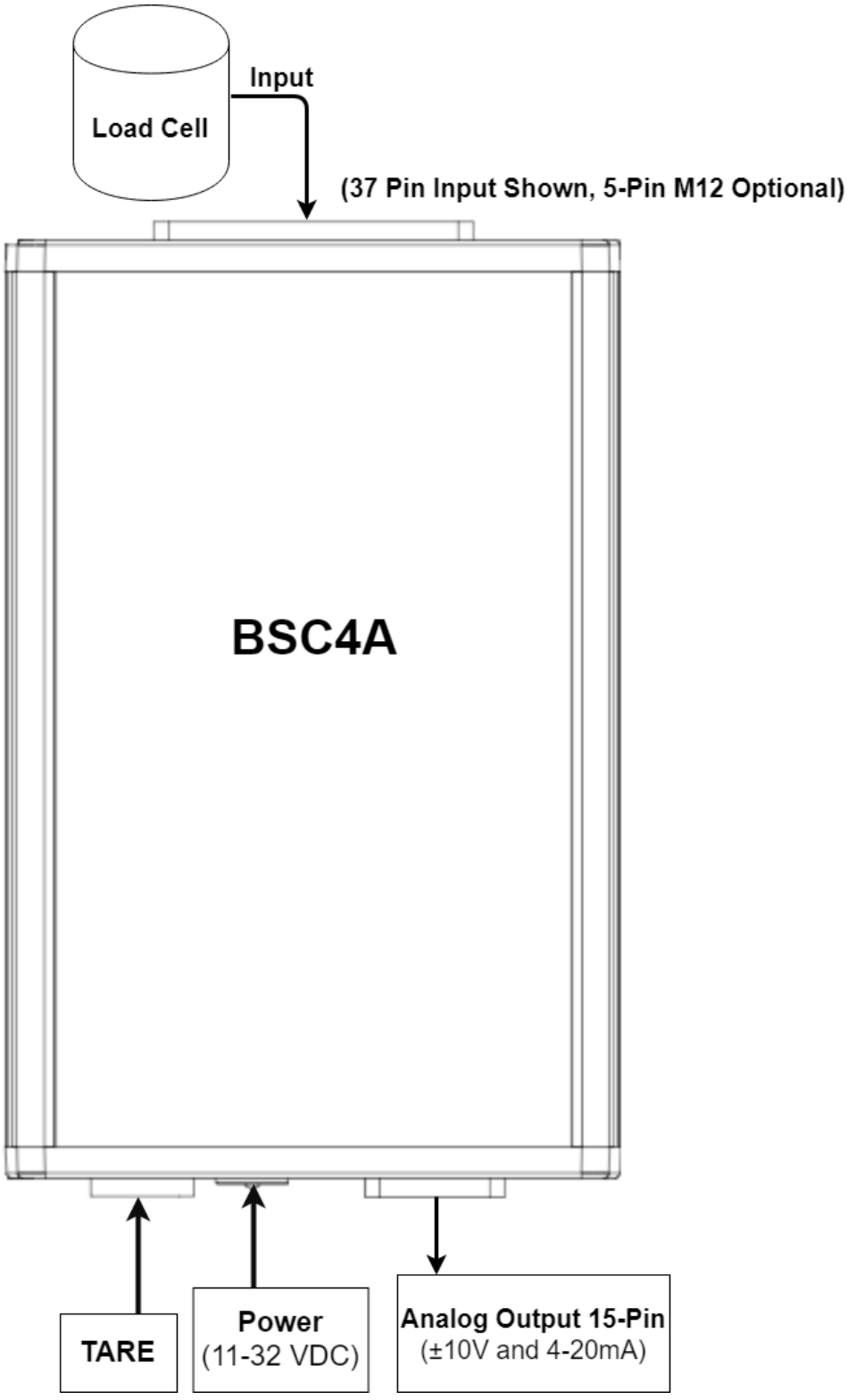


FIGURE 2 - BSC4A

BSC4D Diagram

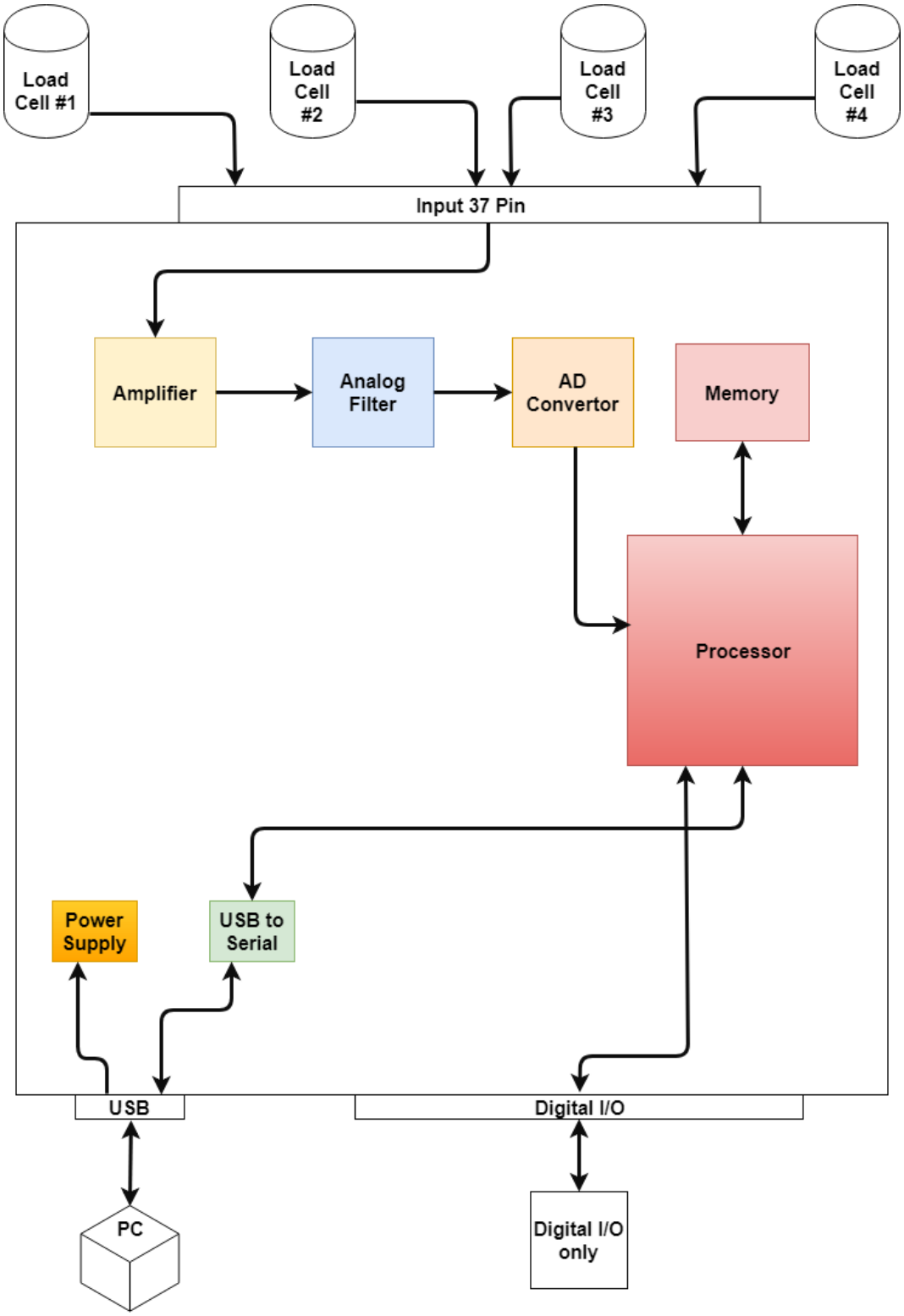


FIGURE 3 - BSC4D DIAGRAM

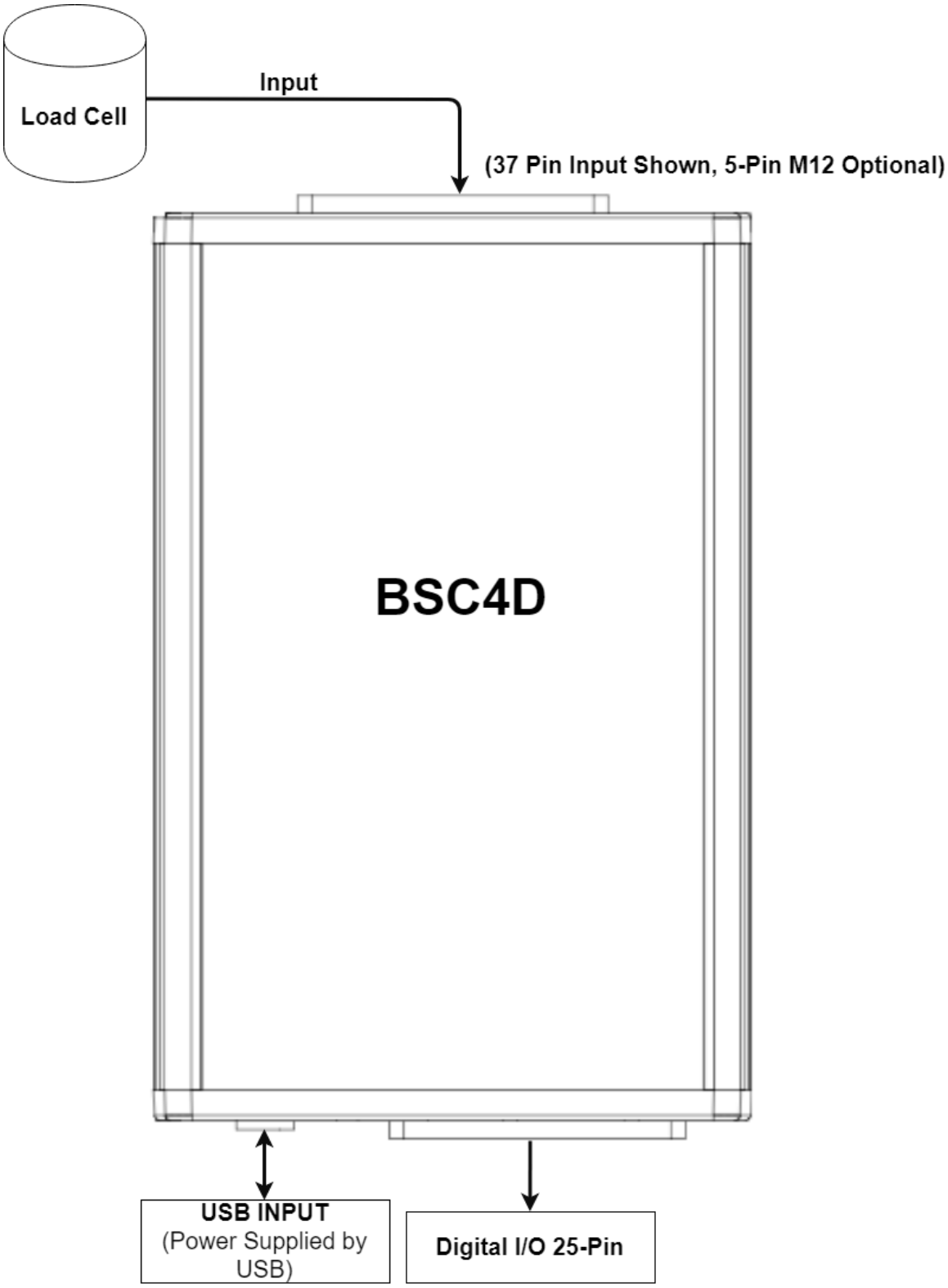
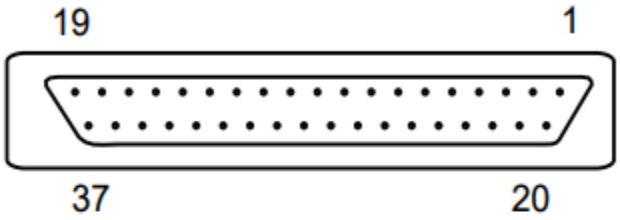


FIGURE 4 - BSC4D

Pin Assignment

Wiring diagram for 37-pin Sub-D socket

37-pin Sub D, female



Terminal assignment 37 pin Sub D, female

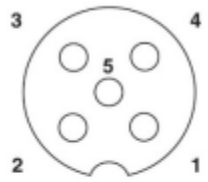
	BSC4A assignment	37-pin SUB-D (PIN No.)			
GND	Ground/shield	1			
		Channel 1	Channel 2	Channel 3	Channel 4
+Us	positive sensor power supply	20	2	11	29
+UF	positive sensor input	21	3	12	30
+UD	positive differential input	22	4	13	31
QB350	quarter bridge completion 350Ω 1)	23	5	14	32
HB	half bridge completion 2)	24	6	15	33
-UD	negative differential input 2)	25	7	16	34
-UF	negative sensor input	26	8	17	35
-Us	negative sensor power supply	27	9	18	36
Tare	automatic zero-point adjustment	28	10	19	37

1) Half bridge completion must be activated at the same time.

2) The negative differential input (25, 7,16, 34) must be connected to the corresponding half bridge completion (24, 6,15, 33).

FIGURE 5 - 37 PIN ASSIGNMENT

Wiring diagram for 5-pin socket M12x1, type 763

	5-pin	Description	Color code for cable	
	2	-U_S negative bridge power supply	white	white
	1	+U_S positive bridge power supply	brown	brown
	3	+U_D positive differential input	green	blue
	4	-U_D negative differential input	yellow	black
View of socket side	5	AUX connected to quarter bridge 350 ohm (QB)	grey	grey

Six-wire technology is not possible for M12 socket variant.

In quarter bridge and half bridge mode, the internal half bridge completion must be activated via the solder bridge on the circuit board (also possible in the factory as a free order option).

FIGURE 6 - 5 PIN M12 ASSIGNMENT

Wiring diagram for output socket 15-pin Sub-D socket

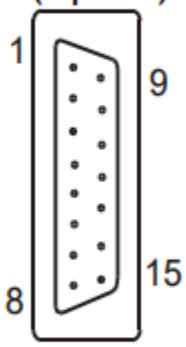
Socket Spring contacts (Top view)	BSC4A assignment	15-pin SUB-D (PIN No.)			
	GND for shielding	1			
	Zero-point adjustment (joint)	8			
	Supply voltage	9			
		Channel 1	Channel 2	Channel 3	Channel 4
	Output voltage	2	5	15	12
	Output current	3	6	14	11
	Ground	4	7	13	10

FIGURE 7 - 15 PIN ASSIGNMENT

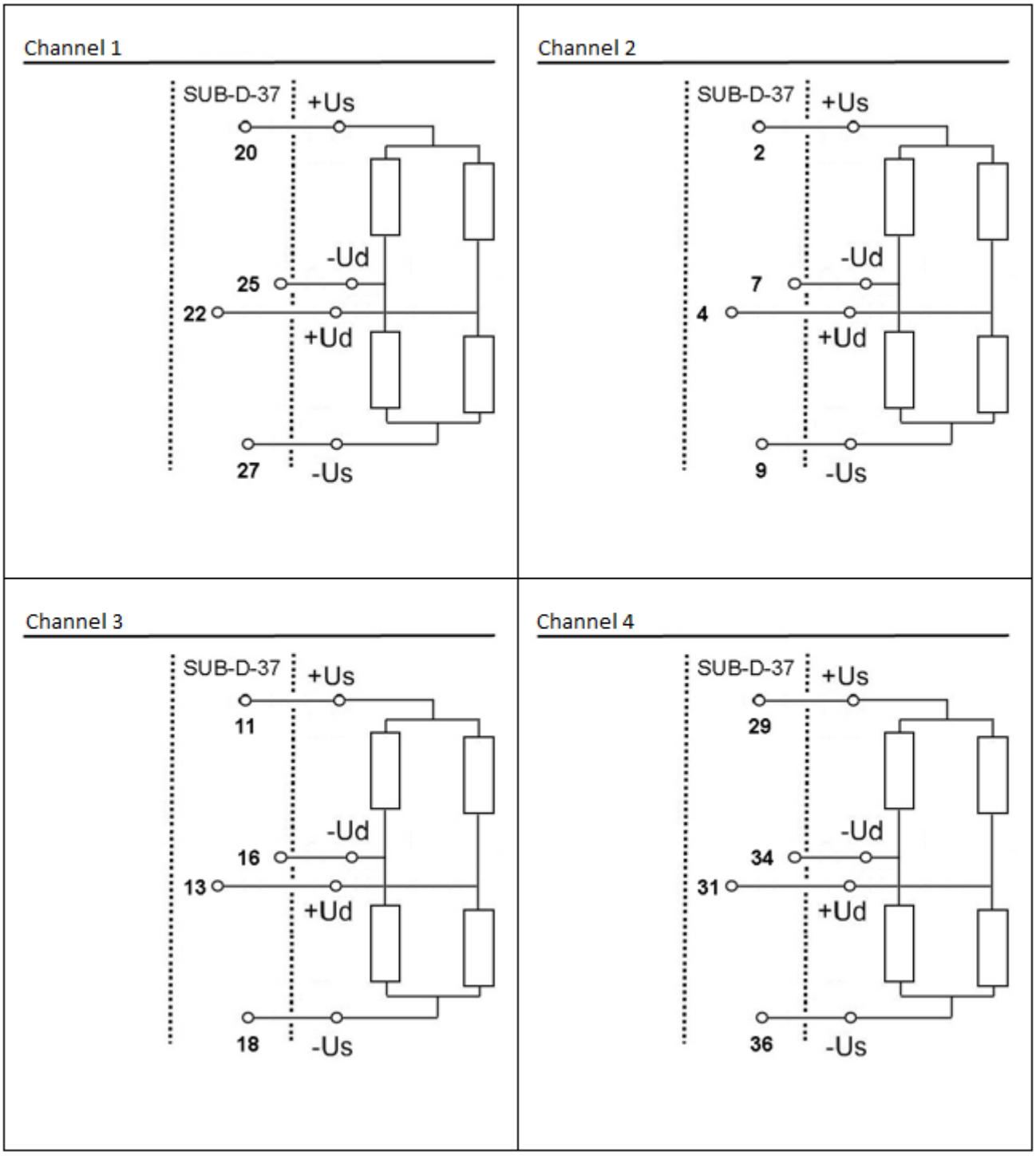
Connection assignment SUB-D25 port

BSC4D assignment	25-pin D-sub port (PIN-No.)			
IO 5 V fixed voltage output	1			
IO GND	2			
IO 1	3			
IO 2	4			
IO 3	5			
IO 4	6			
IO 5	7			
IO 6	8			
IO 7	9			
IO 8	10			
TX	11			
RX	12			
GND	13			
	Channel 1	Channel 2	Channel 3	Channel 4
Channel GND	14	17	20	23
	15	18	21	24
Channel AUX	16	19	22	25

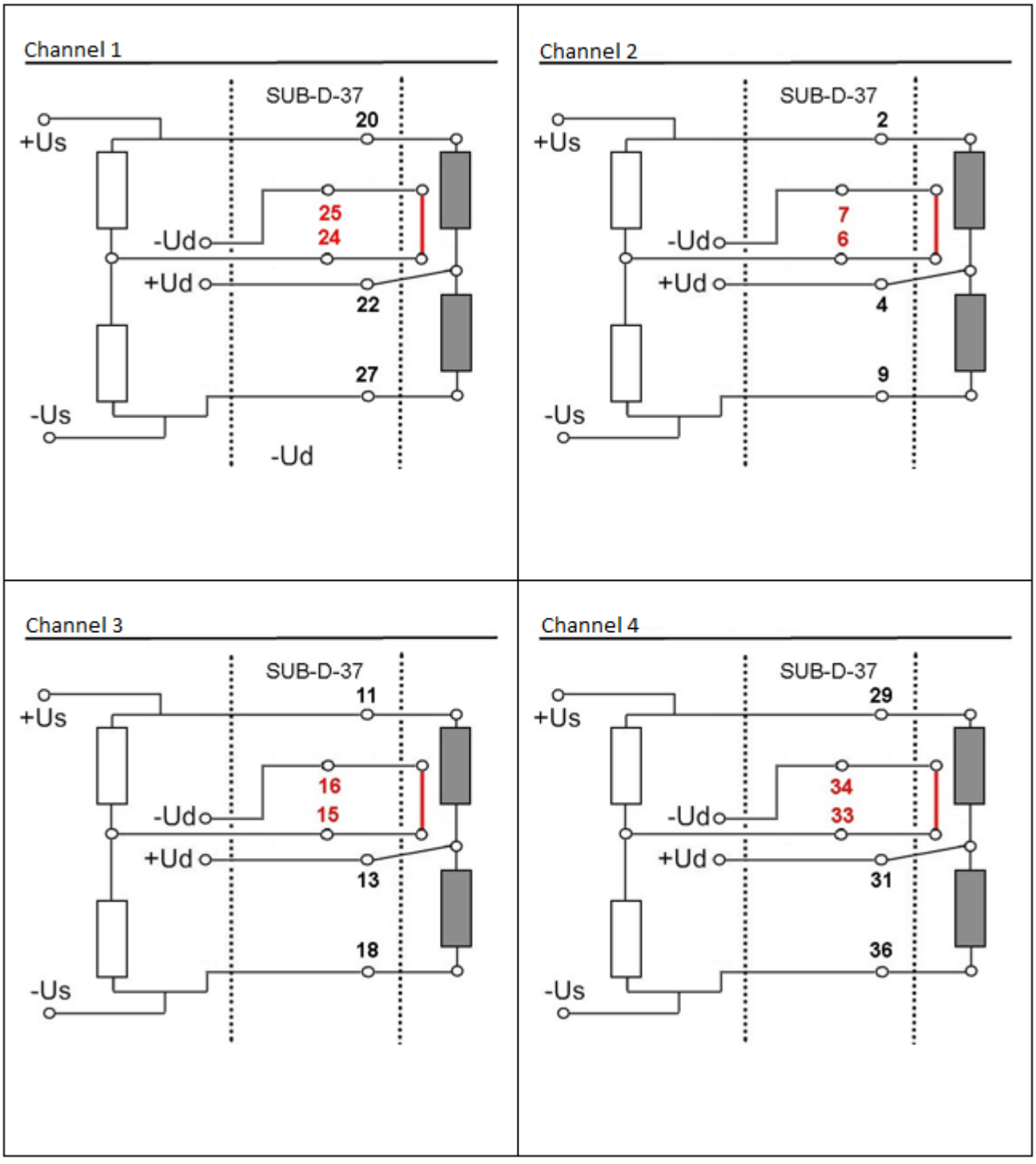
FIGURE 8 - 25 PIN ASSIGNMENT

Bridge Connections

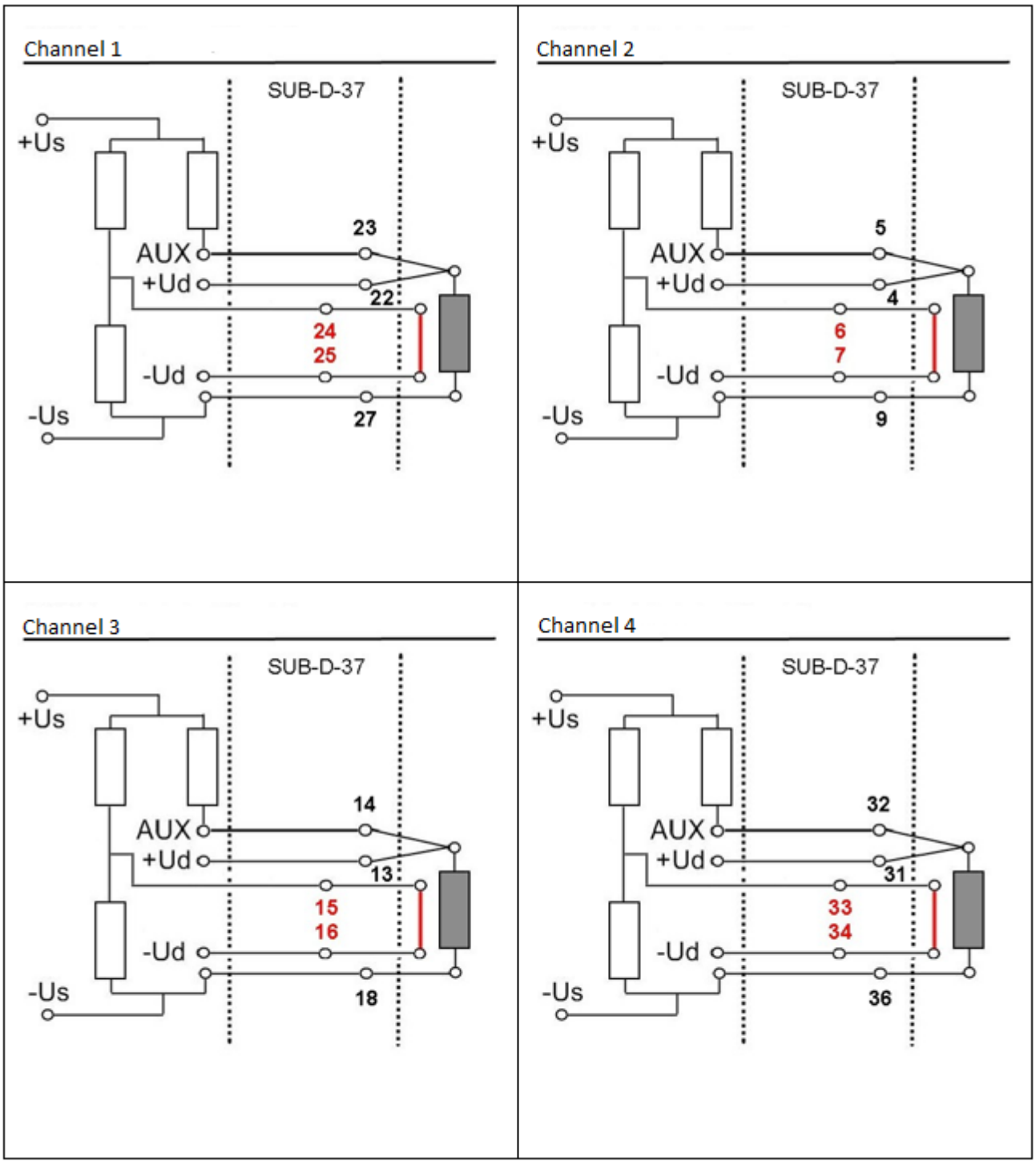
Full Bridge - 37 Pin



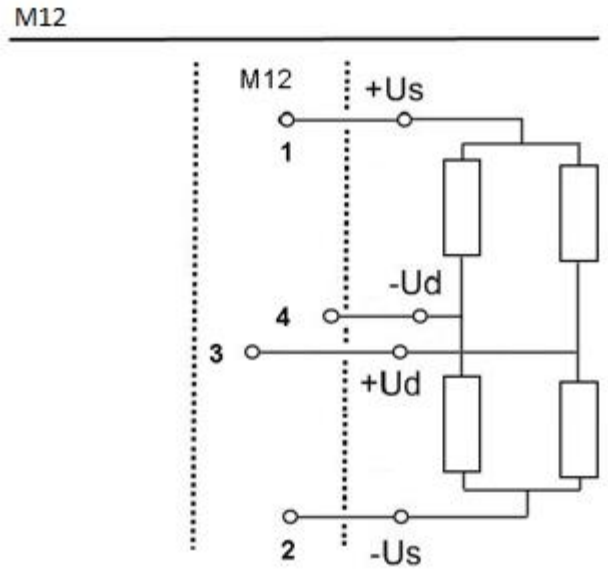
Half Bridge - 37 Pin



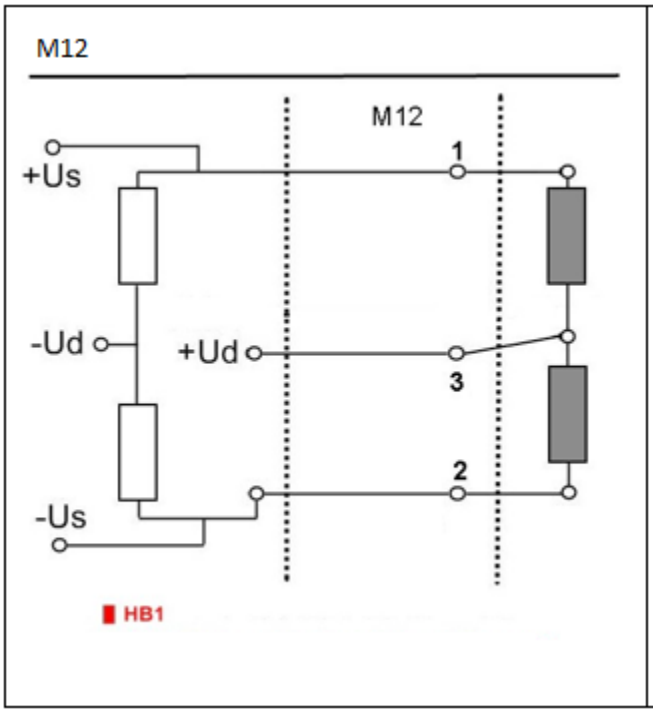
Quarter Bridge - 37 Pin



Full Bridge - M12



Half Bridge - M12



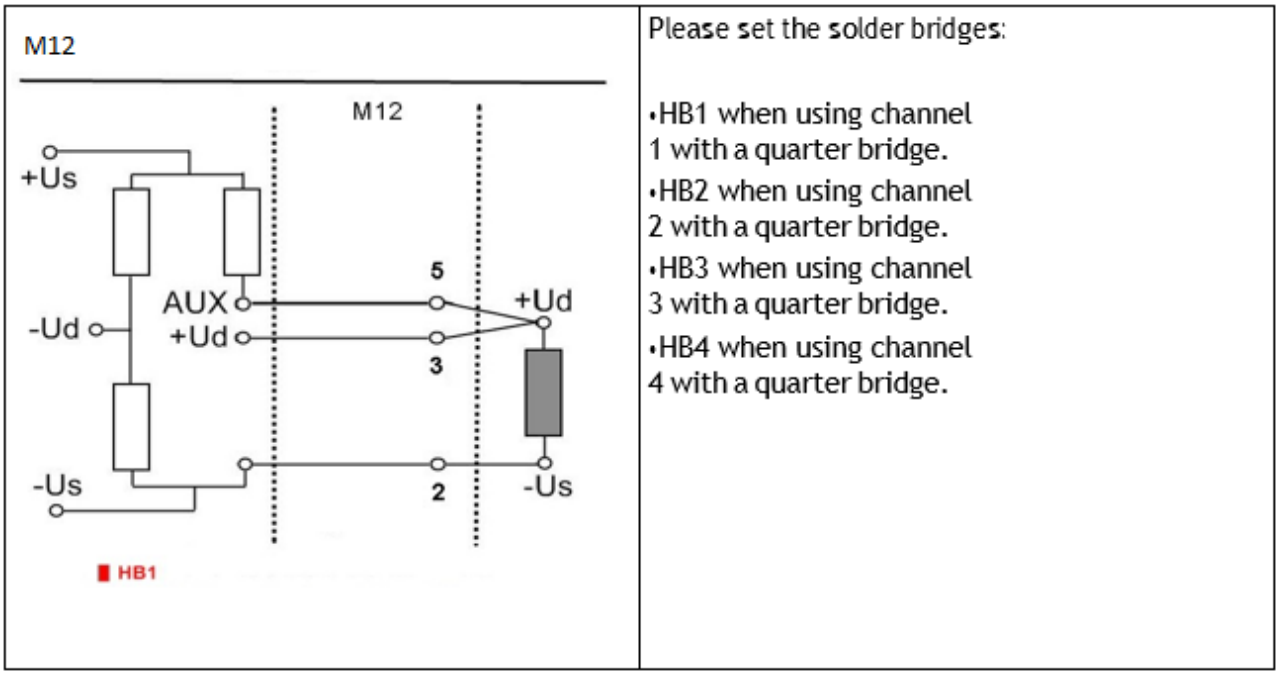
Please set the solder bridges:

- HB1 when using channel 1 with a half bridge.
- HB2 when using channel 2 with a half bridge.
- HB3 when using channel 3 with a half bridge.
- HB4 when using channel 4 with a half bridge.

Solder bridges: Figure 3: Solder bridges for configuring bridge extensions

see page 11

Quarter Bridge - PT1000 with M12



Please set the solder bridges:

- HB1 when using channel 1 with a quarter bridge.
- HB2 when using channel 2 with a quarter bridge.
- HB3 when using channel 3 with a quarter bridge.
- HB4 when using channel 4 with a quarter bridge.

Automatic Zero Point Setting

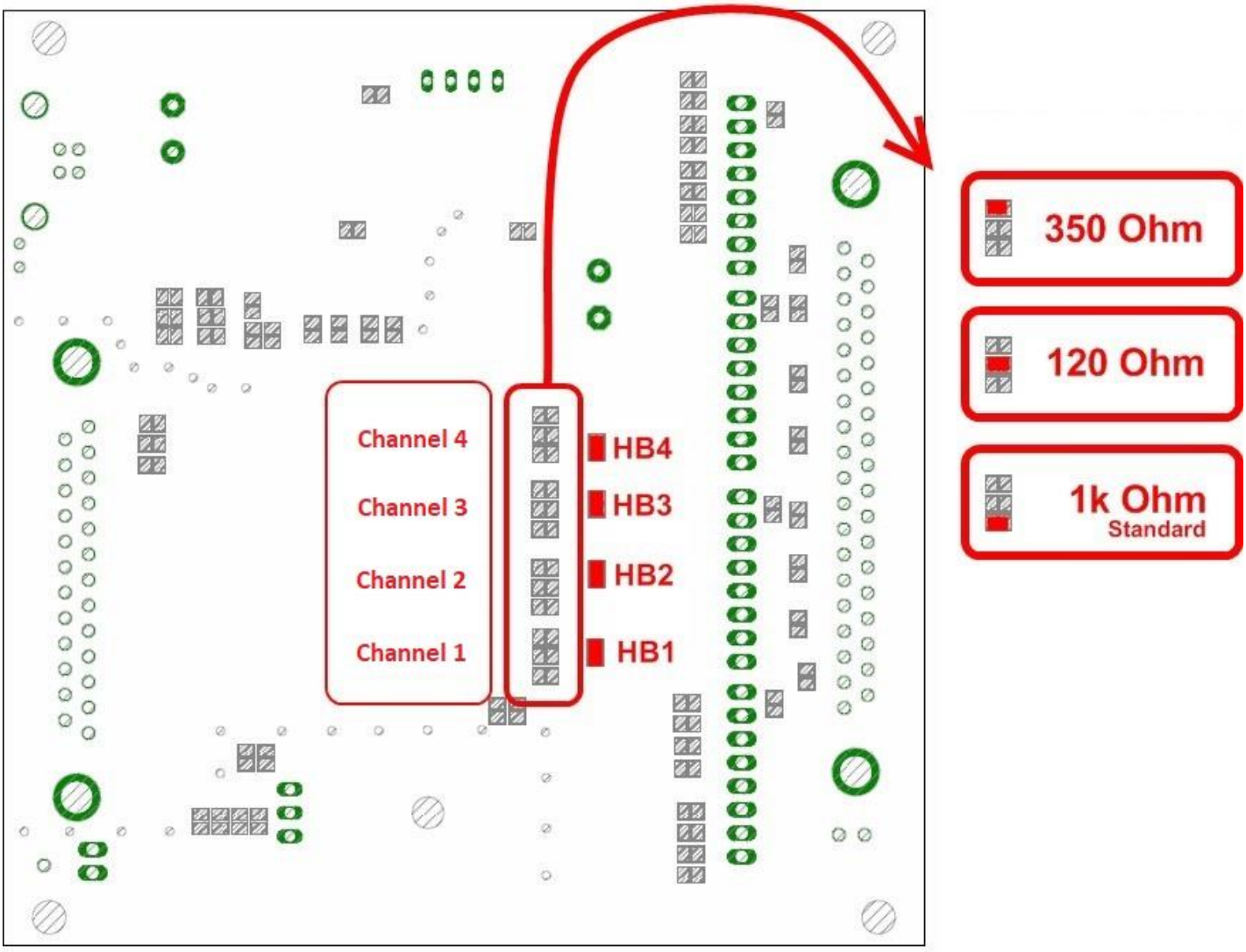
The automatic zero point setting is done via push button or via the digital input PIN 28 or 10 or 19 or 37.

Note: The GNDio PINs for the automatic zero adjustment are separated from the analog ground.

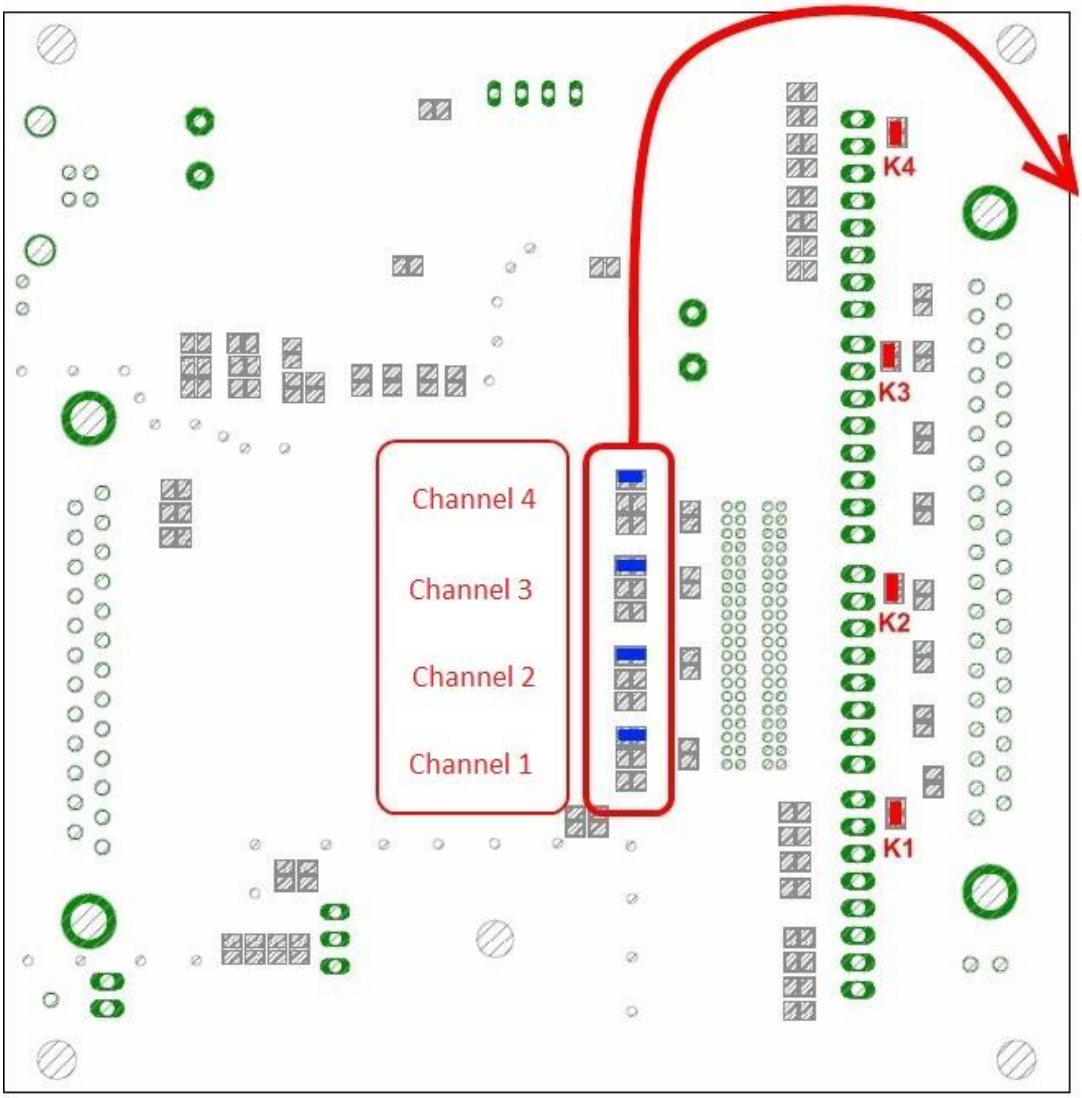
Connect GNDio (PIN1) permanently to analog ground of power supply and connect the supply voltage, but at least 3.5V with PIN 28 or 10 or 19 or 37 for remote zeroing.

Adapting the Bridge Extension

The bridge extension can be adapted individually for each channel; open the device and extend the desired solder bridge according to the following figure.



Altering Strain Gage Input to the Voltage Input



1. Remove the Jumper for the Selected Channel

2. Install Jumper on the Correct K Input.

K1 - Channel 1
K2 - Channel 2
K3 - Channel 3
K4 - Channel 4

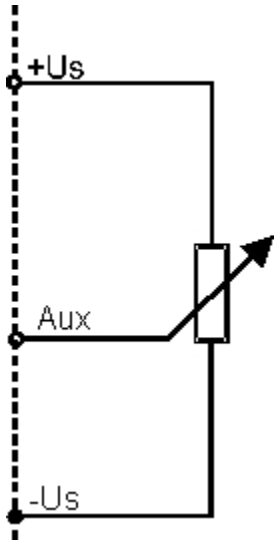
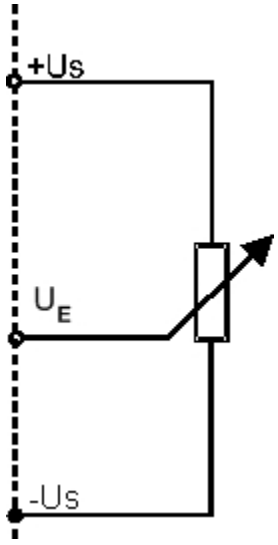
Opening the device

1. Remove both screw covers from the input side and remove the fastening screws from the front cover.
2. The two hexagonal bolts on the 37-pin D-Sub port must be loosened using a socket spanner (5 mm).
3. The printed circuit board is pulled out on the side of the 25-pin D-Sub port.

Wiring Diagram for Position Sensors

The measuring amplifier must be configured by the manufacturer separately when using it with potentiometric position sensors (linear potentiometers or draw wire displacement sensors) for the M12 version.

The position sensor's wiper is connected to the measuring amplifier's "Aux" input (M12) or "U_E" (SubD37). The position sensor supplies via the sensor supply +Us and -Us.

5-pin port	37-pin D-SUB port
	

The potentiometric position sensor is supplied with 2.5 V. The "Aux" input or U_E records voltages of 0...5 V.

BlueDAQ Software Installation (Compatible with BSC4D)

1. **Please follow these instructions carefully. DO NOT** connect the amplifier to the PC until instructed to do so. The BlueDAQ PC software is included on a USB Flash Drive with the amplifier or can be downloaded from www.interfaceforce.com

2. Install the software by double-clicking the “setup.exe” file located in the BlueDAQ folder. You may need to “Extract” the contents of the folder first if you downloaded it from the website. Follow the instructions for installation. Once the software completes installation you **MUST** restart your computer.

3. Attach the amplifier to the PC using the supplied USB A-B cable. BSC4, BSC8 and BX8 drivers were installed with the BlueDAQ software and Windows will automatically load them. BSC8D/BX8 must be powered ON using supplied power cable and power switch. 9330 drivers must be installed as described below.

4. When the device is connected in **Communication mode** for the first time, Windows will ask for a driver directory. The installation process is described below. The driver is located on the USB Flash drive supplied with the 9330. The Flash drive **MUST** be connected to the PC or the files copied to the PC before connecting the 9330 to the PC.

5. Enable USB Communication mode. To do this, click the MODE button of the measuring amplifier and select USBmode: Comm in the logger menu.

6. Now you can connect your 9330 to the PC via USB cable. Once connected the driver installation window appears. Select “Install software from a list or specific source (advanced users)” and Click “Next >”.

FIGURE 9 - FOUND NEW HARDWARE WIZARD

7. Click “Search for the best driver in these locations”

8. Check the option “Include this location in the search:” and then click “Browse”. Select the folder: 9330_Com_Driver from the supplied USB drive and Click “Continue >”.

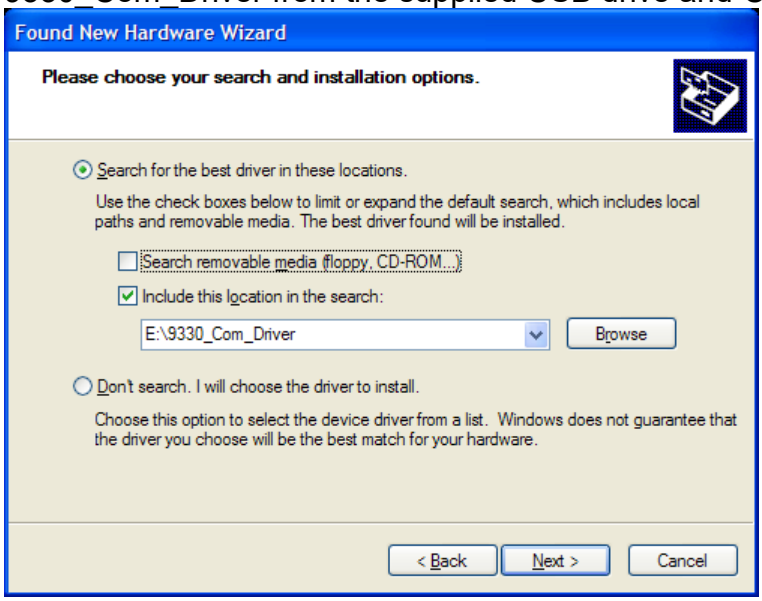


FIGURE 10 - NEW HARDWARE WIZARD

9. In the dialogue window “Hardware installation” click “Continue installation”.

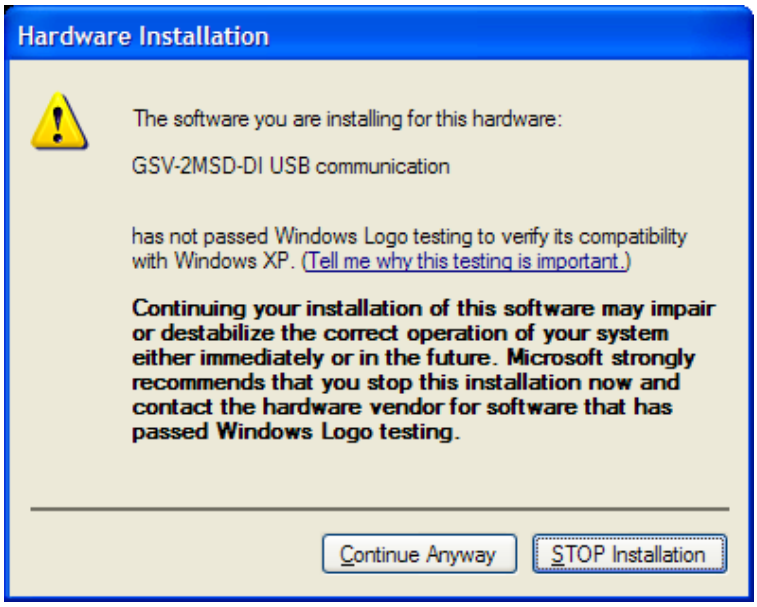


FIGURE 11 - HARDWARE INSTALLATION

10. The driver was installed successfully. Click “Finish”.

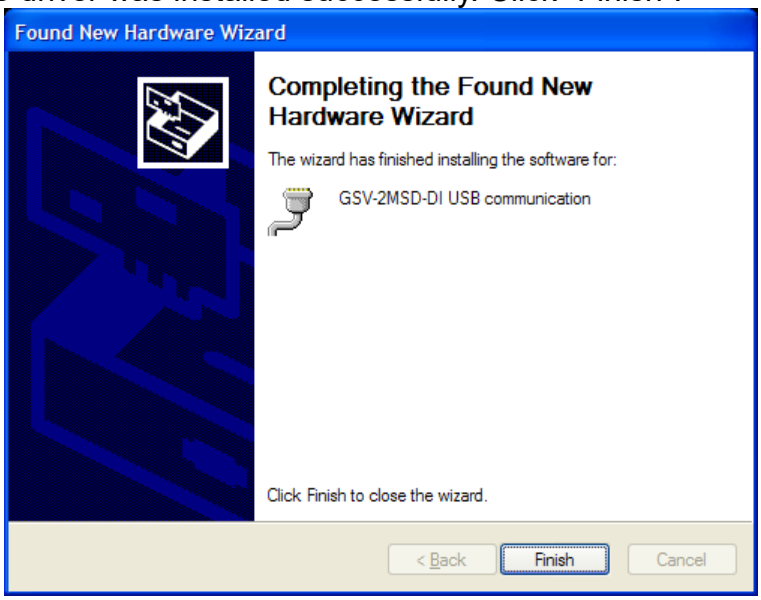


FIGURE 12 - HARDWARE INSTALL FINISH

COM Ports

1. Once windows is finished installing the device navigate to Device Manager and check for a new **USB Serial Port** (COMX) where X is the assigned port number. Remember this number. In the examples below it is COM6 or COM28

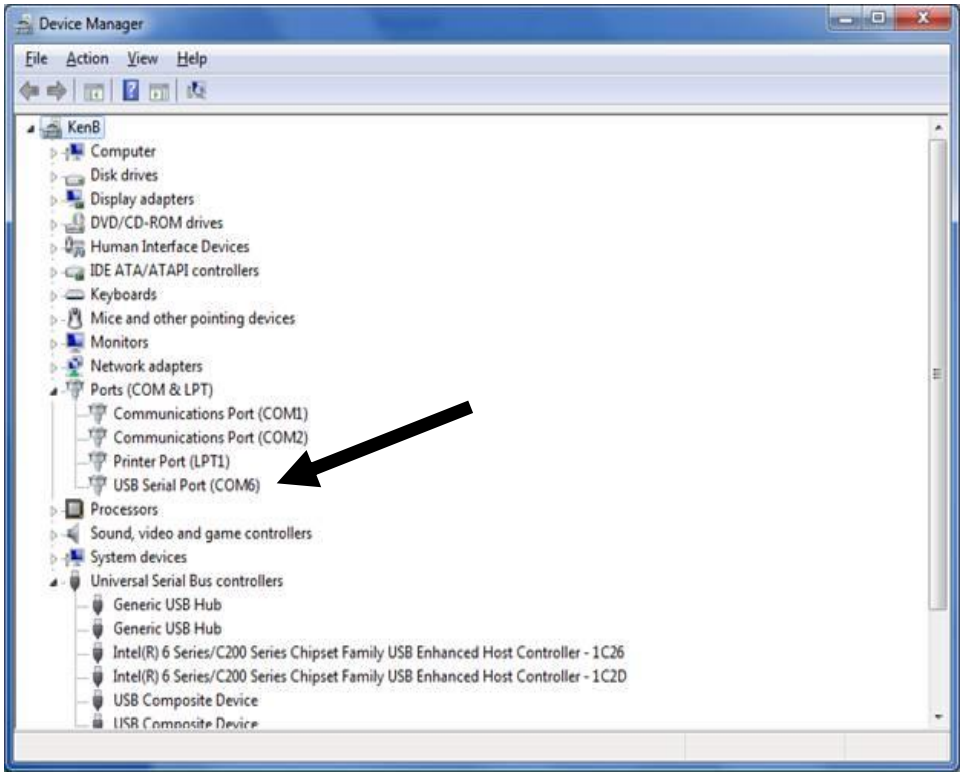


FIGURE 13 - EXAMPLE OF BSC4

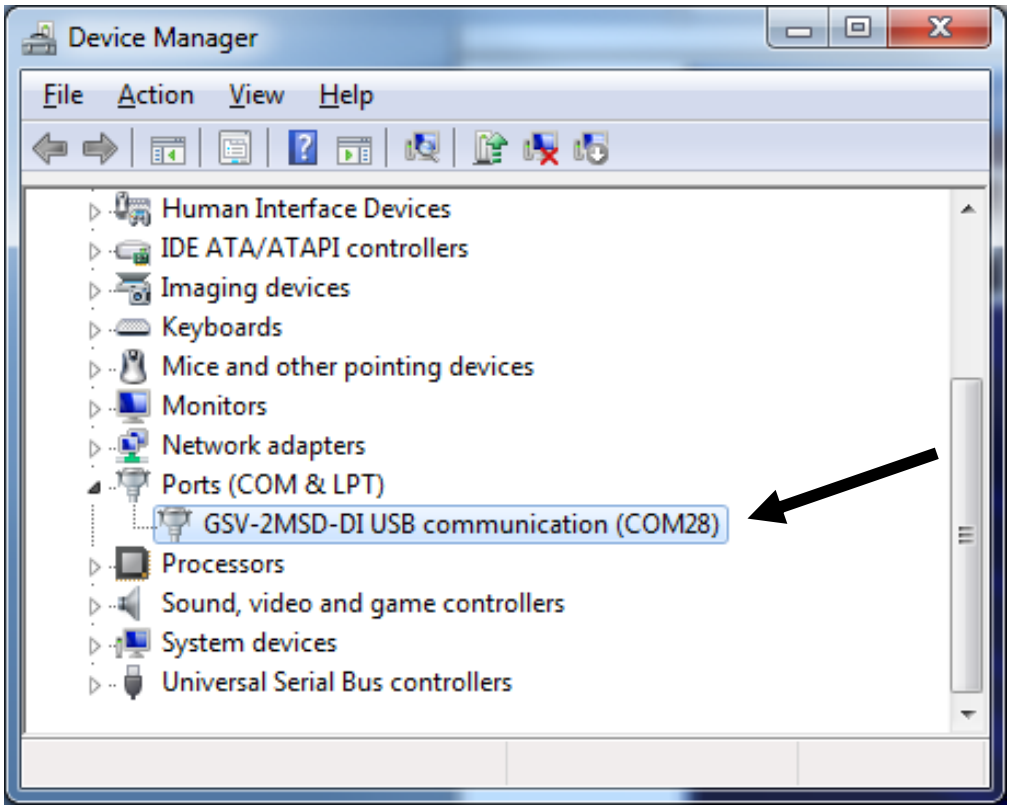


FIGURE 14 - EXAMPLE OF 9330 COMPORT

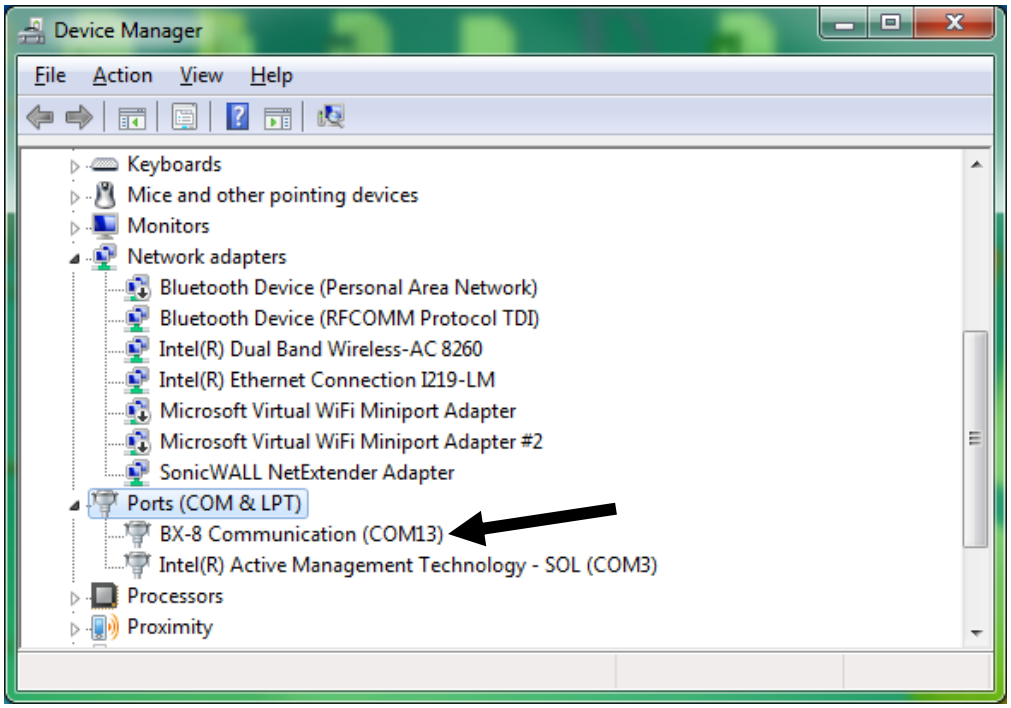


FIGURE 15 - EXAMPLE OF BX8 COMPORT

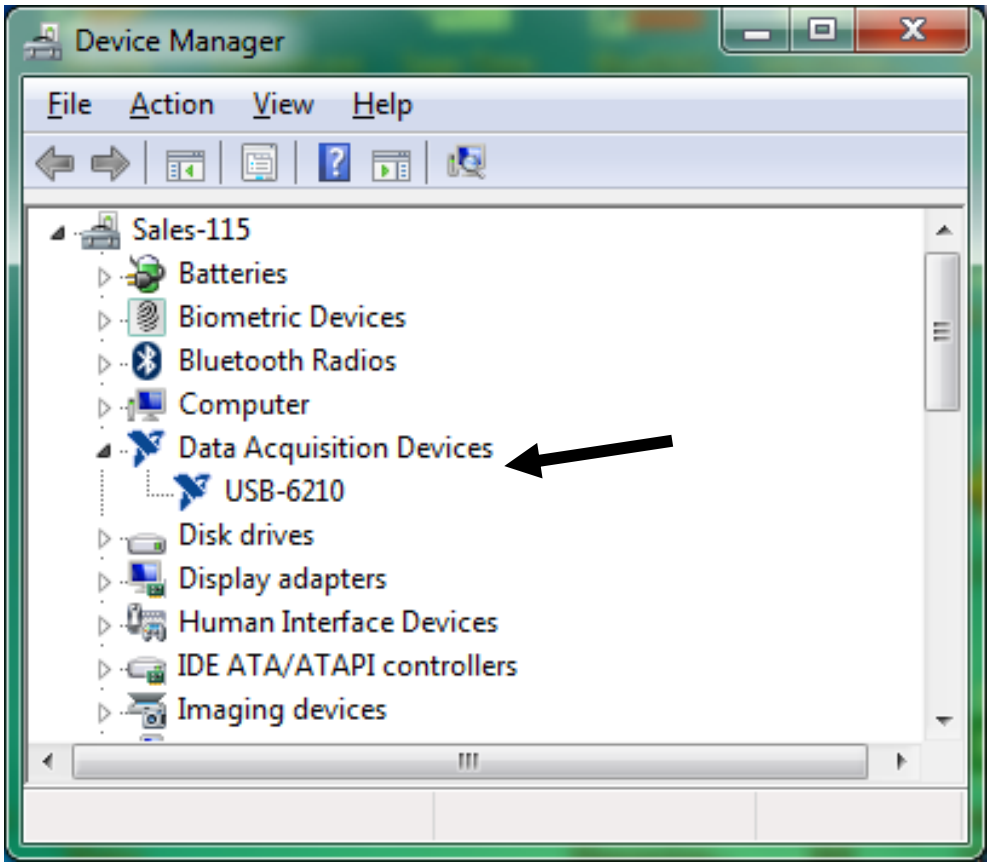


FIGURE 16 - BSC8D INSTALLS AS A DATA ACQUISITION DEVICE

Adding a Single Channel

1. Run BlueDAQ from the start menu. After the program launches click “ADD CHANNEL”

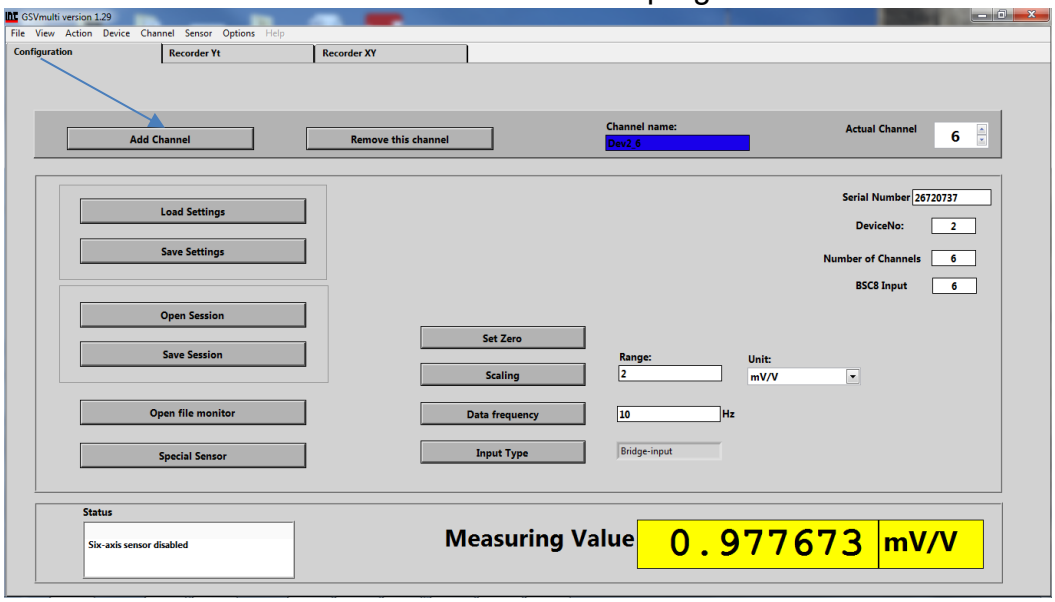


FIGURE 17 - ADD CHANNEL

2. In the Add Channel dialog box
   2.1. Click Devicetype drop-down and select BSC4, BSC8, BX8, or BSC2 (9330)

   2.2. Click the Device dropdown box and select the device, select the COM Port (See Device Manager if unknown) and open the correct amount of input channels (First = 1 and Last = total # of channels for device). For Model 9330, you will not be allowed to change the number of channels. If using the BSC8/BX8 with a 6-axis sensor then stop after opening 6 channels and proceed to step 6.12.

2.3. Click Connect

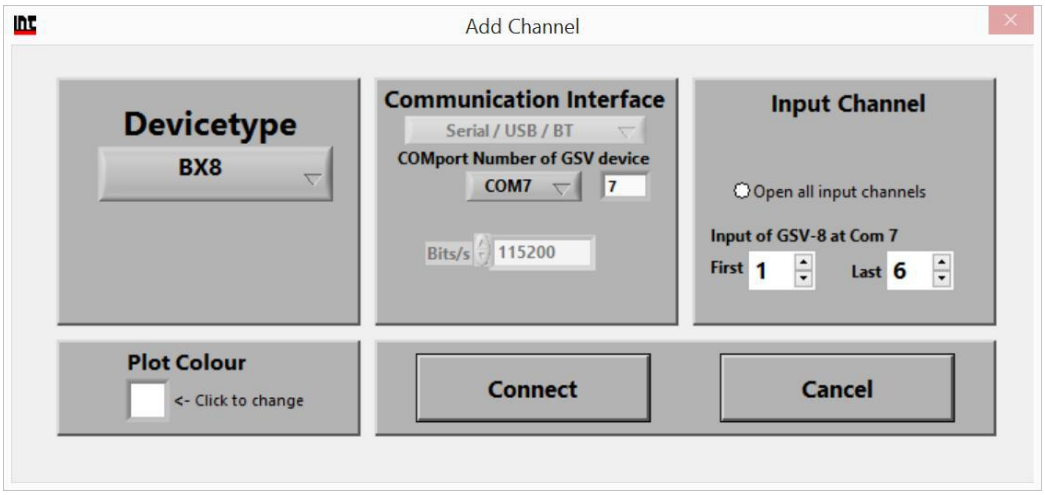


FIGURE 18 - ADD CHANNEL MENU

3. BSC8 has a slightly different add channel box. Select Dev1 instead of Com port. Please remember to open the needed amount of input channels.

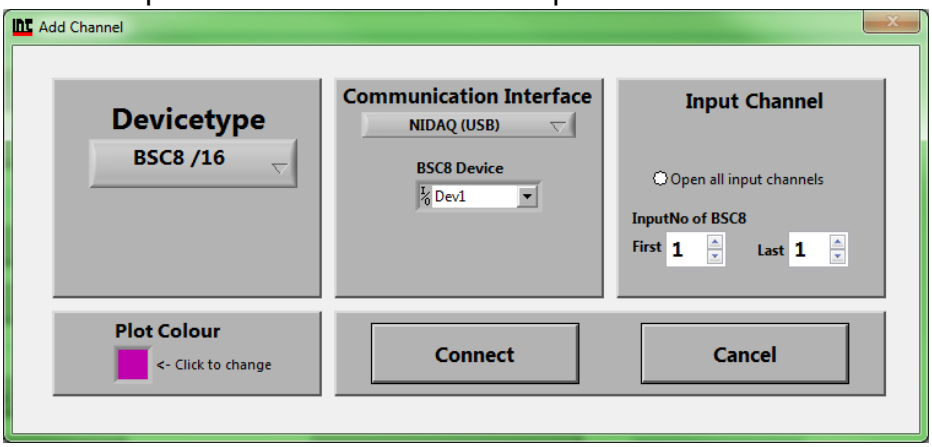


FIGURE 19 - EXAMPLE BSC8 DEVICE

4. Each channel must now be scaled using the “SCALING” dialog box. Each channel must be scaled independently. If the BSC8 was purchased with Interface load cells and a System Setup and

Scaling then the scaling values will be taken from the “Load Cell / BSC8 Digital Bridge Amplifier Calibration Certificate”

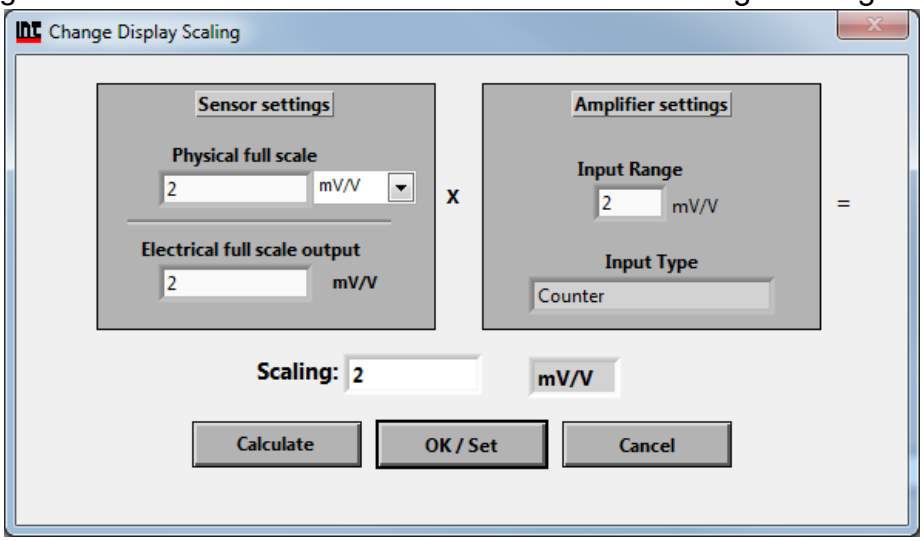


FIGURE 20 - EXAMPLE OF SCALING

4.1. Physical full scale is typically the capacity of the sensor.

4.2. Electrical full scale output is the output of the sensor at the Physical full scale.

4.3. Input Range is always 2 mV/V and should not be changed.

5. Example scaling using Load Cell / BSC8 Digital Bridge Amplifier Calibration Certificate"

interface
ADVANCED FORCE MEASUREMENT

INTERFACE • 7401 E. BUTHERUS DRIVE, SCOTTSDALE, AZ 85260 USA • (800) 947-5598 • (480) 948-5555 • FAX (480) 948-1924
www.interfaceforce.com • gen@interfaceforce.com

Load Cell / BSC8 Digital Bridge Amplifier Calibration Certificate

The sensitivity of the following instrument was programmed or adjusted using a reference mV/V source.

Customer: [redacted]
Address: [redacted]

S.O.: [redacted]
P.O.: [redacted]

Interface, Inc. Model: BSC8D-C12 Serial: R256149

Calibration conditions: Temperature (° F): 74 R.H. (%): 32
mV/V Standard: Interface Model CX-0610 #: 704E NIST Trace: 656414
Calibration Due: Cal Due: 09-Jun-15 *Uncertainty of Standard: 0.001% RDG*

Excitation: 5 VDC

Mode Simulated	Standard (mV/V)	Measured Amplifier Net Reading
Compression	2.0001	102.833

The above sensitivity of the Amplifier is intended for use with the following transducer which, when interconnected, will produce the outputs listed below, based on straight line sensitivity of the Amplifier and best fit line (SEB) outputs of the transducer.

Transducer Mfg: Interface Model: LBS-100-864 Serial: T667819
Transducer--Amplifier Interconnection polarity (Normal [CT Cable] / Reversed [CC Cable]): normal

Mode	Transducer Output (mV/V)	Reference Force (lbf)	Net Reading at Reference Force
Compression	1.94492	100	99.995

Channel: 1

Important: Zero or offset adjustments may be altered by the user without affecting this calibration. Span or gain adjustments must not be disturbed.

Calibration by: Tin Nguyen Date: 20-Feb-15

Results relate to above serial numbers only. Do not reproduce this report except in full or with Interface, Inc. written approval.

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FIGURE 21 - CALIBRATION DATA SHEET – AMPLIFIER CALIBRATION CERTIFICATE

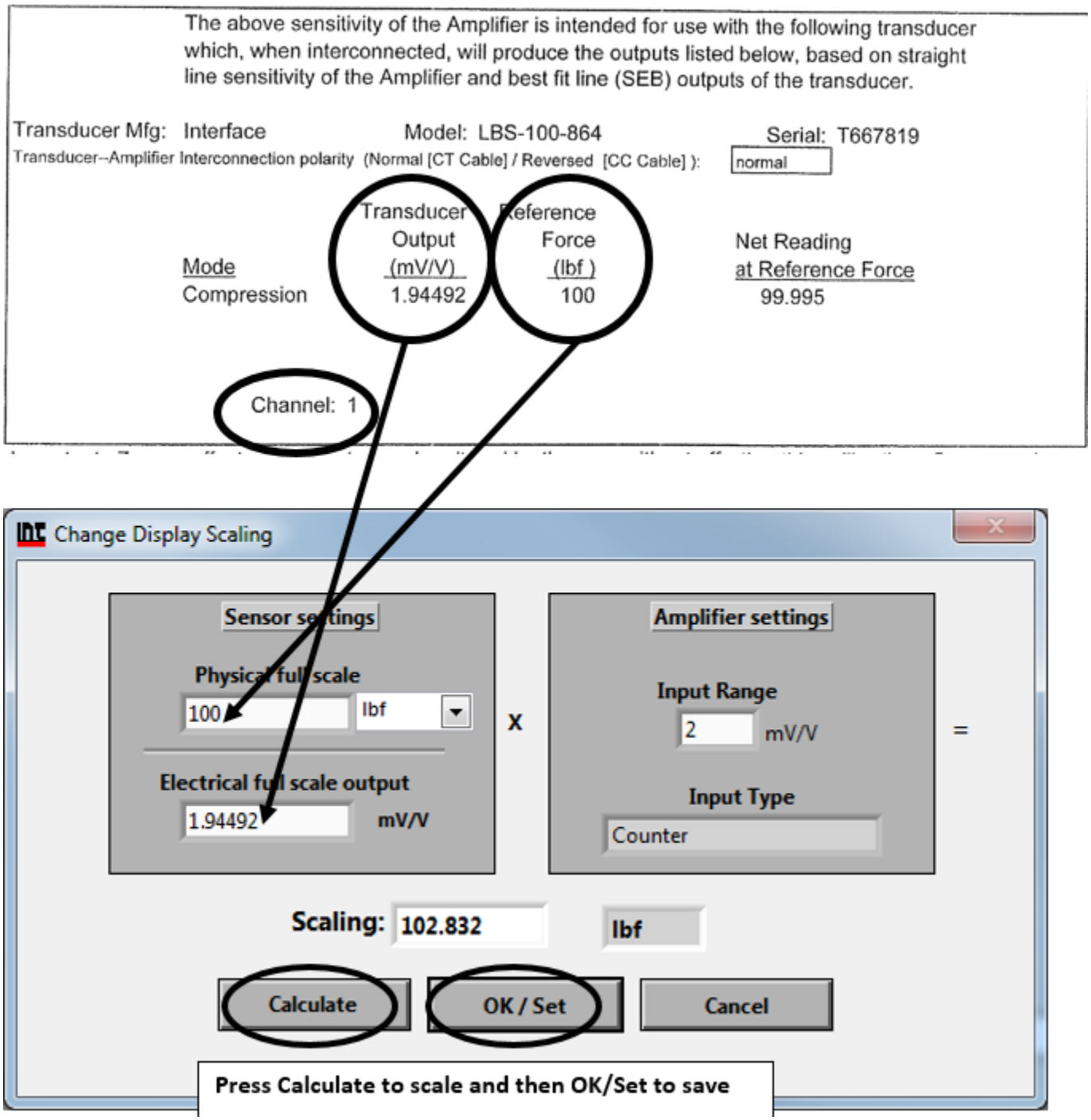


FIGURE 22 - SCALING USING CALIBRATION CERTIFICATE

6 Example scaling a channel using model WMC-100 load cell with 100 lbf capacity and 1.9587 mV/V output. After entering the values into the dialog box you must click “Calculate” and then “OK/Set”.

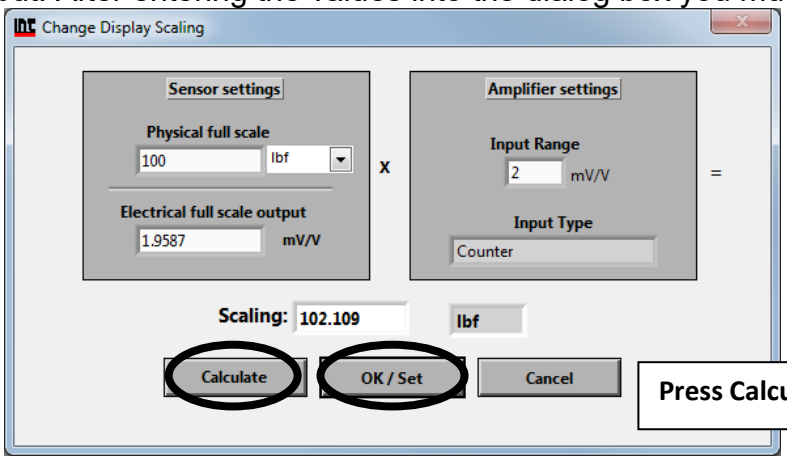
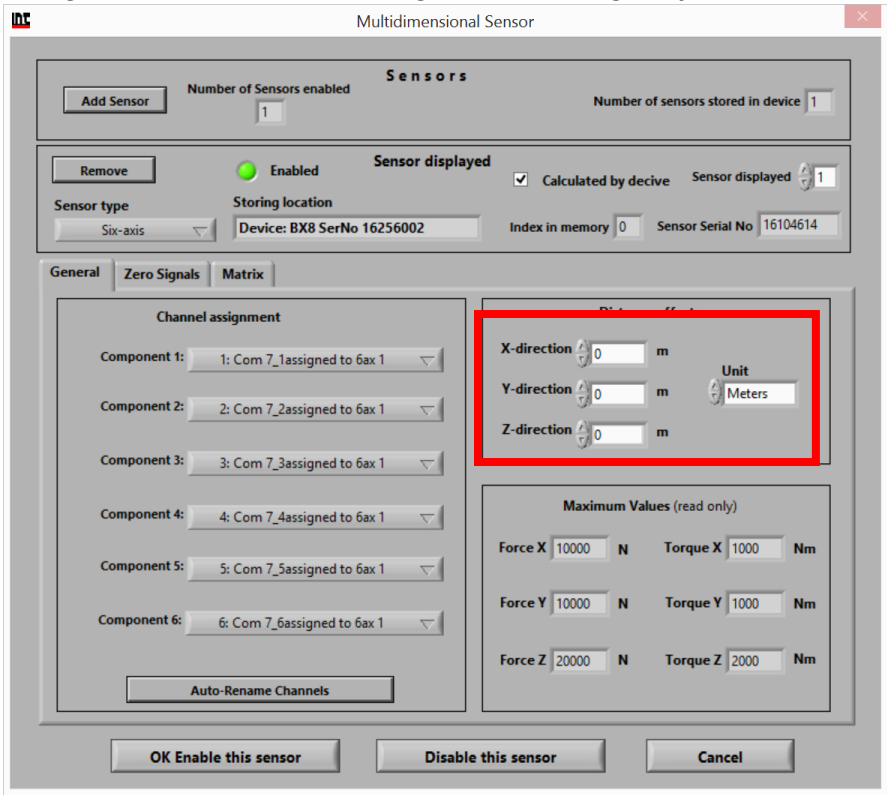


FIGURE 23 - EXAMPLE OF CALIBRATION FOR A WMC-100 LOAD CELL

Distance Offset

1. To change the distance of the origin, this setting may be access in the sensor option



2. Select the corresponding direction and the distance.
3. Can be set in meters or millimeters.

Measurement and Recording

1. Click Set All Zero before measuring

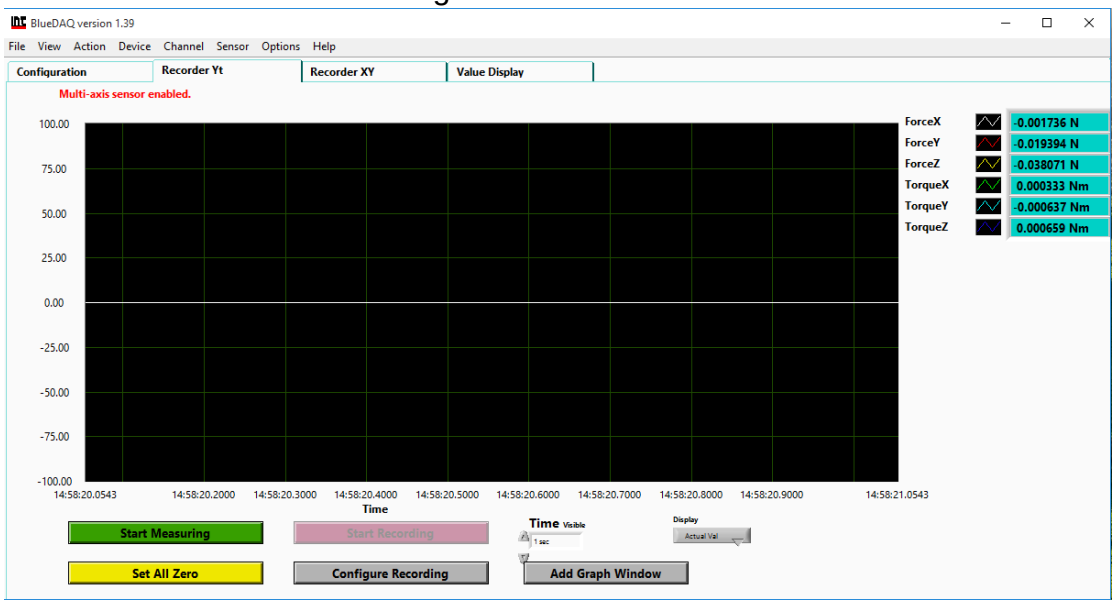


FIGURE 24 - ZERO VALUES

2. Click YES

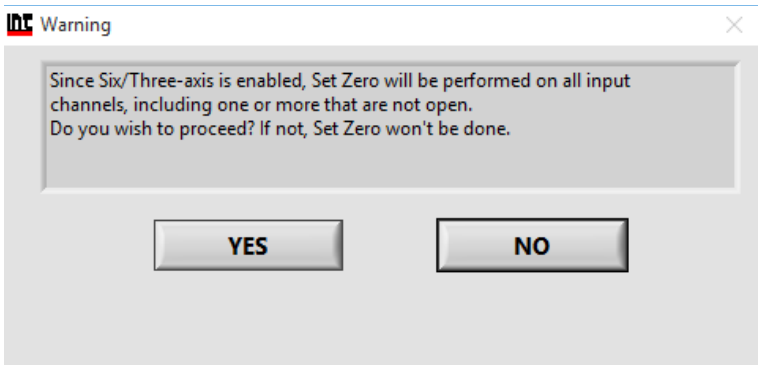


FIGURE 25 – PROCEED WITH ZERO RESET

3. Click OK to Start Measuring

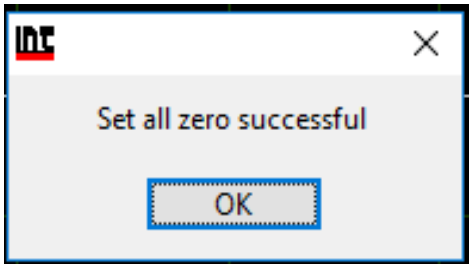


FIGURE 26 - SUCCESSFUL ZERO

4. Click Start Measuring

FIGURE 27 - MEASUREMENT

5. Recording Options are available.

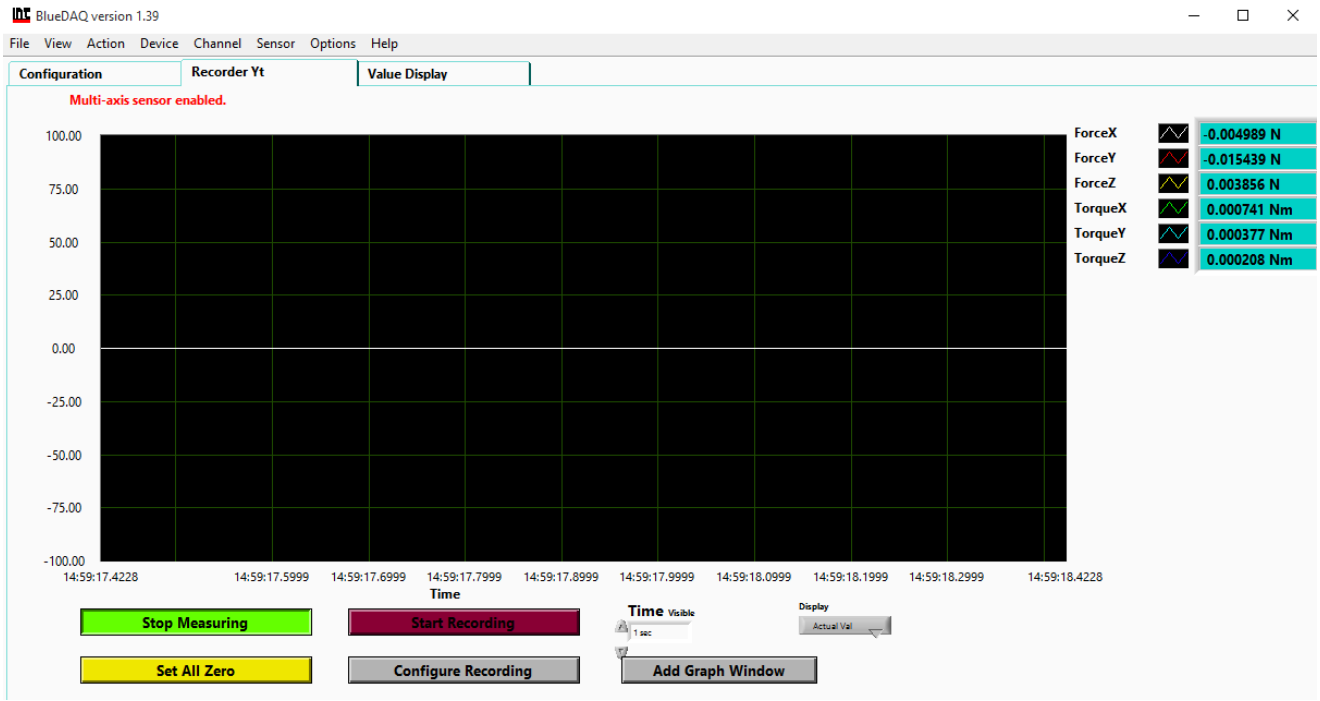


FIGURE 28 - MEASUREMENT INITIATED

6. Recorder Tab, measurements of all Axis.

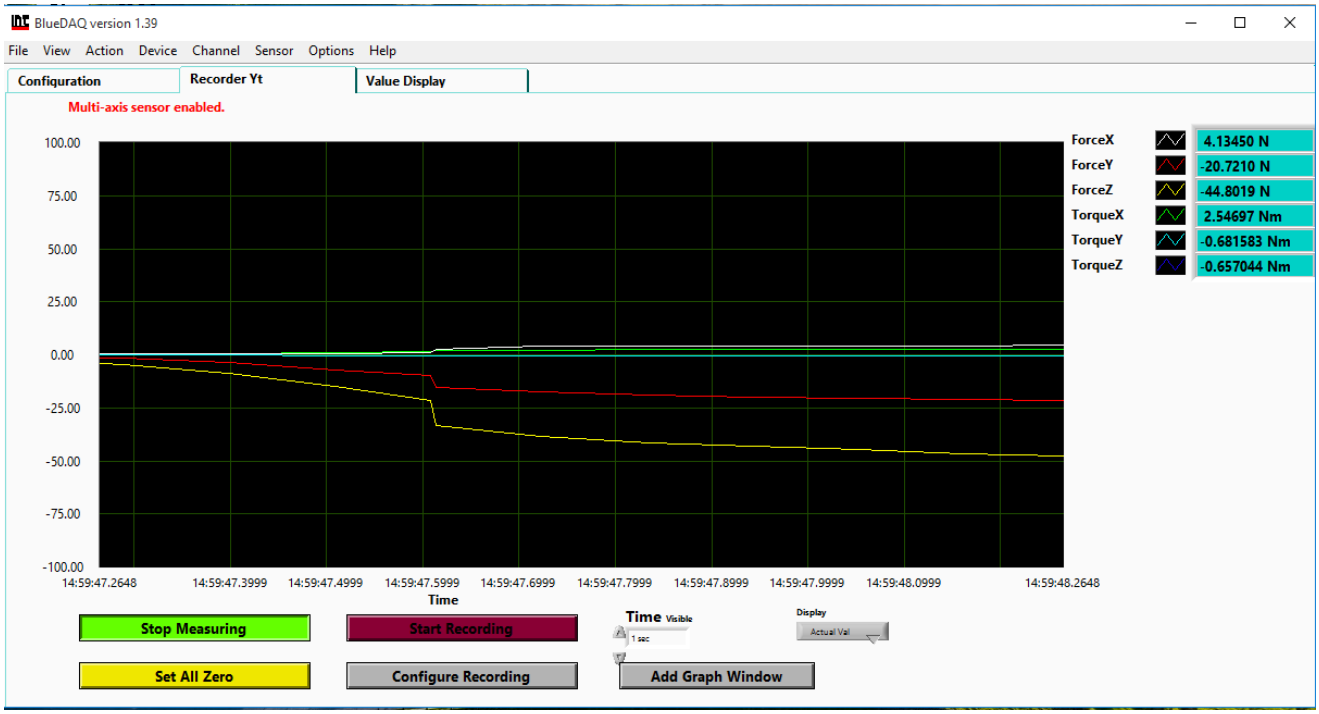


FIGURE 29 - VALUES MEASURED

7. Value Display shows values in each Axis.

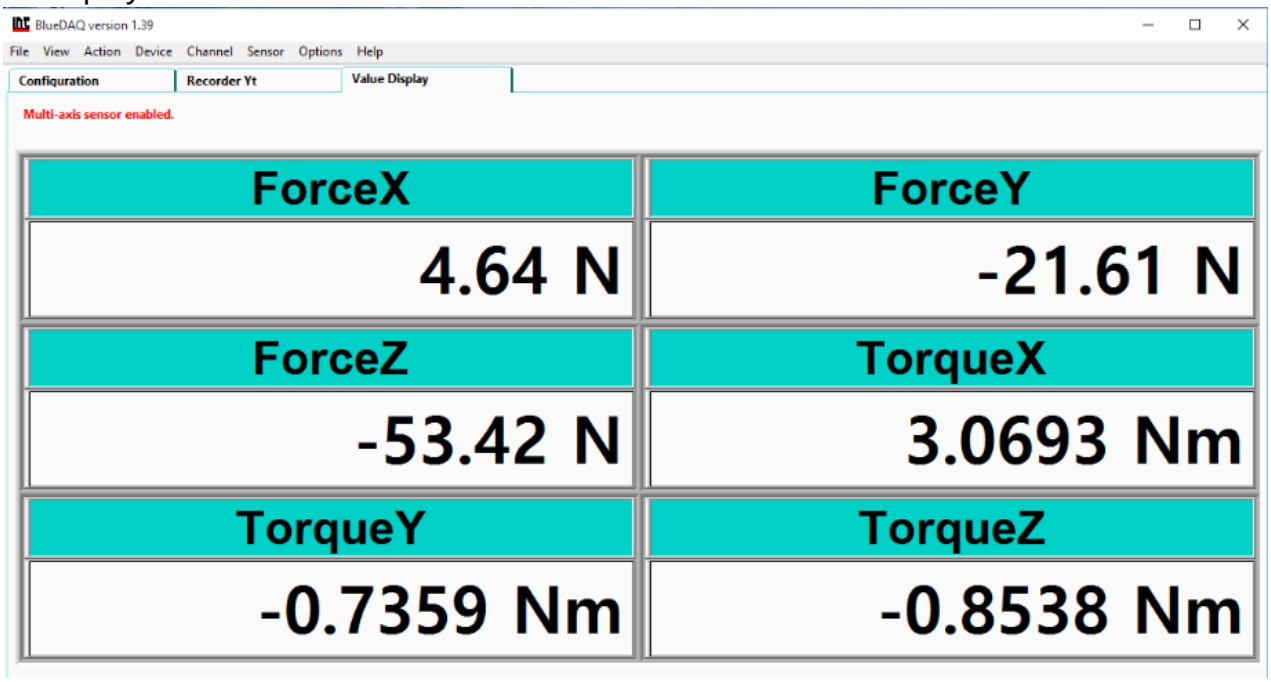


FIGURE 30 - VALUE DISPLAY SCREEN

BlueDAQ Menus

File

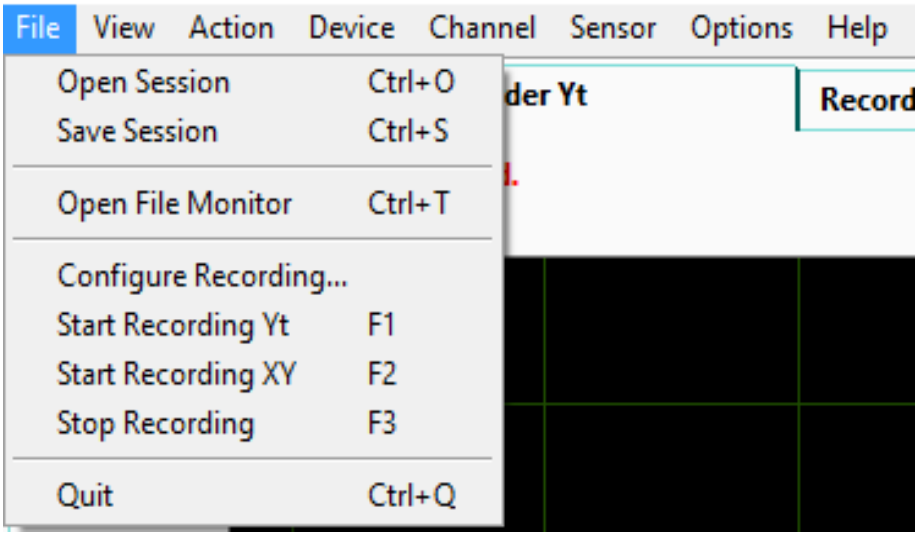


FIGURE 31 - FILE

1. Open Session allows you to open a previous session and start where you left off.

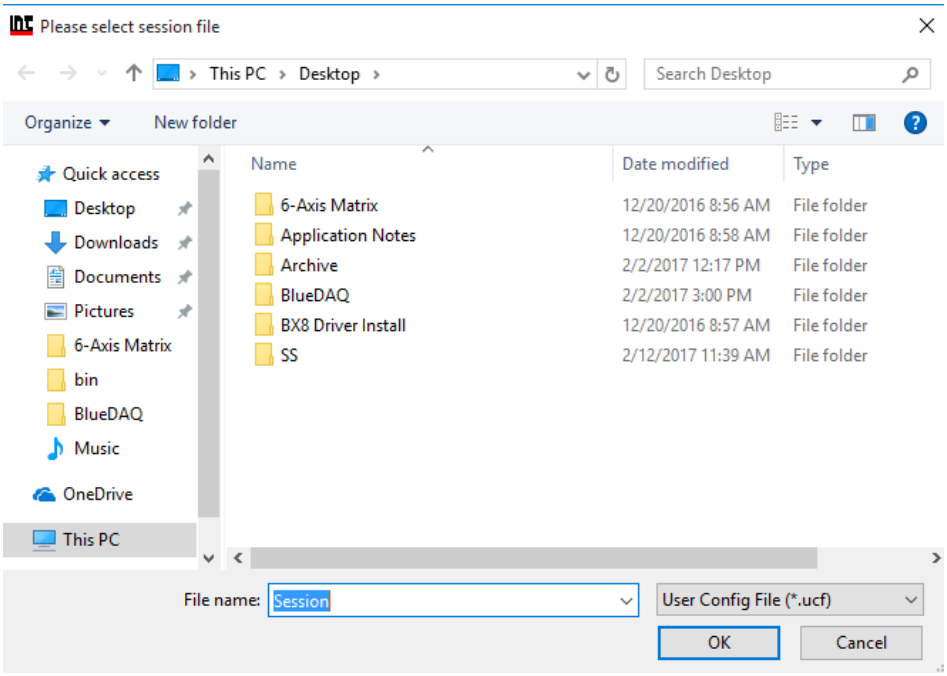


FIGURE 32 - OPEN SESSION

2. Save Session allows you to save your session

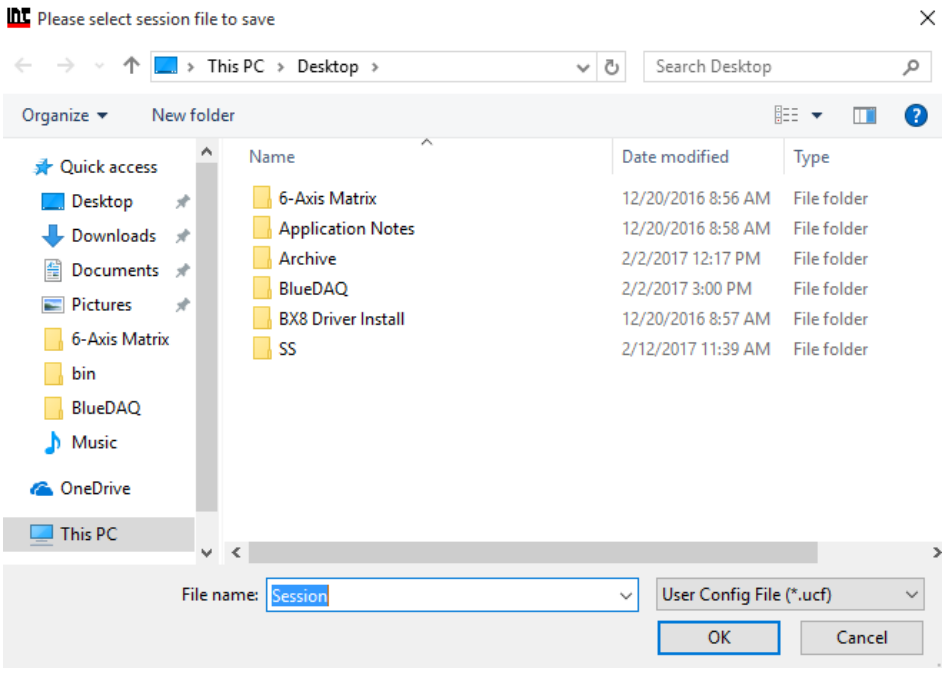


FIGURE 33 - SAVE SESSION

3. Open File Monitor allows you to open previous monitor file.

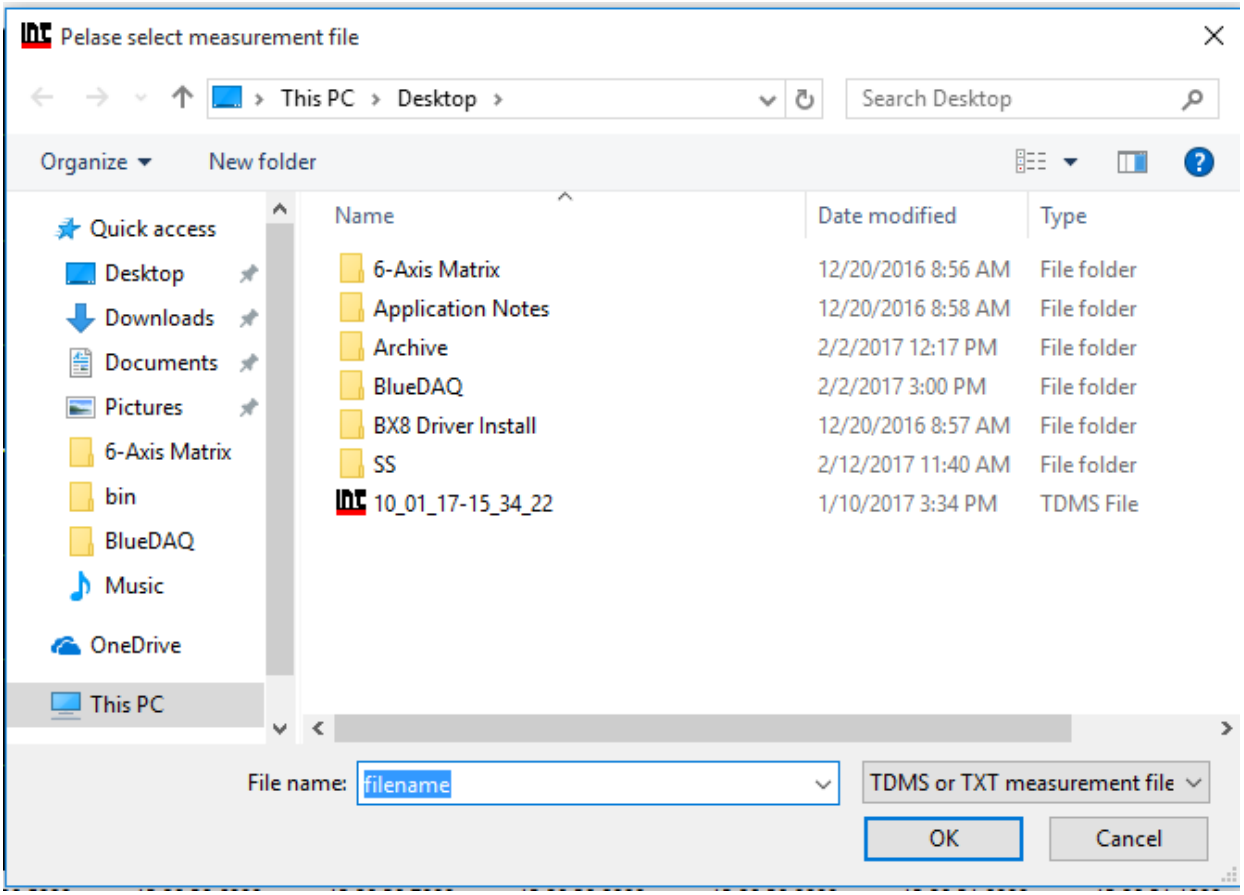


FIGURE 34 - OPEN FILE MONITOR

4. Configure Recording
   4.1. Save Memory Data, allows you to save data of the recorded value.
      A. All available values
      B. Number of values
      C. Available Last Time
      D. Data Available

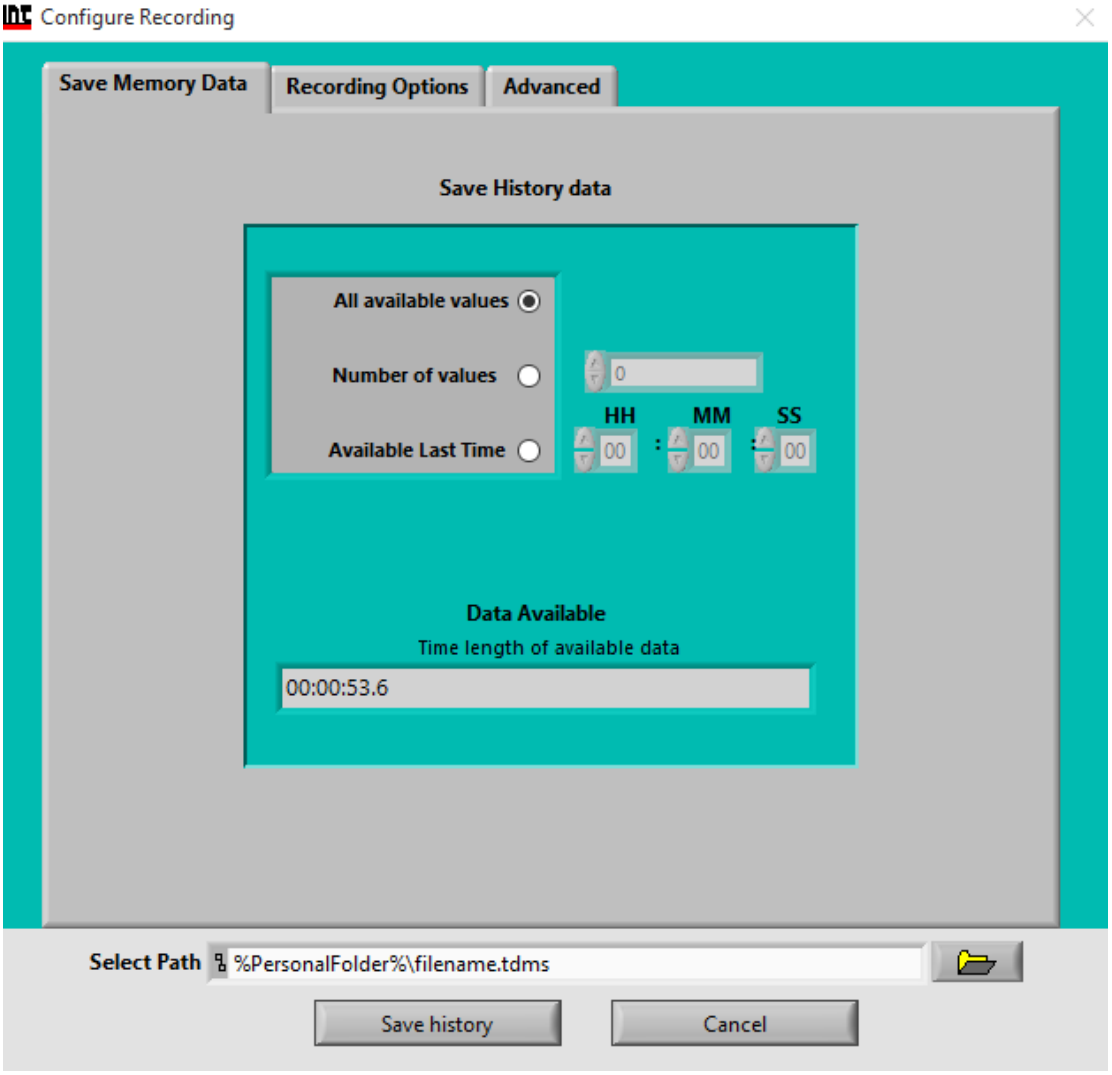


FIGURE 55 - SAVE MEMORY DATA

4.2. Recording Options

A. Manually allows you to choose the run and stop time of recording.

B. Automatically will choose the run and stop time.

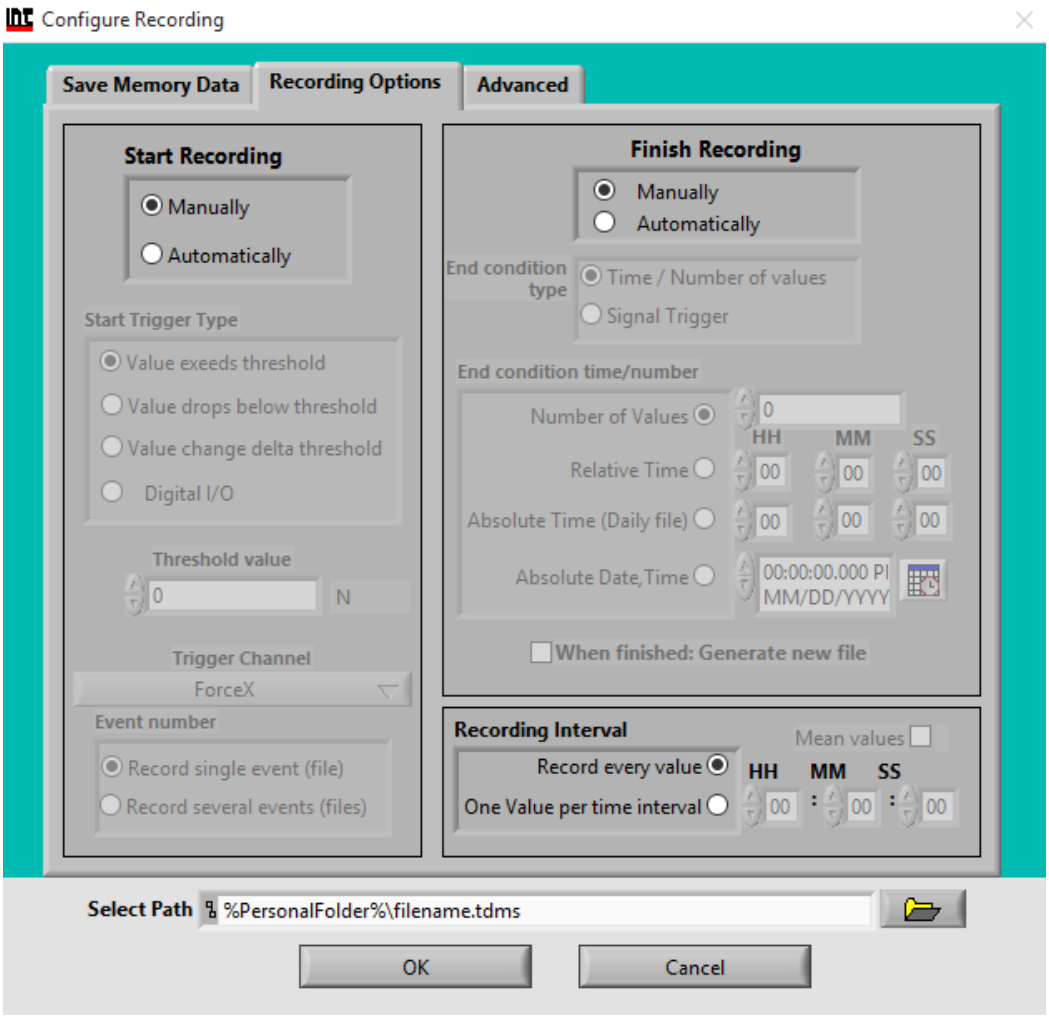


FIGURE 35 - RECORDING OPTIONS

4.3. Advanced

A. Allows you to choose the timestamp, record hidden channels and create a second file with filters.

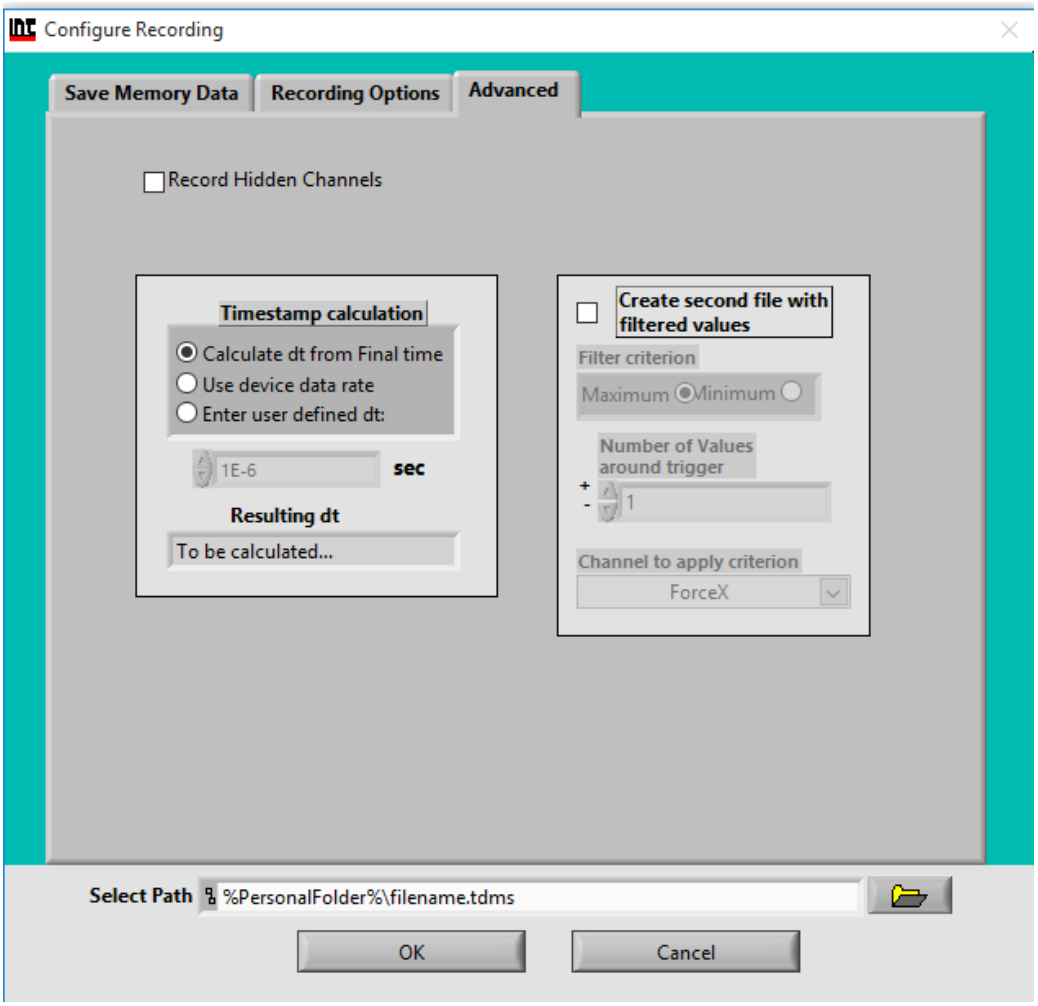


FIGURE 36 - ADVANCED

View

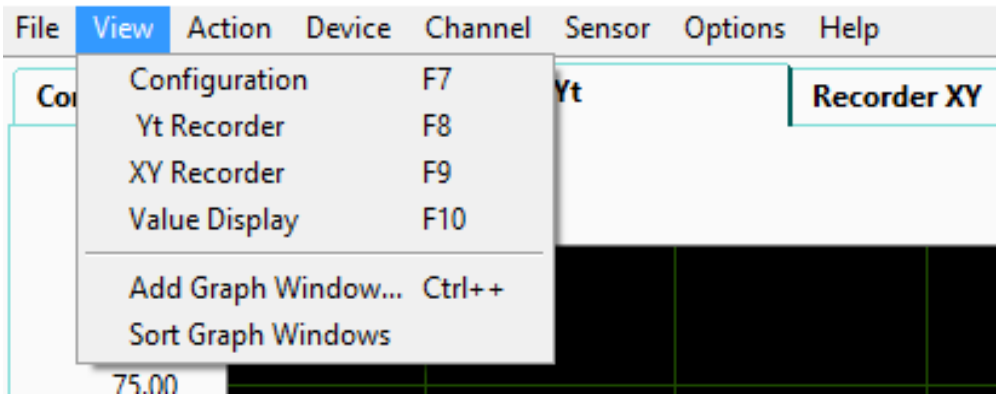


FIGURE 37 – VIEW

1. Configuration
    1.1.1. Allows configurations of Axis to be viewed.

2. Yt Recorder
    2.1. Shows only the Yt Axis

3. XY Recorder
    3.1. Shows only the XY Axis

4. Value Display
    4.1. Shows all Axis and values

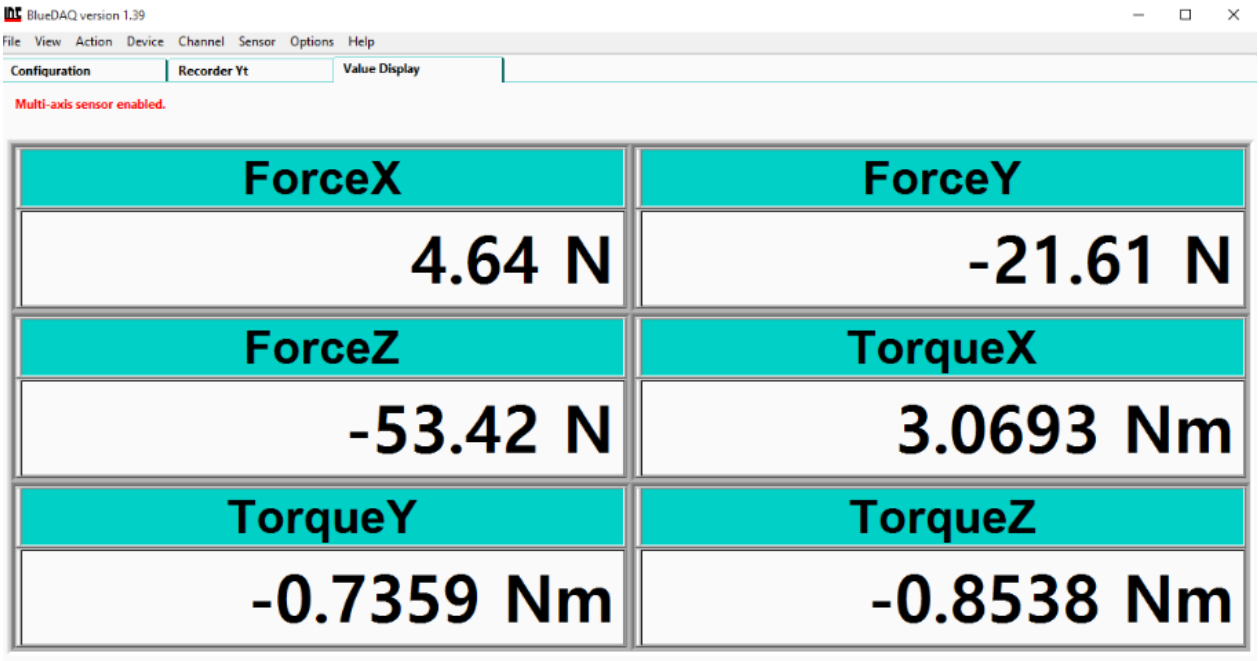


FIGURE 38 - VALUE DISPLAY

5. Add Graph Window

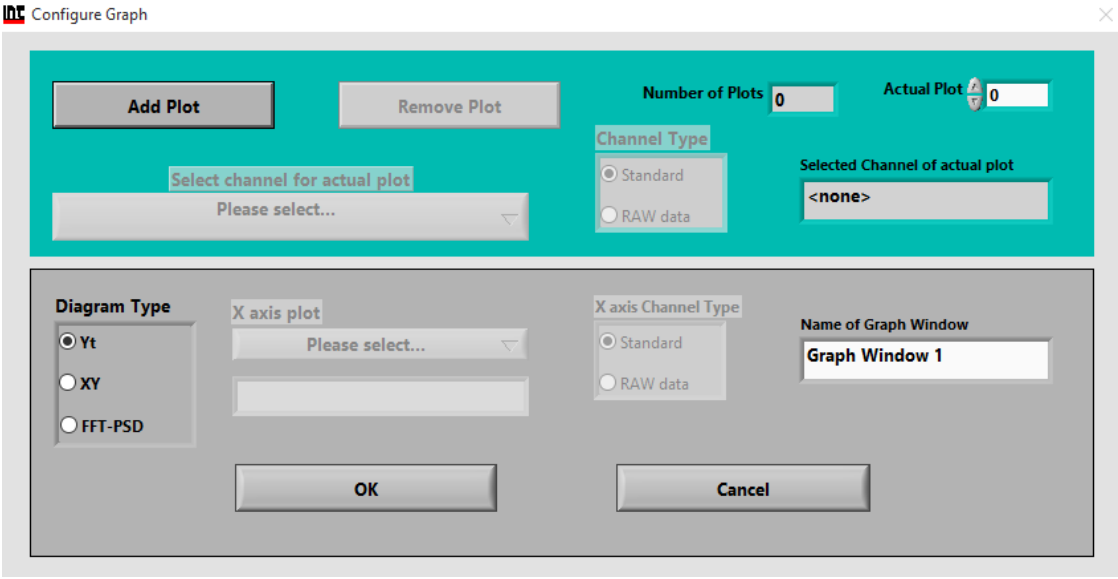


FIGURE 39 - ADD GRAPH WINDOW

5.1. Add Plot

A. Allows you to add an Axis to the graph.

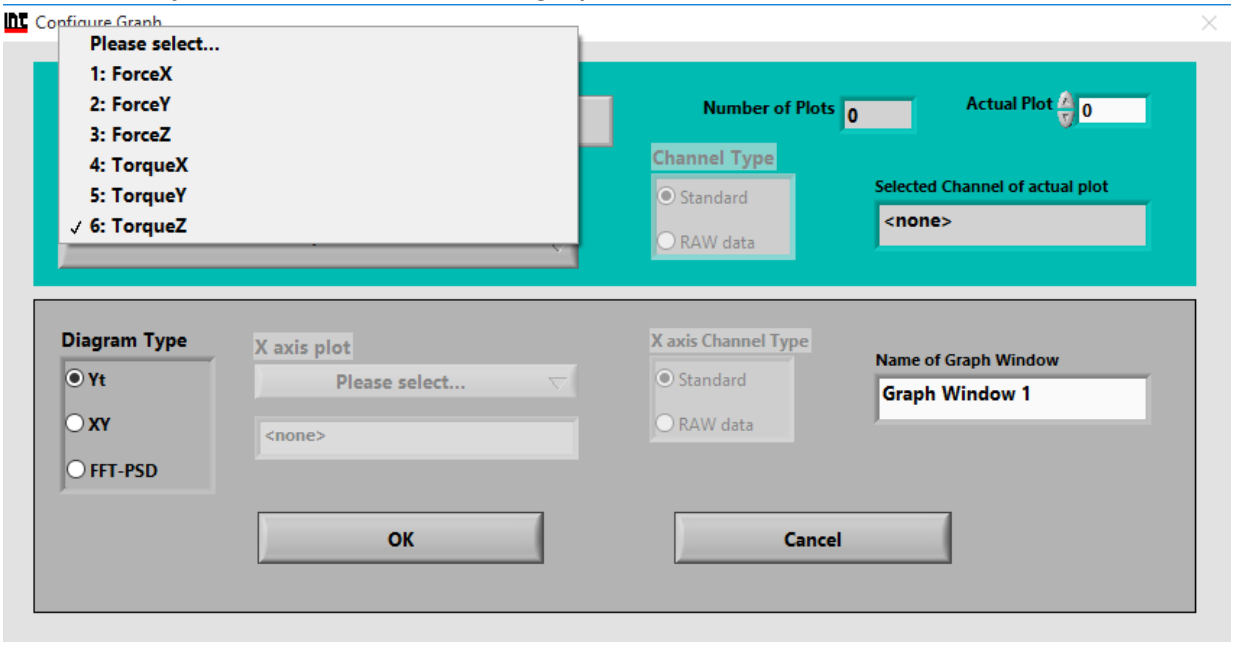


FIGURE 40 - ADD PLOT

6. Sort Graph windows

6.1. Sort between graphs

Action

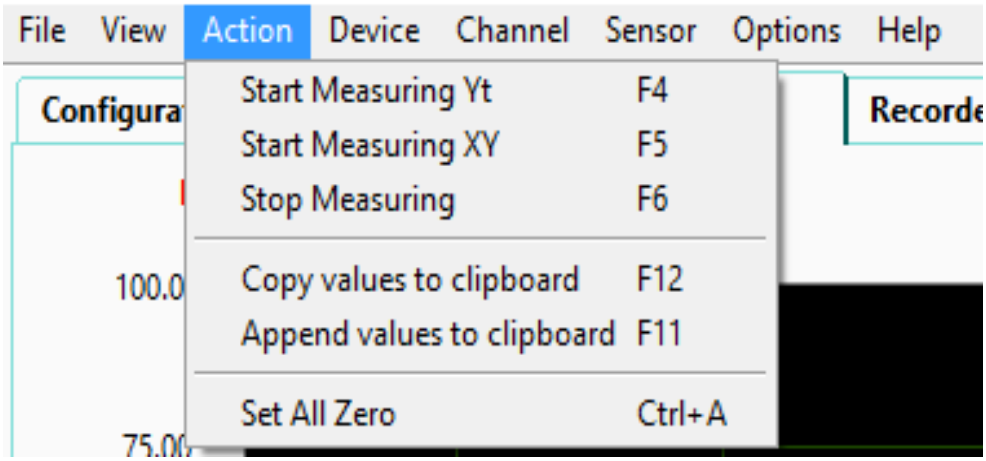


FIGURE 41 - ACTION

1. Start Measuring Yt - Measures only the Yt axis.
2. Start Measuring XY - Measures only the XY Axis.
3. Stop Measuring - Stops measurement.
4. Copy Values to clipboard - Copies the last data measured.
5. Append values to clipboard - Add values to be copied.
6. Set All Zero - Sets all Values to Zero.

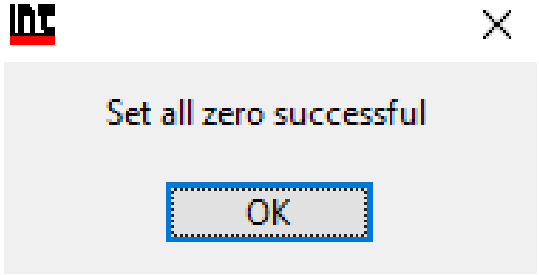


FIGURE 42 - SET ALL ZERO

Device

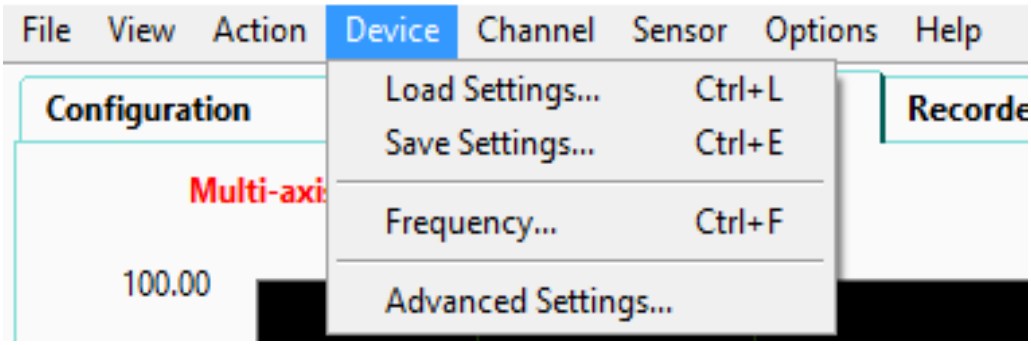


FIGURE 43 – DEVICE

1. Load Settings

1.1. Load Settings from a Custom or Previous Setting

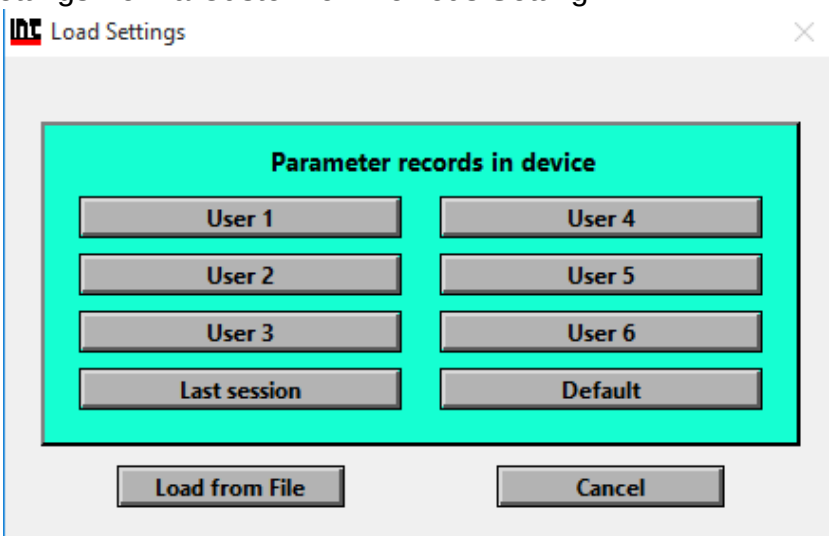


FIGURE 44 - LOAD SETTINGS

1.2. Load from File

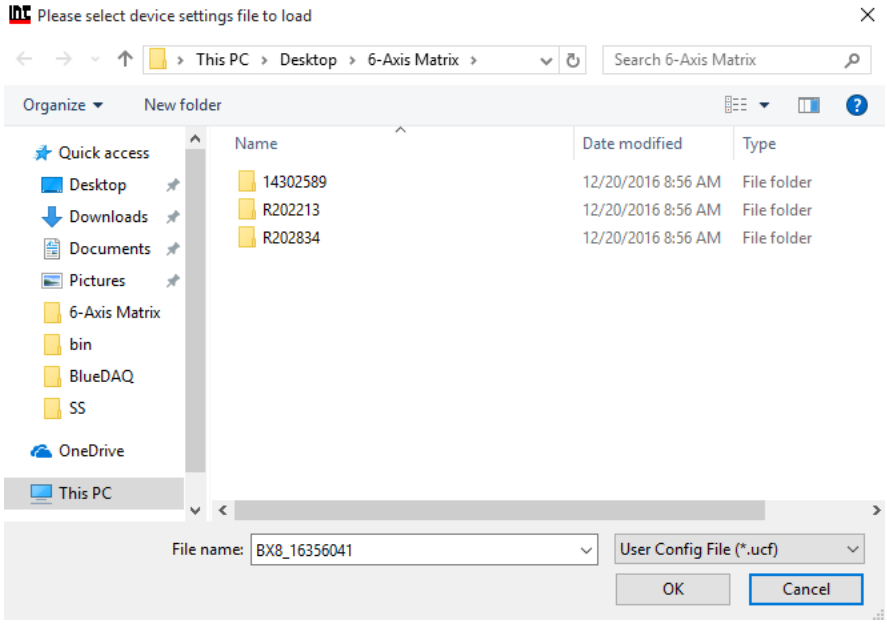


FIGURE 45 - LOAD FROM FILE

2. Save Settings - Save current settings.

3. Frequency - Frequency rate of each record value per second.

3.1. Using low settings such as 1Hz or 0.1Hz may provide a stable reading, but slower refresh rate.

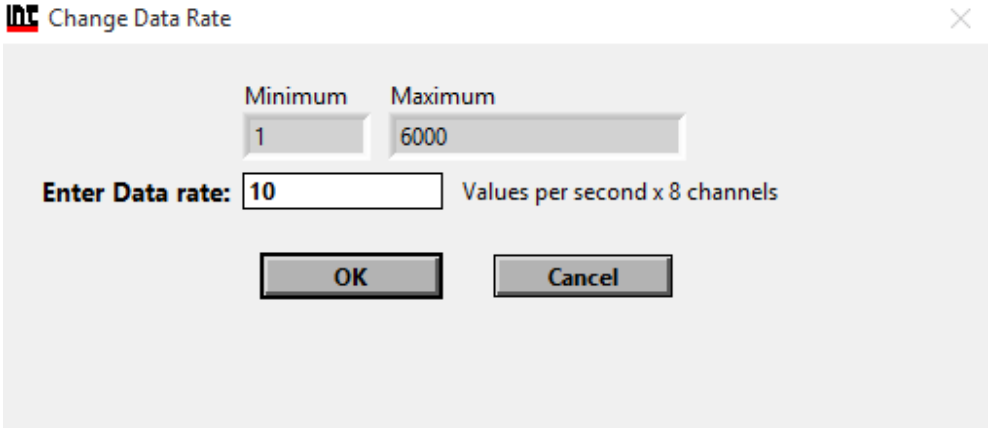


FIGURE 46 - FREQUENCY

4. Advanced Settings

4.1. Filter

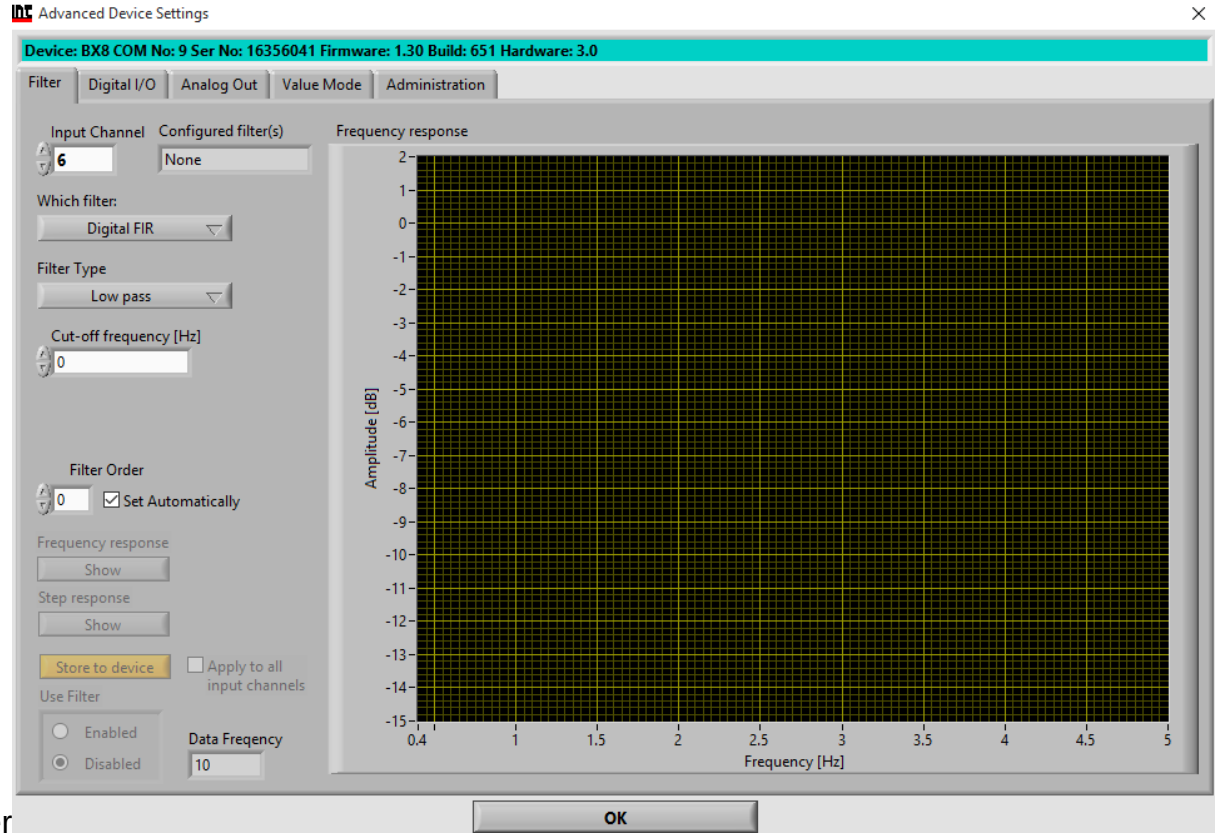


FIGURE 47 - FILTER

4.1.1. Input Channel – Digital Filters are individually configurable for each of the 8 analog input channels. Select input channel here. Do this first, if the filter is not yet configured.

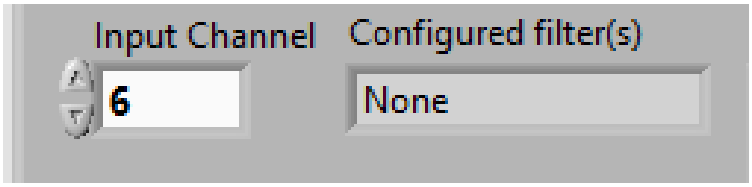


FIGURE 48 - INPUT CHANNEL

4.1.2. Which Filter

FIGURE 49 - WHICH FILTER

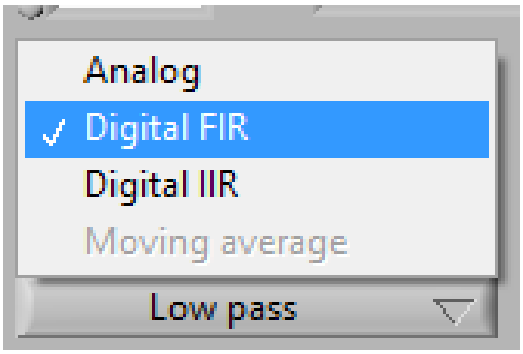


FIGURE 50 - FILTERS

A. Analog is the frontend low-pass filter

B. FIR is a Finite-Impulse-Response digital Low pass filter

C. IIR is an Infinite-Impulse-Response digital filter with selectable type.

4.1.3. Filter Type – Can only set if “Which filter” is set to IIR.

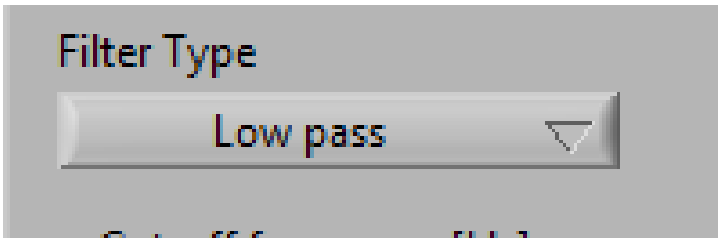


FIGURE 51 - FILTER TYPE

A. Low Pass frequencies above Cut-off are damped.

B. High Pass, frequencies below Cut-off are damped.

C. Band Pass, frequencies below Lower Cut-off and above Upper Cut-off are damped.

D. Band Stop, frequencies between Lower and Upper Cut-off are damped.

4.1.4. Cut-off frequency (Hz)

A. Cut-off frequency in Hz, where the signal is damped by -3dB. Lower Cut-off with Band pass and Band stop type.

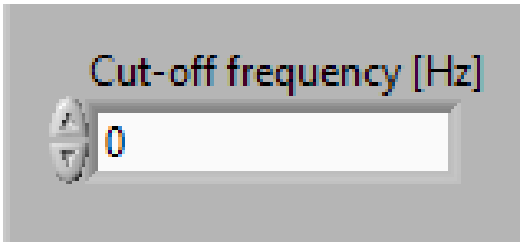


FIGURE 52 - CUT OFF FREQUENCY

4.1.5. Filter Order

A. Settable for FIR Filter only
B. Higher order leads to steeper damping characteristics, but slower step response.
C. Lower cut-off frequency is possible with higher order, higher cut-off with lower order.

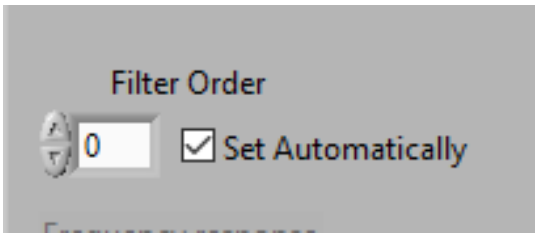


FIGURE 53 - FILTER ORDER

4.1.6. Frequency response

A. Calculate filter and show results in frequency domain of sine waves at the input of different frequencies if successful.
B. Especially with IIR High pass. Band pass and Band stop, observe the graph carefully for instability: A stable freq. response of an IIR filter is generally continuous and should never exceed 0dB.

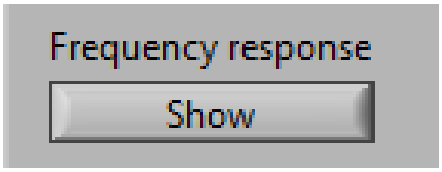


FIGURE 54 - FREQUENCY RESPONSE

4.1.7. Step response

A. Show filter output signal in time domain of standard step from 0 to nominal value at the input at time=0.
B. Useful for determining settling time, e.g. for high-order FIR filter.

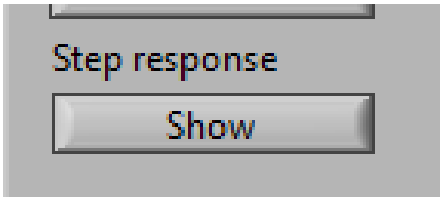


FIGURE 55 - STEP RESPONSE

4.1.8. Store to device

A. Calculate filter and store all necessary information in the device if the calculation is successful. The same settings will be stored for all 8 inputs if “Apply to all input channels” is checked.

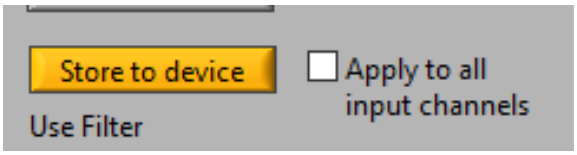


FIGURE 56 – STORE TO DEVICE

4.1.9. Use Filter

A. Enable or disable this filter. Even if disabled, all other filter settings will remain stored in device (if no error occurred), if they are already stored.

B. This filter will be enabled/disabled for all 8 inputs channels if “Apply to all channels” is checked.

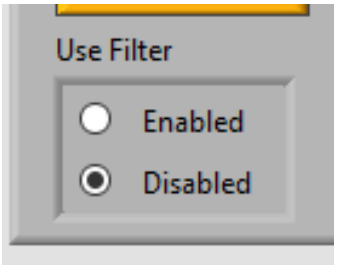


FIGURE 57 - USE FILTER

4.2. Digital I/O

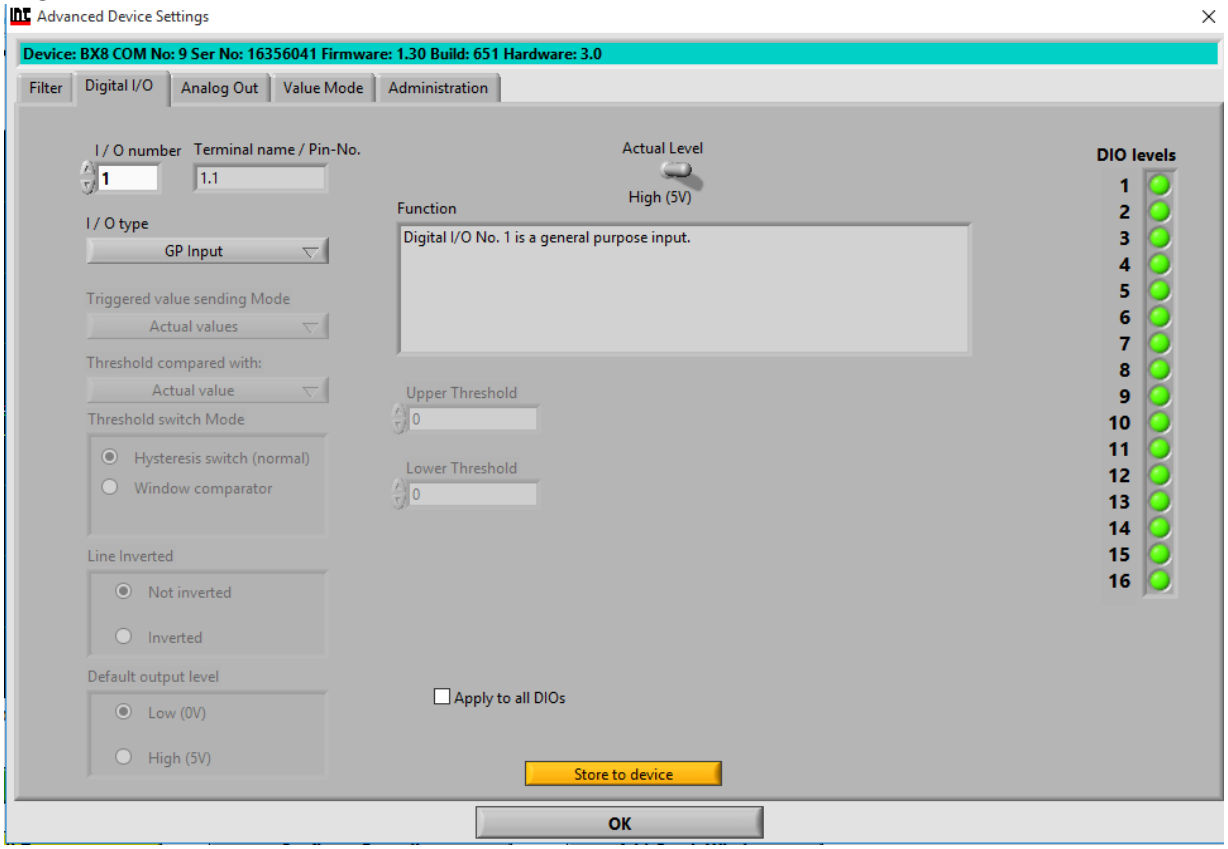


FIGURE 58 - DIGITAL I/O

4.3. I/O number

4.3.1. Devices can have up to 16 digital I/O lines. Enter number of digital I/O here.

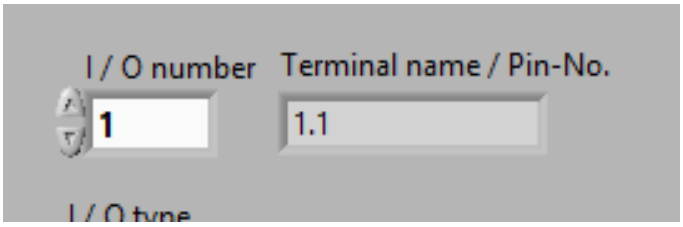


FIGURE 59 - I/O NUMBER

4.3.2. I/O type

A. GP Input – “General Purpose” Input

B. Tare Single – Zero out.

C. Tare All – Zero all.

D. Reset Max/Min

E. Trigger Send value
   i. Actual Values
   ii. Maximum Values
   iii. Minimum Values
   iv. Mean Values

F. GP Output – “General Purpose” Output

G. Threshold Switch

4.3.3. Threshold switch Mode – Only Activated if Threshold Switch is selected in I/O type.
   A. Hysteresis switch (normal) – Digital output becomes active if measuring value of corresponding channel is above ON-threshold. It becomes inactive if measuring value of corresponding channel is blow OFF-threshold.
   B. Window comparator – Digital output becomes active if measuring value of corresponding channel is between upper and lower threshold, otherwise inactive.

4.3.4. Line Inverted
   A. Not inverted – Active level is logical high = 5V. Inactive logical low is 0V.
   B. Inverted – Active level is logical low – 0V. Inactive logical high is 5V.

4.3.5. Default output level – Level which digital I/O will output by default. That applies to all DIO output types after power-on, before a set output condition occurs.
   A. E.g. set output level command if GP output type.

4.4. Analog Out

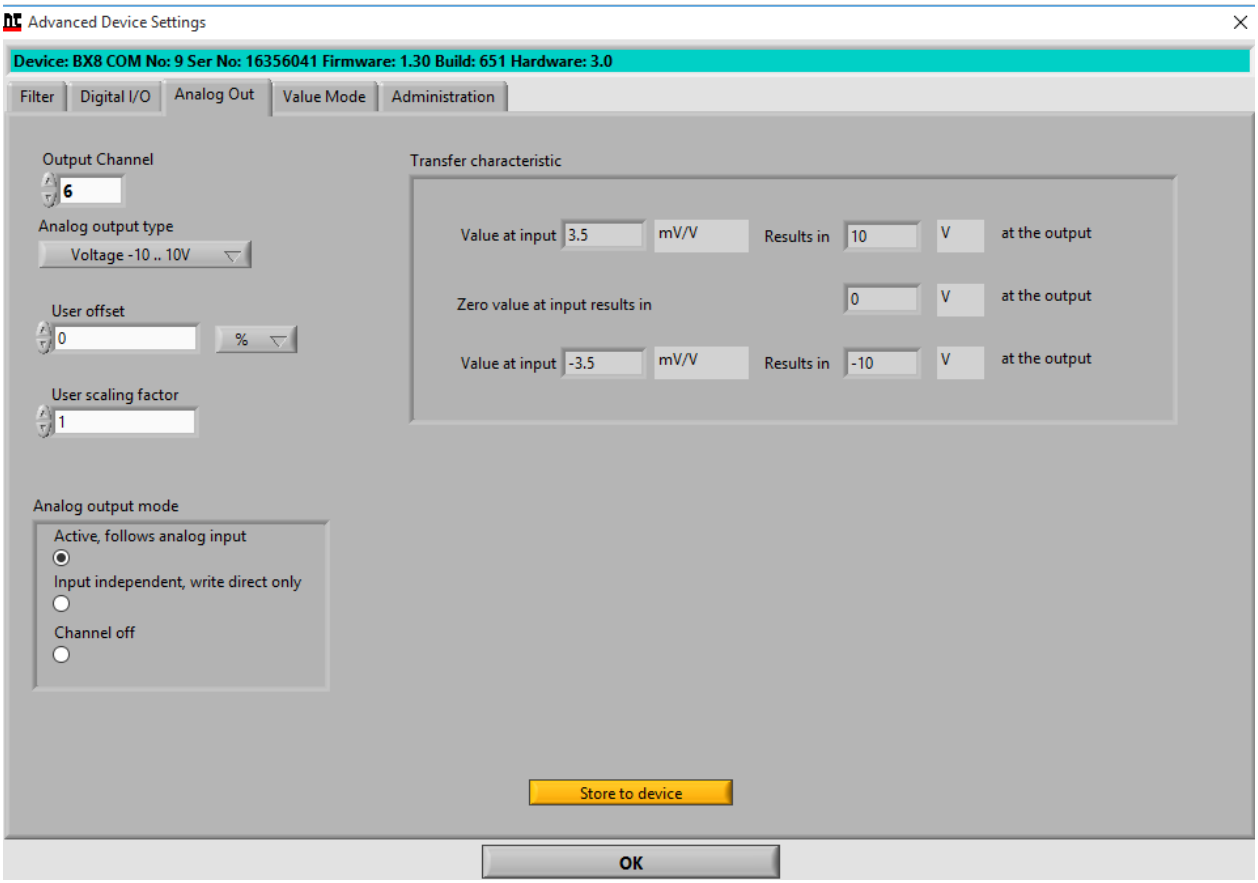


FIGURE 60 - ANALOG OUT

4.4.1. Output Channel – Analog output type, voltage or current.

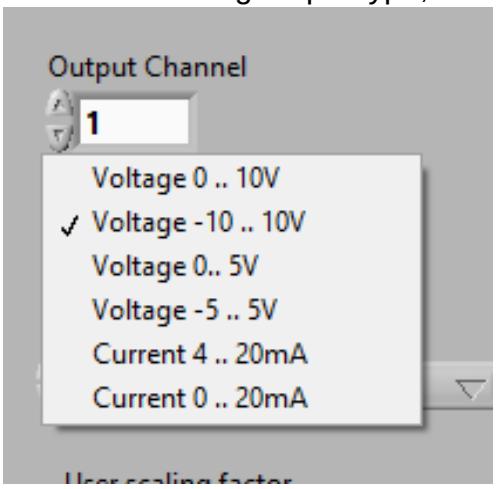


FIGURE 61 - OUTPUT CHANNEL

4.4.2. User offset – Additional offset in percent, which defines output value at zero analog input value.

A. E.g. if set to 50%, analog out value will be half of the positive range.
B. 2.5V at 0-5V or ±5V.

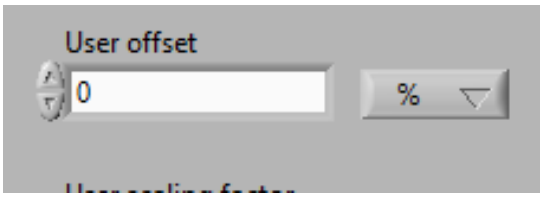


FIGURE 62 - USER OFFSET

4.4.3. User scaling factor – Scaling factor to adapt analog input physical values to analog output.

A. If using User offset, set User offset first, then User scaling.

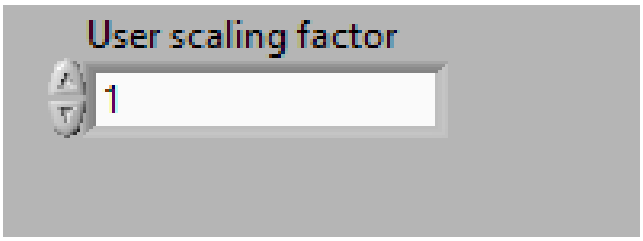


FIGURE 63 - USER SCALING FACTOR

4.4.4. Analog output mode

A. Active, follows analog input – Output value depends on setting and analog input value of the same input channel number.
B. Input independent, write direct only – Use analog output DAC directly.
C. Channel off – Channel switch is off.

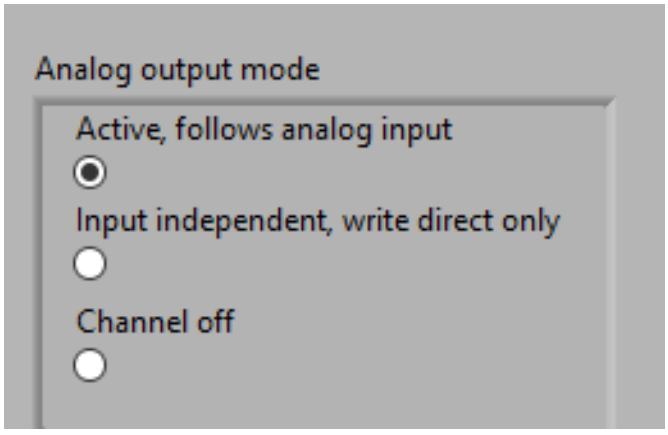


FIGURE 64 - ANALOG OUTPUT MODE

4.5. Value Mode

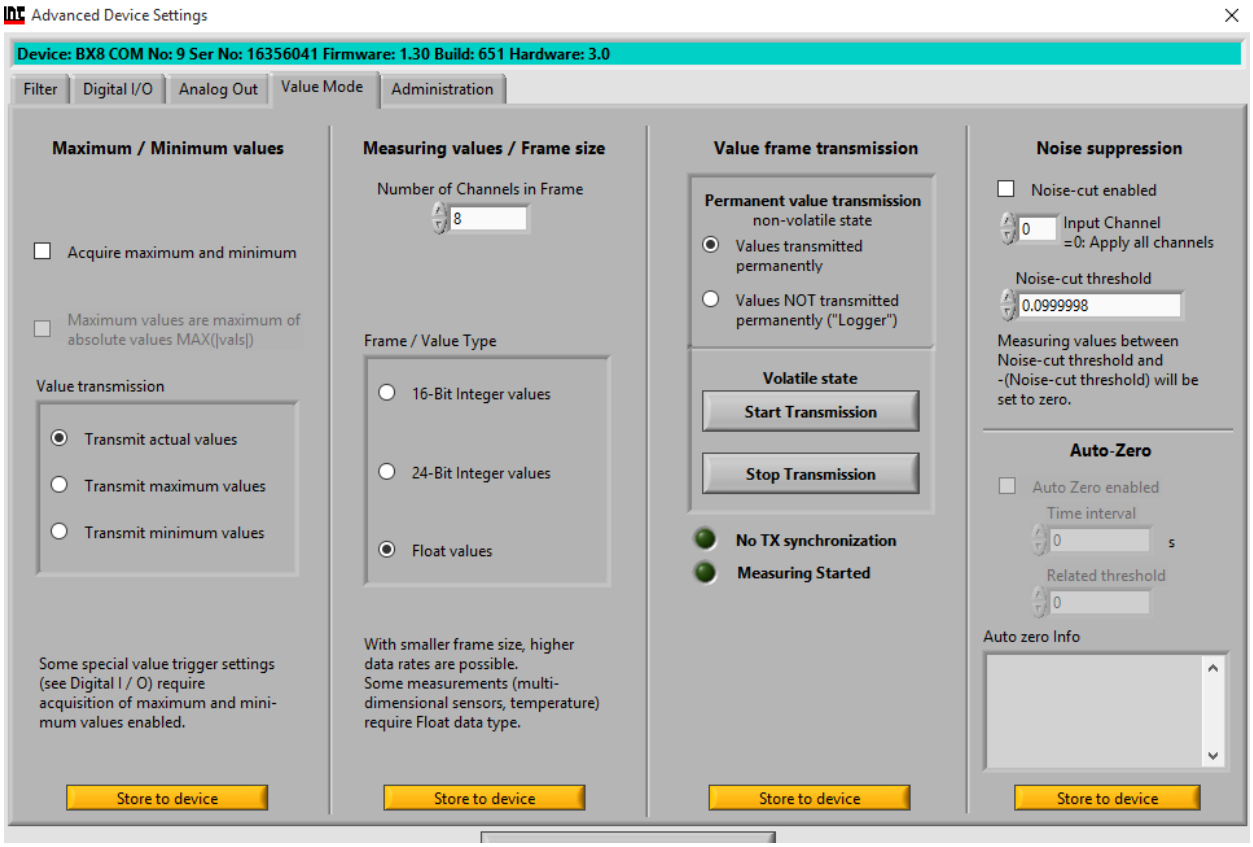


FIGURE 65 - VALUE MODE

4.5.1. Acquire maximum and minimum – Max/Min value determination enabled. This is a precondition for other max/min settings, also for some threshold and value-trigger modes.

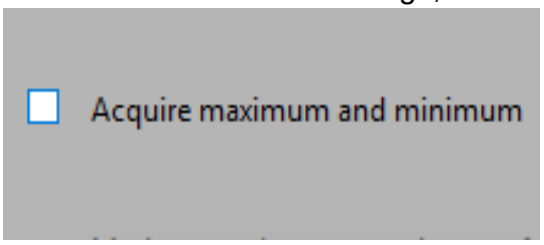


FIGURE 66 - ACQUIRE MAX AND MIN

4.5.2. Maximum values are maximum of absolute values MAX(|vals|) – Only active if “Acquire maximum and minimum” is checked. Replaces the maximum value register with that maxima

of the absolute values, so that both positive maximum and negative maximum values are determined.

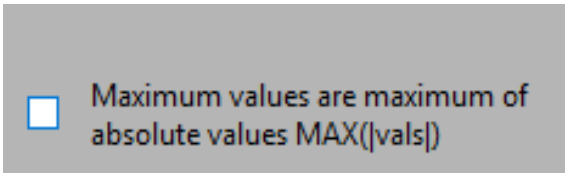


FIGURE 67 - MAX VALUES ARE MAXIMUM OF ABSOLUTE VALUES

4.5.3. Value transmission – Which values are in the value frame: All channels are either actual values, maximum values or minimum values.

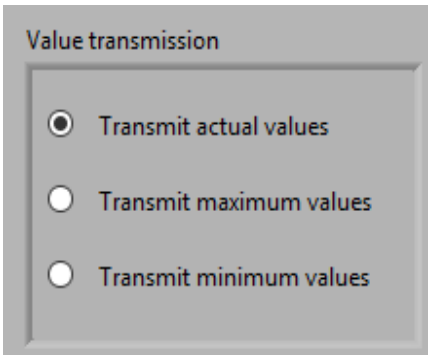


FIGURE 68 - VALUE TRANSMISSION

4.5.4. Number of Channels in Frame – Number of input channel values in the measuring data frame. With smaller numbers, higher data frequencies are possible.

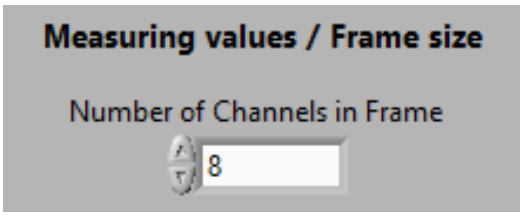


FIGURE 69 - MEASURING VALUES / FRAME SIZE

4.5.5. Frame / Value Type – Data type of measuring values in the value-frame that device transmits.

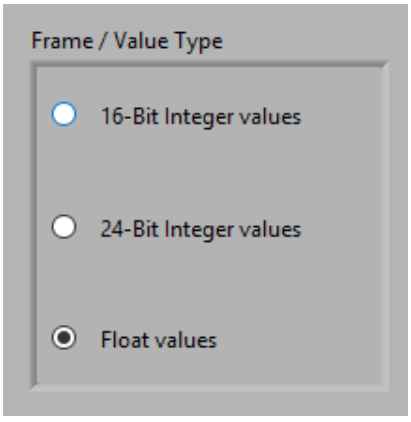


FIGURE 70 - FRAME / VALUE TYPE

4.5.6. Value frame transmission

A. Values transmitted permanently – After power-on, the device transmits measuring values continuously.

B. Values NOT transmitted permanently – After power-on, the device transmits measuring values on request.

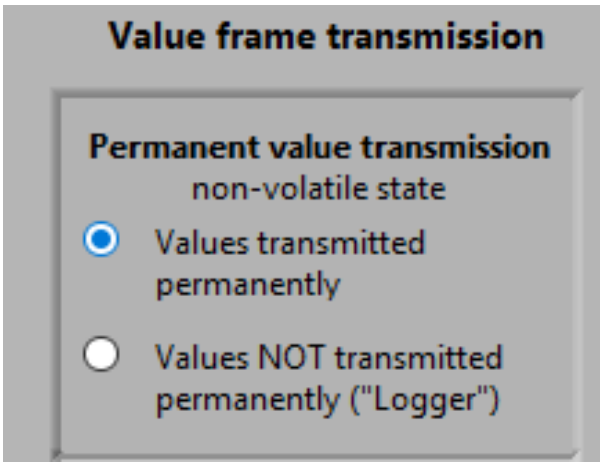


FIGURE 71 - VALUE FRAME TRANSMISSION

4.5.7. Volatile state

A. Start transmission of measuring values, if permanent value transmission is off. State not stored in non-volatile memory.

B. Stop Transmission of measuring values, if permanent value transmission is on. State not stored in non-volatile memory.

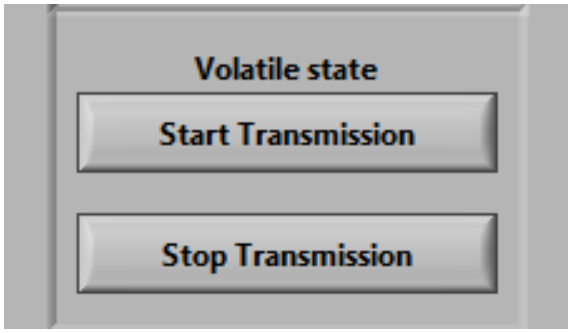


FIGURE 72 - VOLATILE STATE

4.5.8. Noise suppression

A. Noise-cut enabled – If measuring values are between Noise-cut threshold and (Noise-cut threshold), they will be set to 0.000000000, so that the noise around zero will be suppressed. Set checkbox to enable this feature.

B. Input Channel = 0: Apply all channels – Input channel to be used with Noise-cut. Set to 0: Use the same threshold for all inputs.

C. Noise-cut threshold – If measuring values are between Noise-cut threshold and (Noise-cut threshold), they will be set to 0.000000000, so that the noise around zero will be suppressed.

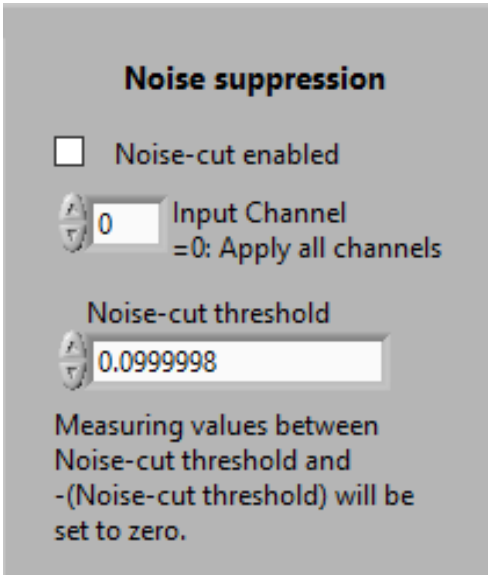


FIGURE 73 - NOISE SUPPRESSION

4.5.9. Auto-Zero enabled – Every (Time interval) seconds, an automatic set-zero routine will be performed.

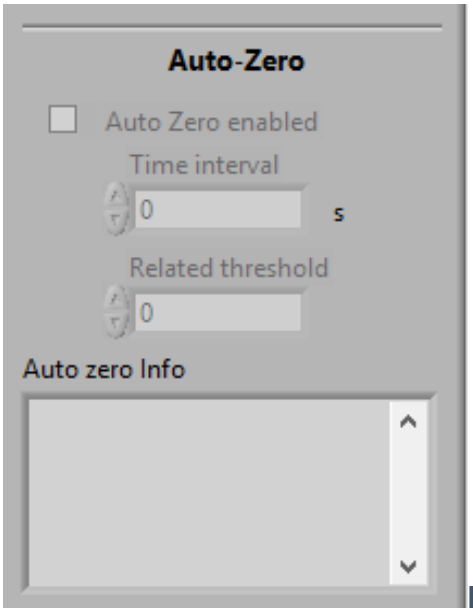


FIGURE 74 - AUTO-ZERO

4.6. Administration

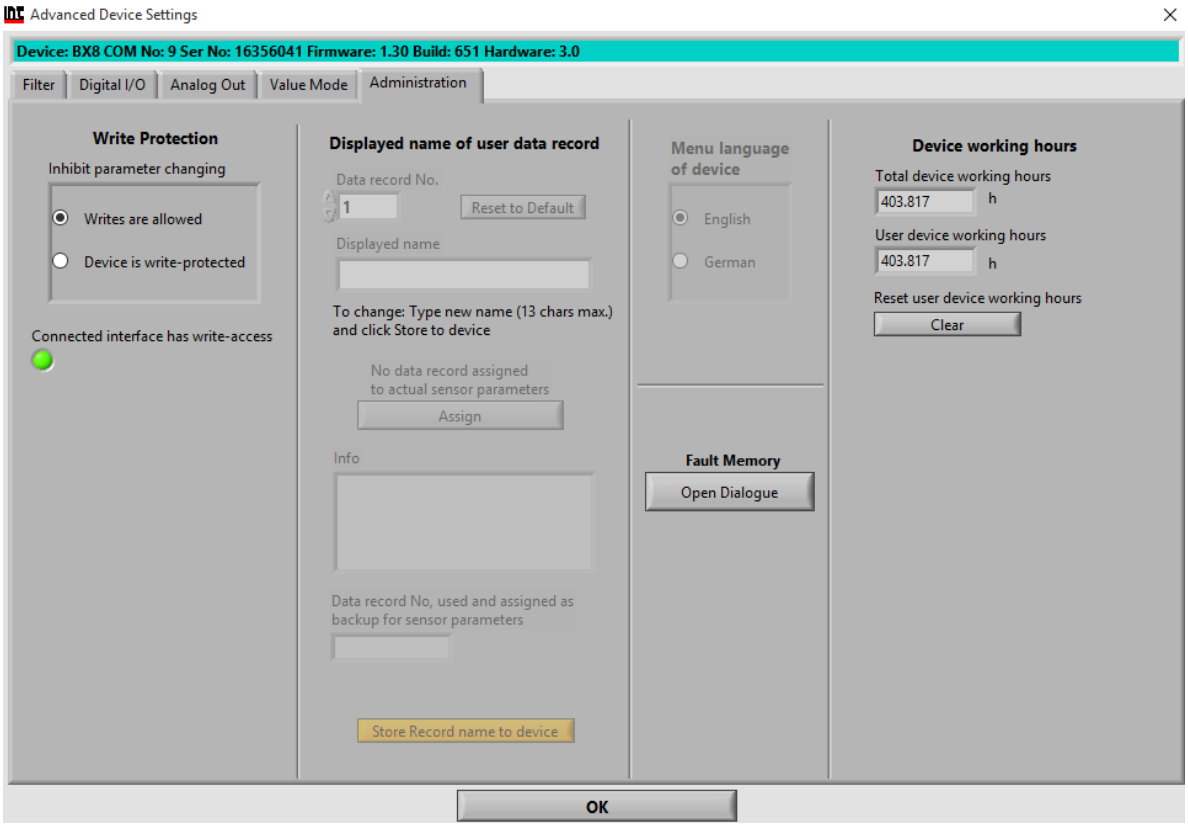


FIGURE 75 - ADMINISTRATION

4.6.1. Write Protection

A. Inhibit parameter changing – If the device is write-protected, the device parameters are secured from unintentional changing. To disable write-protection, a device-depended password must be entered.

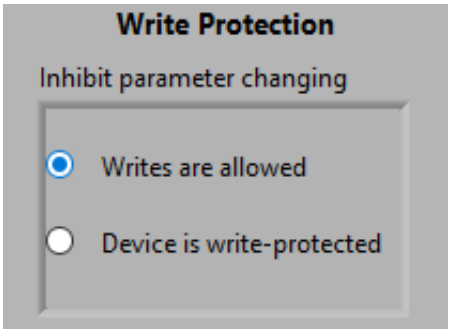


FIGURE 76 - WRITE PROTECTION

4.7. Displayed name of user data record

4.7.1. Data record No. – Six different parameter records can be saved and restored; in the main window with “Save Settings” and “Load Settings”. User-defined names for each data record

can be viewed and changed here. Parameter record number (1 to 6) can be set by this, to view and change its name.

A. Displayed name – Name of the parameter record.

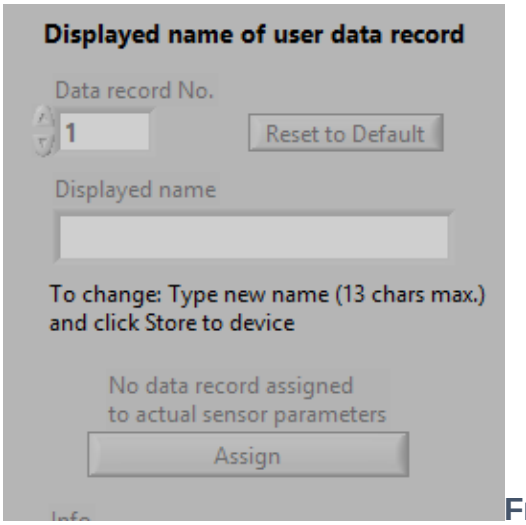


FIGURE 77 - DISPLAYED NAME OF USER DATA RECORD

4.7.2. Menu language of device

A. English
B. German

FIGURE 78 - MENU LANGUAGE OF DEVICE

4.7.3. Fault memory – Some devices are capable of storing faults that are related to external connections. E.g. broken sensor cable or value saturated.

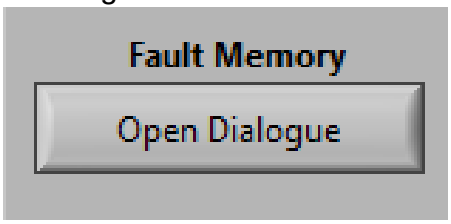


FIGURE 79 - FAULT MEMORY

4.7.4. Device working hours – Some devices count their working hours. This displays the absolute working hours, which can't be reset.

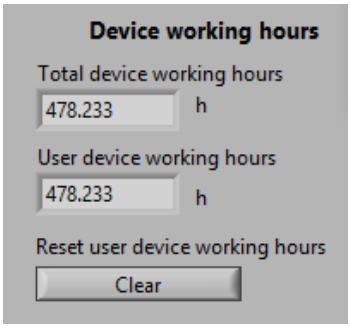


FIGURE 80 - DEVICE WORKING HOURS

Channel

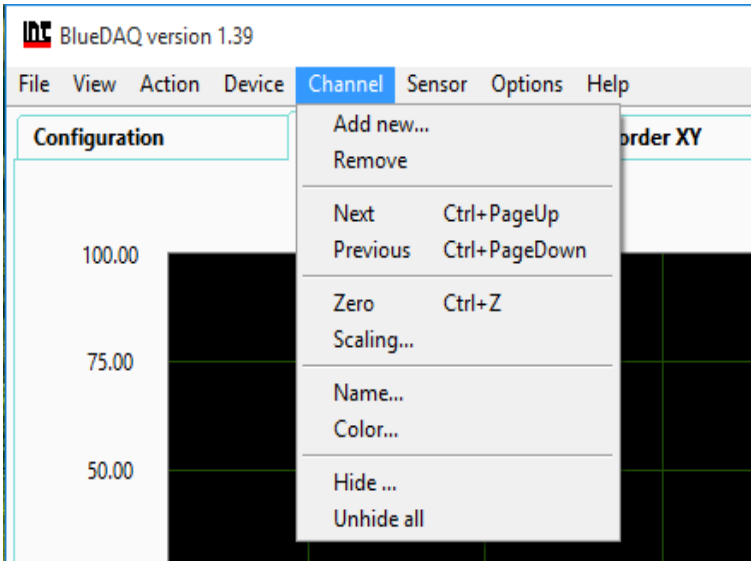


FIGURE 81 - CHANNEL

1. Add new

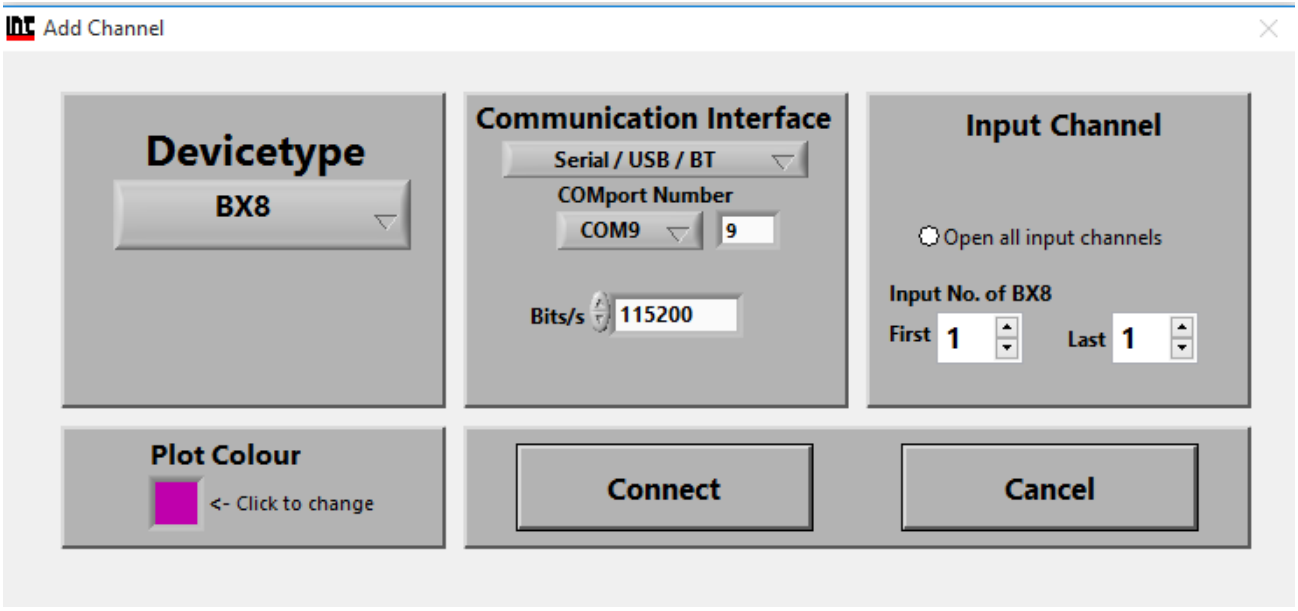


FIGURE 82 - ADD NEW

1.1. Devicetype

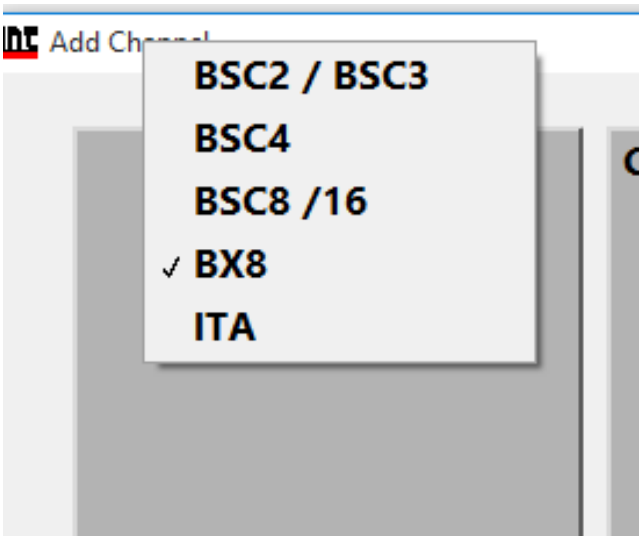


FIGURE 83 – DEVICETYPE

1.2. Communication Interface

1.2.1. Bits/s – Communication Bitrate. If you aren't sure which Bitrate is appropriate to your device, leave this at 115200.

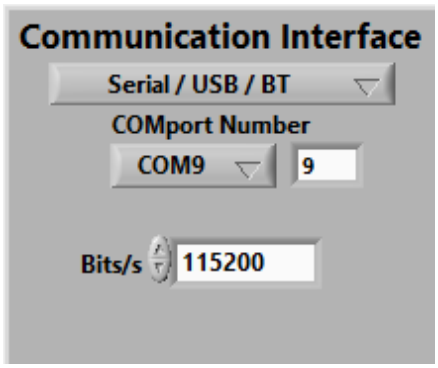


FIGURE 84 - COMMUNICATION INTERFACE

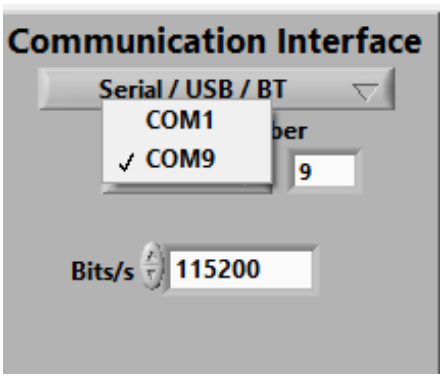


FIGURE 85 - COMMUNICATION INTERFACE COM

1.3. Input Channel

1.3.1. Open all input channels will open all 8 inputs.

1.3.2. Input No. of BX8 – The amplifier has several inputs. Select the desired input(s) here. If opening several inputs, enter lowest channel-No. to open here.

i. First
ii. Last

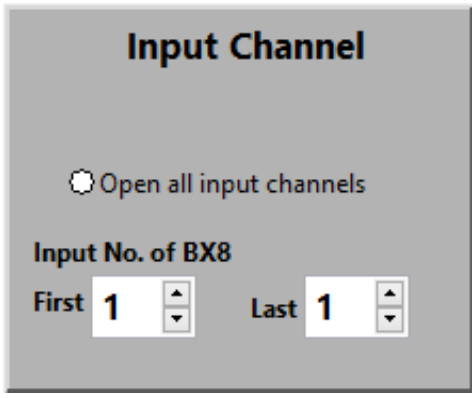


FIGURE 86 - INPUT CHANNEL

1.4. Connect and Cancel

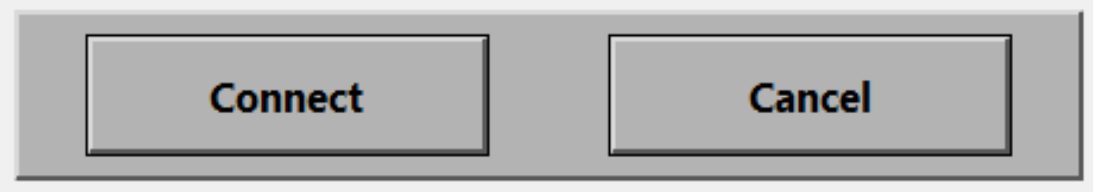


FIGURE 87 - CONNECT AND CANCEL

2. Channel Scaling

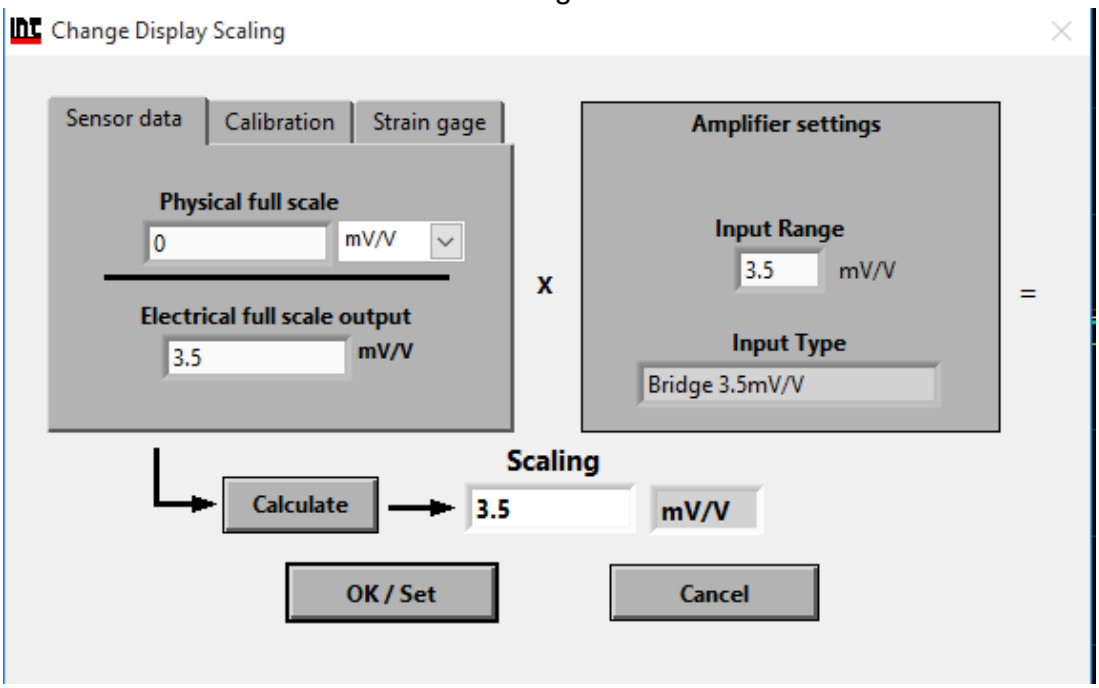


FIGURE 88 - CHANNEL SCALING

Sensor

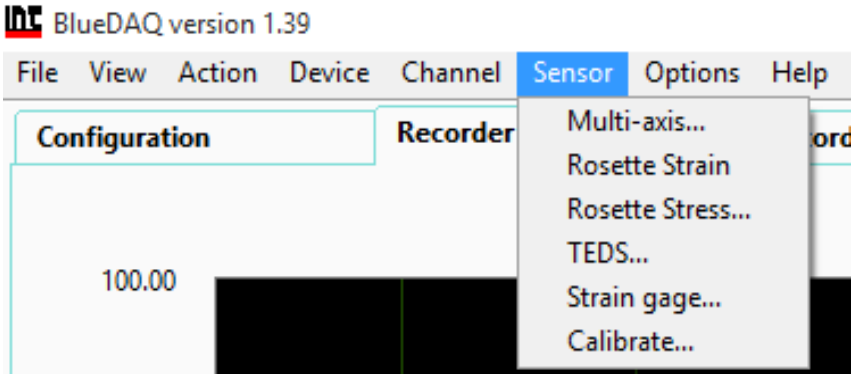


FIGURE 89 – SENSOR MENU

1. Multi-axis – Refer to **step 5.**

2. Rosette Strain – Arrangement of two or more strain gauges.

3. Rosette Stress

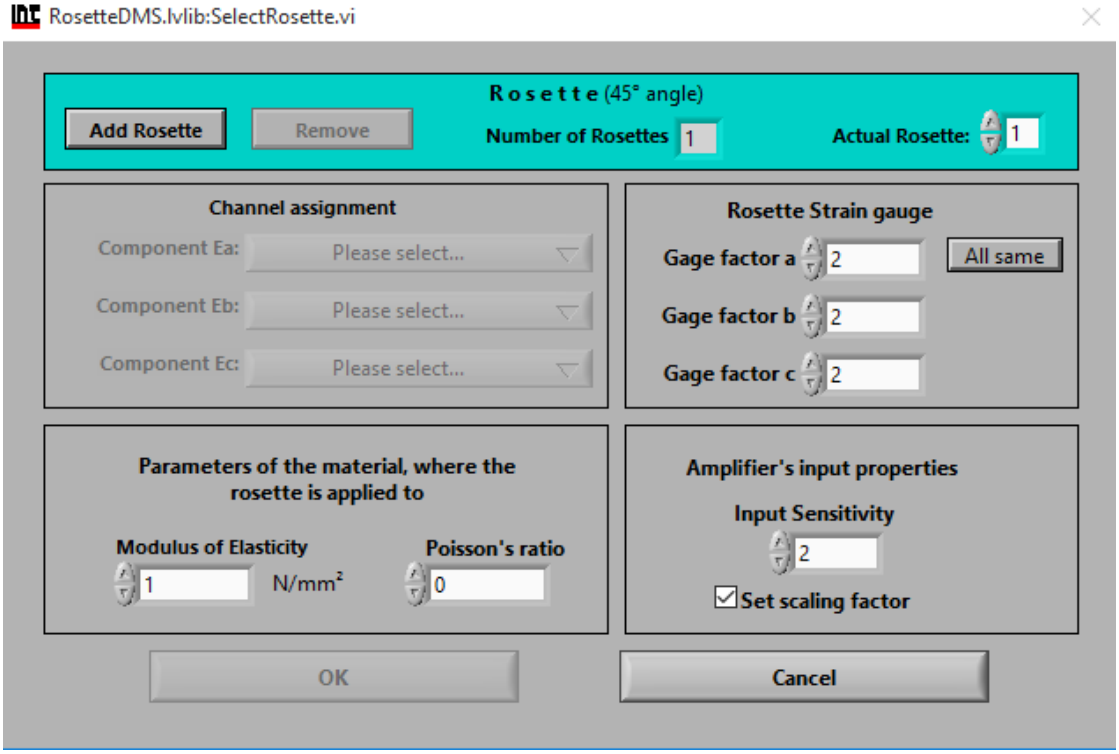


FIGURE 90 - ROSETTE STRESS

4. Add Rosette / Remove

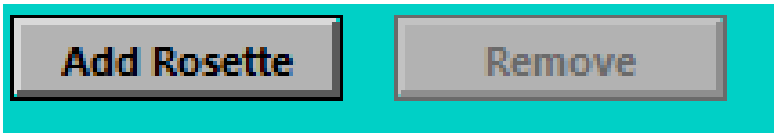


FIGURE 91 - ADD ROSETTE

5. Number of Rosettes – Number of included rosette strain gauges which are configured already.

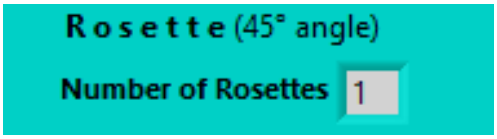


FIGURE 92 - NUMBER OF ROSETTES

6. Actual Rosette – If you have configured more than one rosette strain gauge, here you can switch between the different rosette stain gauge settings.

FIGURE 93 - ACTUAL ROSETTE

7. Component Ea: - The Rosette-Strain gauge consists of three single strain gauges which are arranged at an angle of 45° to each other. Choose here for the physical channel of your measuring amplifier where the single strain gauge Epsilon A is connected to. The resulting angle value of Phi refers to the longitudinal axis of this single strain gauge.

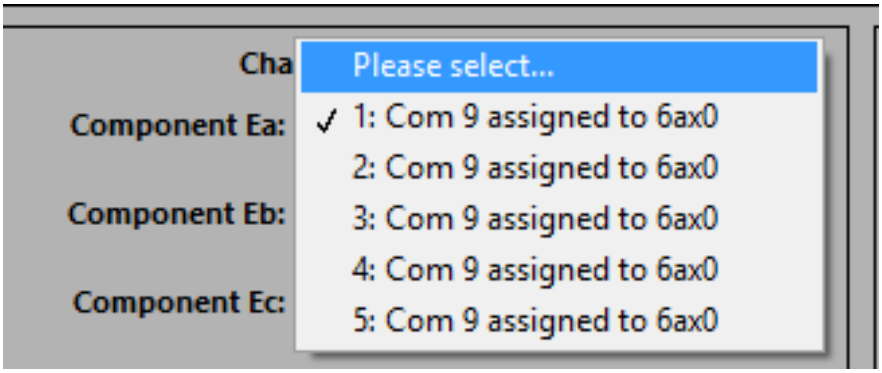


FIGURE 94 - COMPONENT EA

8. Parameters of the material, where the rosette is applied to

8.1. Modulus of Elasticity – Enter the elastic modulus of the material, whose stress shall be determined in Newtown per square millimeters. The elastic modulus of an object is defined as the slope of its stress-strain curve in the elastic deformation region of the material to be measured. Since this parameter is very significant for the stress calculation, it should be entered as exact as possible. Please multiply the values in lb/in^2 with 0.0068971125763 to get the modulus in N/mm^2.

8.2. Poisson's ratio – Enter the Poisson's ratio of the material whose stress shall be determined. The Poisson's ratio is the ratio when a sample object is stretched of the contraction or transverse strain (perpendicular to the applied load), to the extension or axial strain. Since this parameter is a little less significant for the stress calculation, an approximate value may be entered.

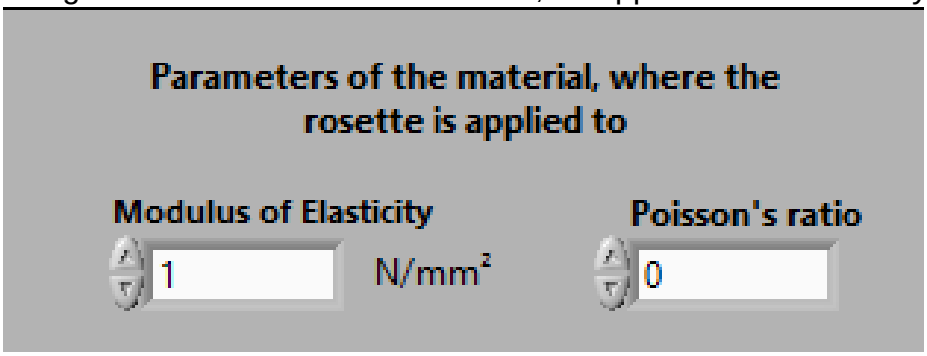


FIGURE 95 - PARAMETERS OF THE MATERIAL

8.3. Gage factor – Enter the gage factor for the single strain gauge. The gauge factor is the ratio of relative change in an electrical resistance to the mechanical strain epsilon. If all three gauge factors are equal, enter the value and then press "All Same".

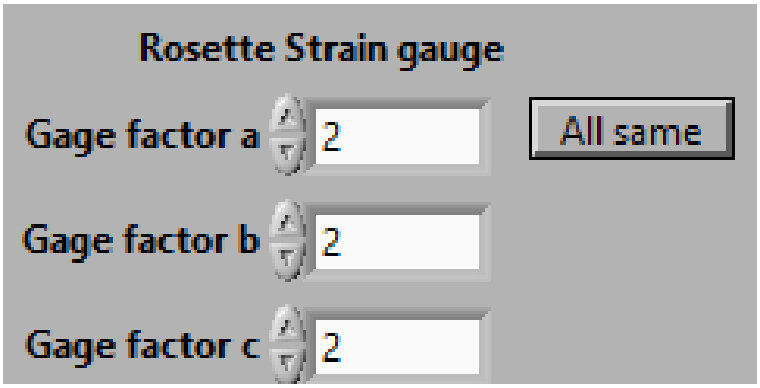


FIGURE 96 - ROSETTE STRAIN GAUGE

8.4. Amplifier's input properties

8.4.1. Input Sensitivity – Change this value if it doesn't match the input sensitivity of the measuring amplifier where the strain ages are connected to. Normally the value shown is the correct value, some GSV-2 or GSV-4 measuring amplifiers do communicate the correct value to the program. Together with the gauge factor, this value will be used to calculate the correct scaling factor automatically after the OK button is pressed. NOTE: The strain gauges must be wired in a quarter bridge configuration in order to calculate the scaling factor correctly.

8.4.2. Set Scaling factor – Uncheck this checkbox if you are sure that the scaling factors of the channels where the three strain gauges are connected to are already correct. If checked, the new scaling factor will be calculated automatically according to the gauge factors and the input sensitivity settings. NOTE: the strain gauges must be wired in a quarter bridge configuration in order to calculate the new scaling.

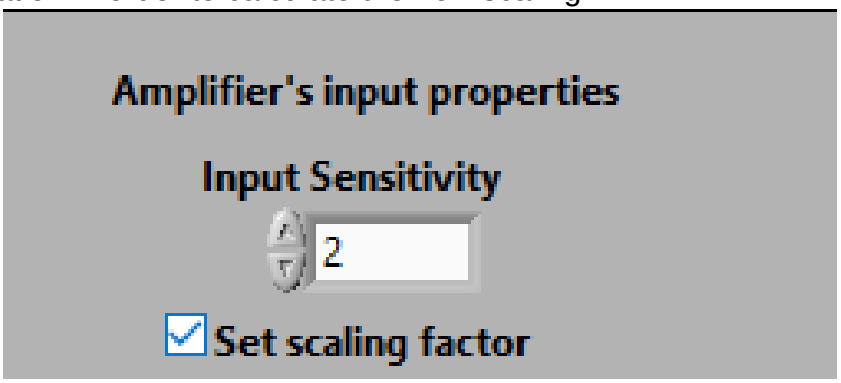


FIGURE 97 - AMPLIFIER'S INPUT PROPERTIES

9. TEDS – Transducer Electronic Data Sheet

10. Strain gage

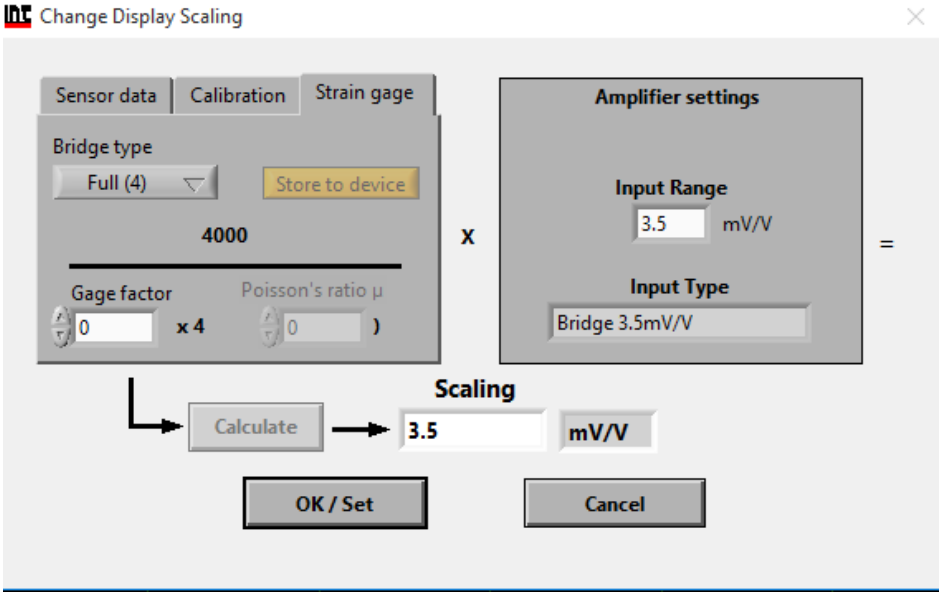


FIGURE 98 - STRAIN GAGE

11. Calibrate

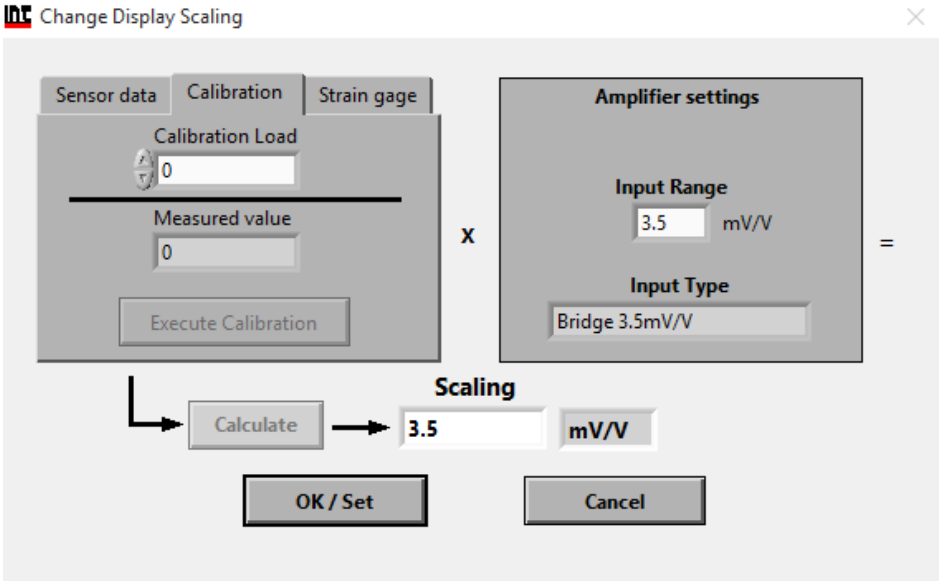


FIGURE 99 - CALIBRATE

Options

1. Hardware

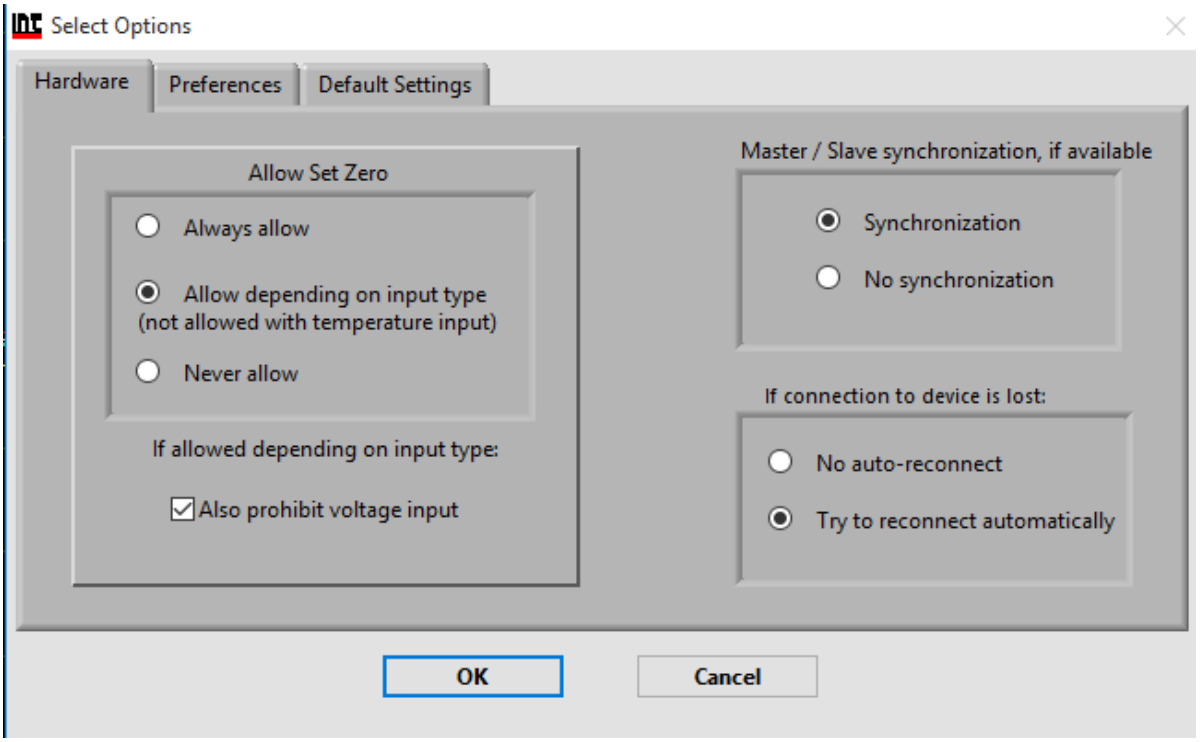


FIGURE 100 - HARDWARE

2. Preferences

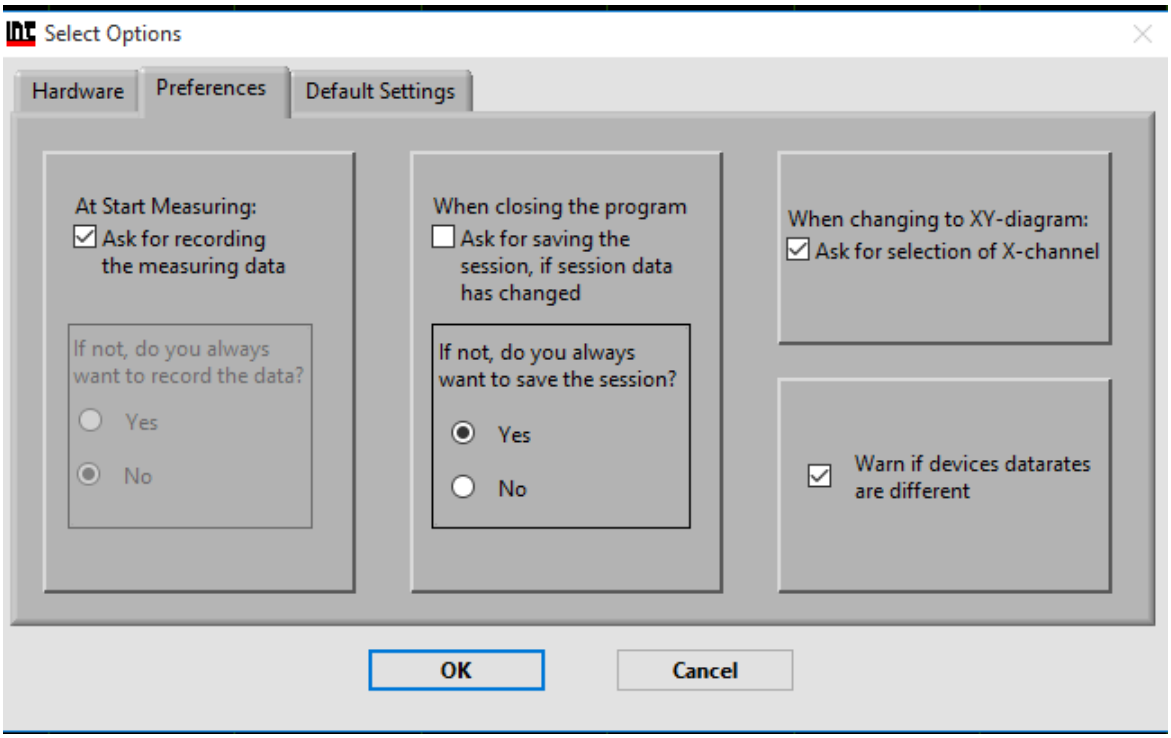


FIGURE 101 - PREFERENCES

3. Default Settings

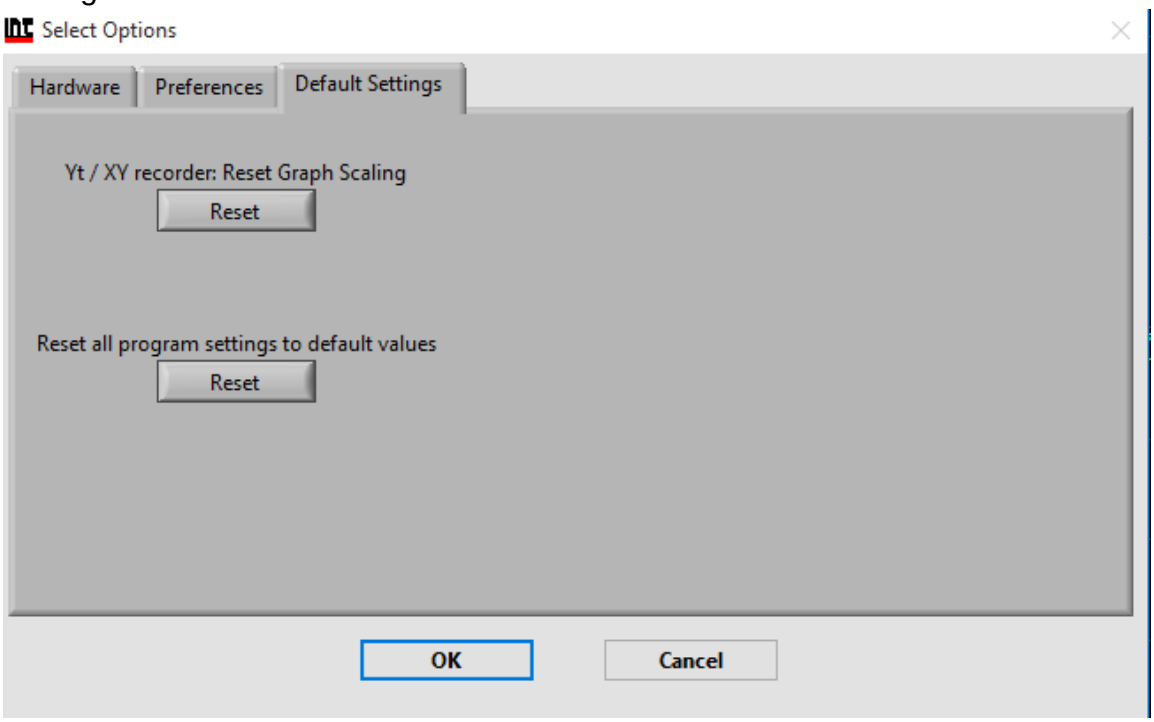


FIGURE 102 - DEFAULT SETTINGS

Help

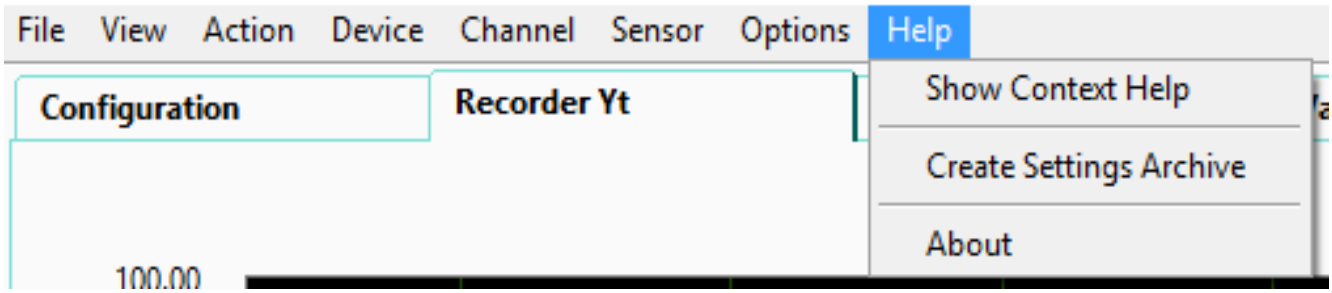


FIGURE 103 - HELP

1. Show Context Help

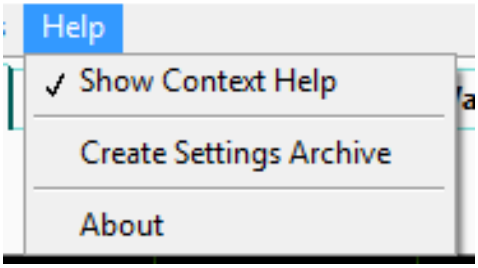


FIGURE 104 - SHOW CONTEXT HELP

2. A box will appear on the corner with a definition of each function.

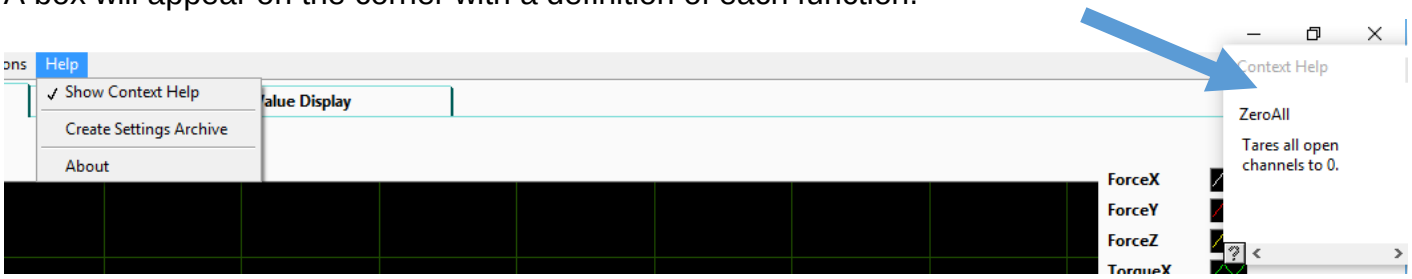


FIGURE 105 - CONTEXT HELP POPUP

3. Create Settings Archive

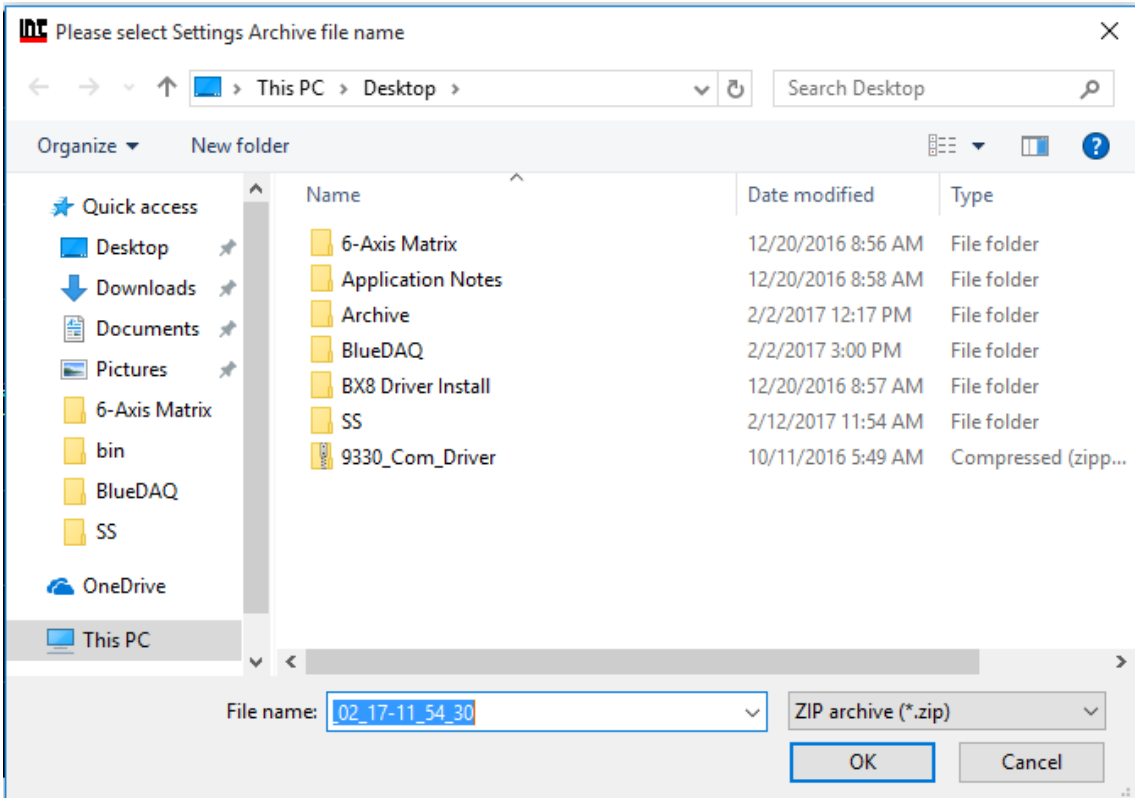


FIGURE 106 - CREATE SETTINGS ARCHIVE

4. About lets you know the BlueDAQ version number.

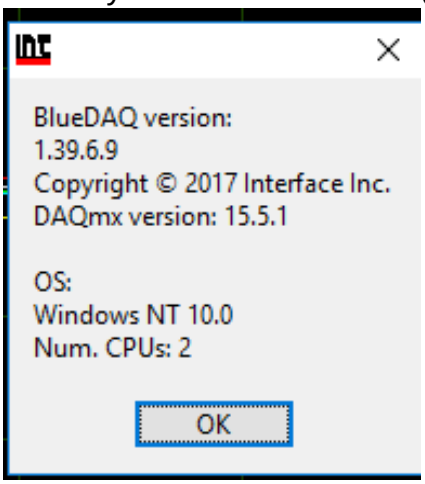


FIGURE 107 – ABOUT

Warranty

All Telemetry products from Interface Inc., ('Interface') are warranted against defective material and workmanship for a period of (1) one year from the date of dispatch. If the 'Interface' product you purchase appears to have a defect in material or workmanship or fails during normal use within the period, please contact your Distributor, who will assist you in resolving the problem. If it is necessary to return the product to 'Interface' please include a note stating name, company, address, phone number and a detailed description of the problem. Also, please indicate if it is a warranty repair. The sender is responsible for shipping charges, freight insurance and proper packaging to prevent breakage in transit. 'Interface' warranty does not apply to defects resulting from action of the buyer such as mishandling, improper interfacing, operation outside of design limits, improper repair or unauthorized modification. No other warranties are expressed or implied. 'Interface' specifically disclaims any implied warranties of merchantability or fitness for a specific purpose. The remedies outlined above are the buyer's only remedies. 'Interface' will not be liable for direct, indirect, special, incidental or consequential damages whether based on the contract, tort or other legal theory. Any corrective maintenance required after the warranty period should be performed by 'Interface' approved personnel only.

Revision History		
Author	**Revision**	**Release Date**
WU	C	01/10/2020