



Data Translation Driver for DASyLab

Revision 5.2.0.0

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1. System Requirements

The Data Translation DASyLab driver supports multiple DT Open Layers DAQ devices (USB and PCI) under DASyLab 9 or higher for Windows XP (32-bit), Windows Vista (32-bit and 64-bit), Windows 7 (32-bit and 64-bit) and Windows 8 (32-bit and 64-bit).

You must install the device driver (DT Open Layers) for your device before connecting the module / board to the computer. Run the installation program on the *Data Acquisition OMNI CD* to install the device driver. You can also download the driver from our Website.

If you want to run the DASyLab driver automatically (see Chapter 2), the Microsoft .NET Framework 4 needs to be installed and you also need full administrator permissions. DASyLab also must be installed in the standard DASyLab folders. DASyLab must be started at least once before, so that the **dasyLab.ini** file is present.

2. Installation Instructions

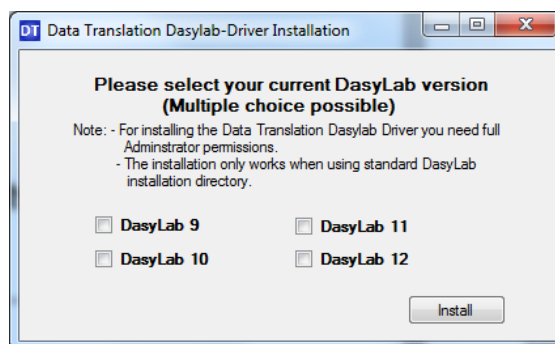
The Data Translation Driver for DASyLab can be installed automatically or manually. The automatic installation is only works for DASyLab (not for ServiceLab).

2.1 Automatic Installation

To install the DASyLab driver automatically, please extract all files in the archive

DataTranslation-DASyLab-Driver-ux1.zip

into the same directory on your hard disk drive. Then run **DT_Driver_Installation.exe** and the following message appears:



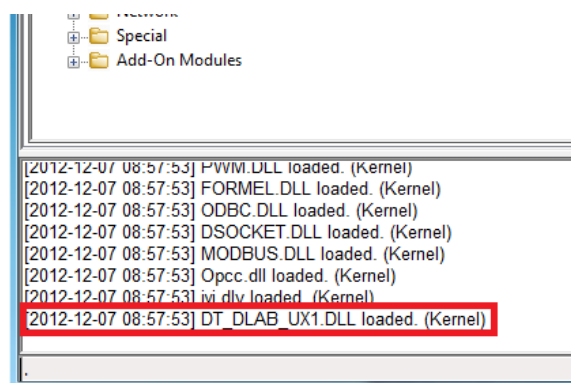
Select the DASyLab version you are using and click on **Install**.

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If the installation was successful, you will see the following window:



When you start DASYLab, the driver is automatically load at the startup



If the automatic installation was not successful, you will see the following window:



In this case we recommend installing the DASYLab driver via manual installation.

2.2 Manual Installation

- 1.) Copy the DASYLab driver file **DT_DLab_ux1.dll** into the directory where the DASYLab installation is located. Typically this is C:\Program Files\DASYLab 12.0.
- 2.) Open the DASYLab configuration file **dasylab.ini** which is located in the same directory if you use DASYLab 9.0. If you are using DASYLab 10 or higher the dasylab.ini is located in a different folder, depending on your system settings (e.g. C:\Users\Public\Public Documents\DasyLab\12.0.0\ENG).

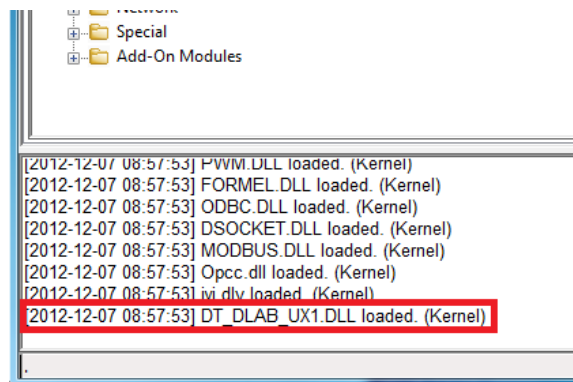
- 3.) Change the entry

DLL1=DLAB_UX1.DLL

to

DLL1=DT_DLAB_UX1.DLL

- 4.) Save the settings save the settings and start DASYLab
- 5.) DASYLab automatically loads the driver during startup



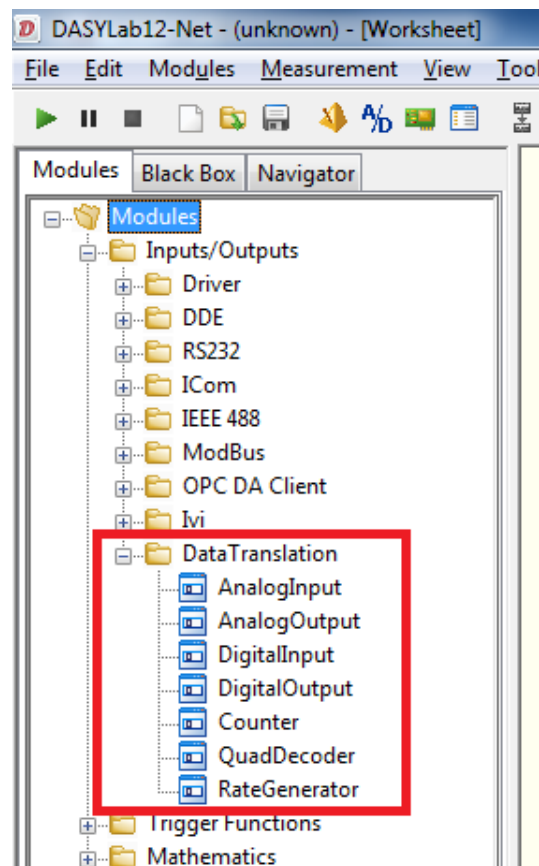
3. Data Translation Modules in DASyLab

For each subsystem of a DT DAQ device you find a single module in the tree view

Modules → Inputs/Outputs → DataTranslation

which can be dragged & dropped into the worksheet:

- 1.) AnalogInput
- 2.) AnalogOutput
- 3.) DigitalInput
- 4.) DigitalOutput
- 5.) Counter
- 6.) QuadDecoder
- 7.) RateGenerator





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3.1 Global Variables

The AnalogInput module supports global variables for the Sampling Rate, Buffer Size, Gain and Channel Name. The Counter/Timer module supports a global variable for the Count Duration.

3.2 How to use the analog output of DT9837A / C and DT 9847-Series

The minimum sampling rate of the analog output channel in streaming mode of the DT9837A and DT9837C is 10 kHz. Therefore please ensure that a value ≥ 10 kHz is set. You can adjust this in the following menus:

Measurement → Time Bases → All Settings

Measurement → Measurement Setup → Driver

For the DT 9847 Series you need to use a value ≥ 30 kHz.

3.3 How to use two or more DT9837A / B / C, DT9838 or DT9847-Series

If you want to synchronize two (or more) DT9837A / B / C, DT9838 or DT9847 devices please ensure that the slave devices are selected in the first AnalogInput module and that the master device is selected in the last AnalogInput module you place on the worksheet.

This is necessary because the DAQ device which is selected in the first AnalogInput module is started at first. Slave devices must be started before the master device.

3.4 How to use the TacholInput of DT9837, DT9837A / B and DT9838

The TacholInput of the DT9837A and DT9837B provides two measure modes: Select **Zeros** if you want to read a value of 0 between measurements, or select **Previous Measurement** if you want to read the previous measurement value if the new measurement value is not yet complete.

For the DT9837 and the DT9838 the measure mode for the TacholInput is always Previous Measurement

3.5 How to use one or more Counter, Quad. Decoder and Rate Generator subsystems

The Counter, QuadDecoder and the RateGenerator modules always use the first available subsystem element. The entry next to **Port Number** in these modules shows the number of the subsystem used. You can't configure/change this!



3.6 How to stream Digital Input and / or Counter channels

The AnalogInput module supports the option to stream the Digital Input (DIN) channels and / or Counter channels (currently limited to one Counter channel) along with the analog input channels. These features are not supported by all DT DAQ devices. Please check the specifications for your hardware.

If you select the DIN subsystem to be streamed, please note that the DIN channel automatically added and will be the last channel in the channel selection.

If you select the Counter subsystem to be streamed, please note that the Counter needs two channels: One channel for the lower 16 bit (Low Byte) and one channel for the higher 16 bit (High Byte). These two channels will be automatically added and will be the last channel in the channel selection.

If you use the DIN and the Counter subsystem, the DIN channel is always the last but two, the Counter Low byte the next to last and the Counter High byte the last channel in the channel selection.

Here are some examples:

Three analog inputs:

AI1	AI2	AI3
Channel 0	Channel 1	Channel 2

Three analog inputs and DIN:

AI1	AI2	AI3	DIN
Channel 0	Channel 1	Channel 2	Channel 3

Three analog inputs and one Counter:

AI1	AI2	AI3	CT Low	CT High
Channel 0	Channel 1	Channel 2	Channel 3	Channel 4

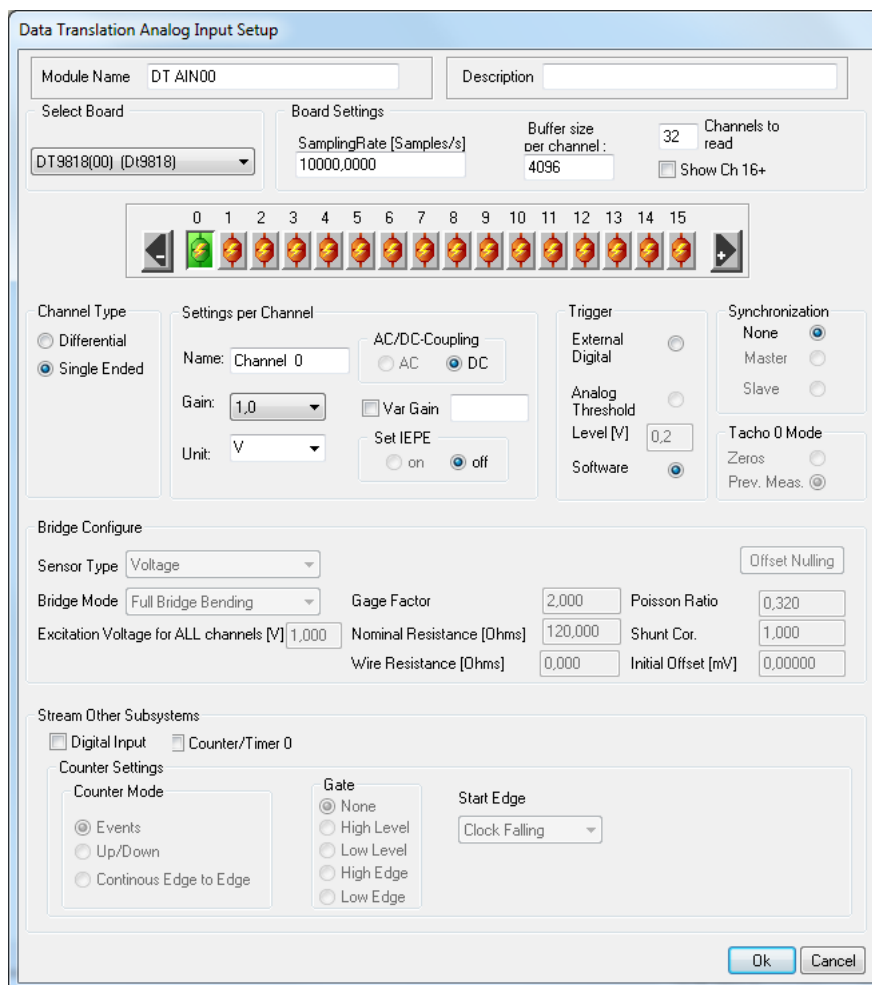
Three analog inputs, DIN and one Counter:

AI1	AI2	AI3	DIN	CT Low	CT High
Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5

3.7 How to use DT DAQ devices with more than 16 analog input channels

DASYLab does not support any modules with more than 16 input or output channels. So if you want to acquire e.g. all 32 analog input channels of the USB DAQ module DT9818-32 or PCI DAQ board DT3034 you need to use two AnalogInput modules. Please ensure the following sequence:

- 1.) Drag & Drop one AnalogInput module on the worksheet.
- 2.) Select the board.
- 3.) Configure the channel and hardware settings.
- 4.) In the text field next to **Channels to read** enter the number of analog input channels you want to acquire.
- 5.) Add the 16 channels by clicking on the  button
- 6.) Click on **Ok** to close the dialog

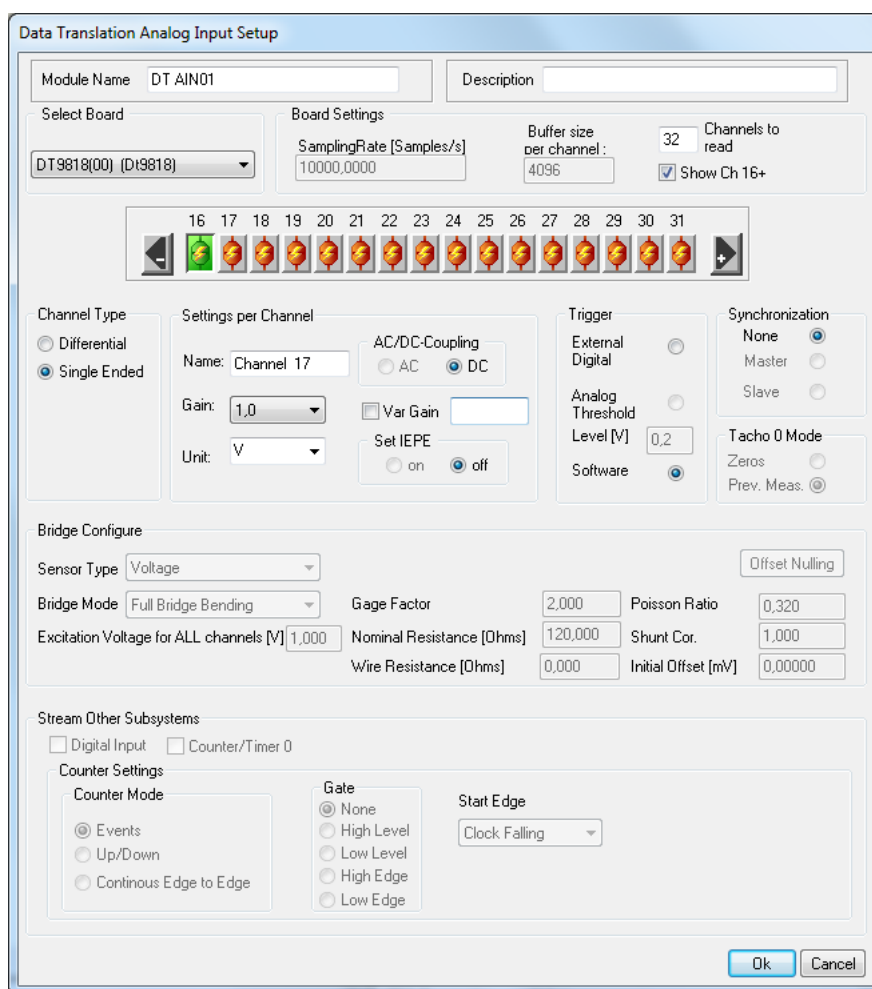


AnalogInput module for the first 16 channels

- 7.) Drag & Drop a second AnalogInput module on the worksheet
- 8.) At first check the box "**Show Ch 16+**".

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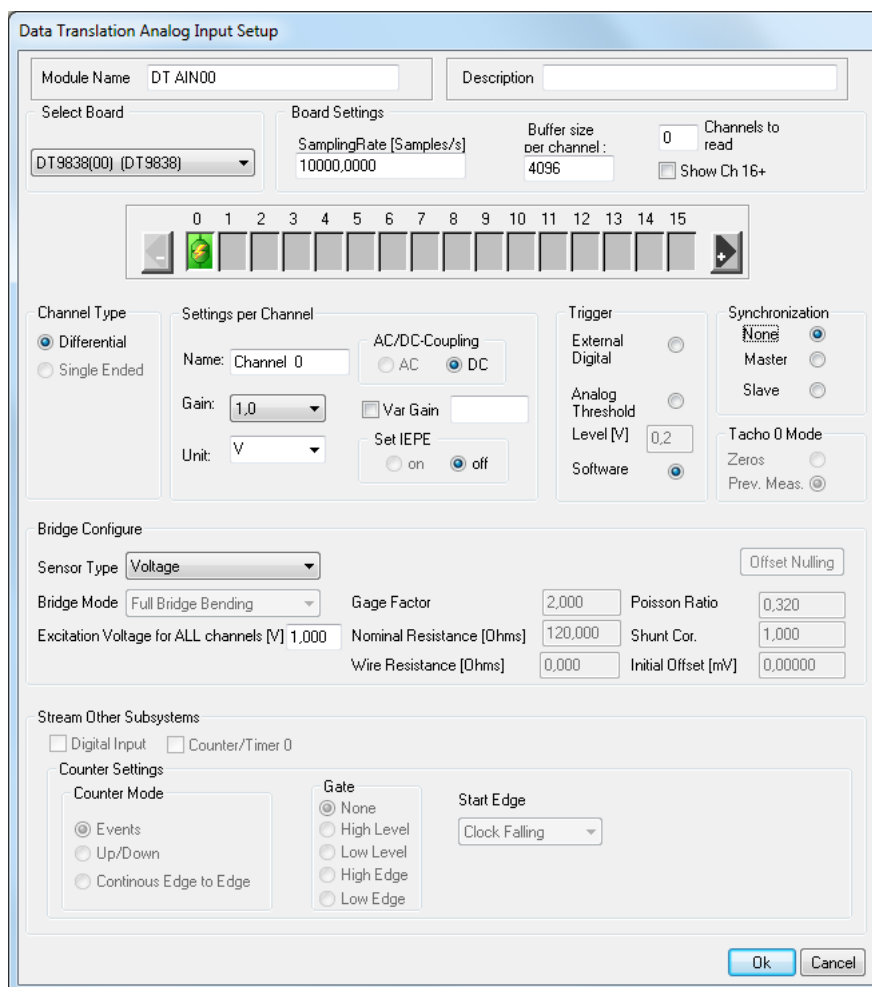
- 9.) Then enter the buffer size per channel and the number of channels to read.
Caution: Those two values have to be the same as defined in the first AnalogInput
- 10.) Now select the very same board as in the first AnalogInput module. If you do step 10 before step 9 you will get the error message **Subsystem already in use**. If you get this error message you must delete the second analog input module and drag and drop a new one on the worksheet.
- 11.) Add the 16+ channels by clicking on the  button
- 12.) Any settings like Single Ended or Differential you perform now are not used. This module is just needed to show the signals on the analog input channels higher 16.
- 13.) Click on **Ok** to close the dialog



AnalogInput module for the 16+ channels

3.8 How to use DT DAQ devices that support DMS/Bridge input channels (DT9838-Series)

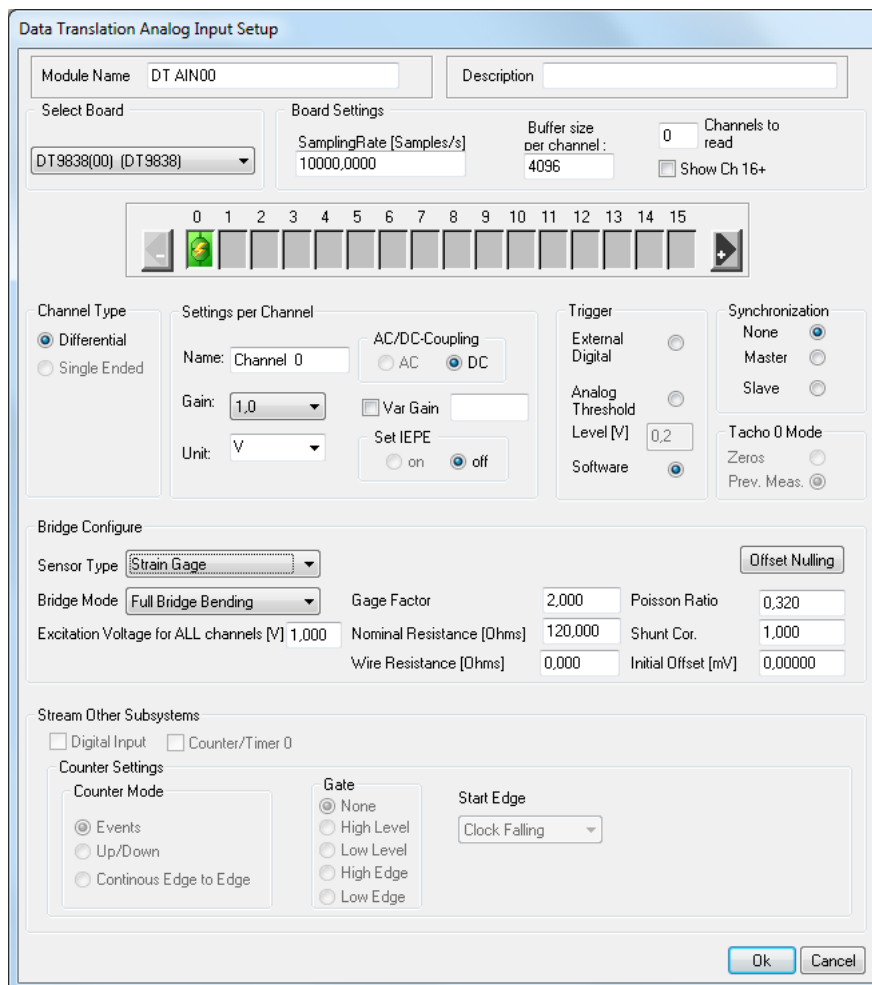
If you configure the Sensor Type as **Voltage** ($\pm 250\text{mV}$ input range) for an analog input, you can only configure the **Excitation Voltage** for all channels in volt. All other settings are greyed out and not accessible.



AnalogInput module for modules that support DMS/Bridge input channels in Voltage mode

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If you configure the Sensor Type as **Strain Gage** for an analog input you can configure the following parameters:



AnalogInput module for DAQ devices that support DMS/Bridge input channels in Strain Gage mode

Bridge Mode

Select one of the following bridge configurations; refer to the user's manual for your device for more information about each of these configuration types:

- Quarter Bridge
- Quarter Bridge Temp Comp
- Full Bridge Axial Poisson
- Full Bridge Bending
- Full Bridge Bending Poisson
- Half Bridge Bending
- Half Bridge Poisson

Excitation Voltage for ALL channels [V]

Specify the value of the excitation voltage from 0V to 10V that will be applied to all analog input channels on the device.

Gage Factor

For the selected analog input channel, enter the gage factor that is specified by the manufacturer of the strain gage.

Nominal Resistance [Ohms]

For the selected analog input channel, enter the nominal gage resistance, in ohms, that is specified by the manufacturer of the strain gage.

Wire Resistance [Ohms]

For the selected analog input channel, specify the lead wire resistance, in ohms. Note that if remote sense lines are used, then this value is set to 0 automatically.

Poisson Ratio

Depending on the bridge type, specify the Poisson ratio for each analog input channel. The following Poisson ratios can be used for various materials:

- rubber:	~0,32
- gold	0,42
- saturated clay	0,40 – 0,50
- magnesium	0,35
- titanium	0,34
- copper	0,33
- aluminum-alloy	0,33
- clay	0,30 – 0,45
- stainless steel	0,30 – 0,31
- steel	0,27 – 0,30
- cast iron	0,21 – 0,26
- sand	0,20 – 0,45
- concrete	0,20
- glass	0,18 – 0,30
- foam	0,10 – 0,40
- cork	~0,00

Shunt Correction:

Specify the shunt correction value that will be applied to the analog input channel. The default value is 1 (no correction).

Initial Offset [mV]

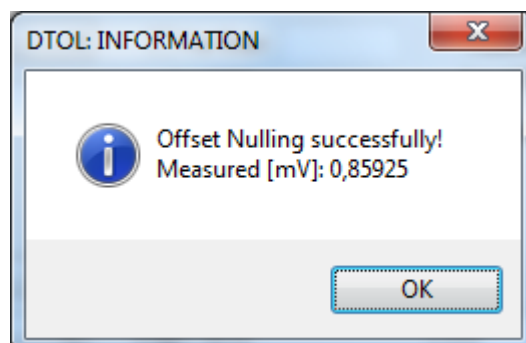
Specify the initial, unstrained voltage output of the bridge.

Offset Nulling

A balanced bridge produces zero volts under ideal conditions with zero strain applied. In practice, however, the output of a bridge in an unstrained condition is offset from zero slightly due to imperfect matching of bridge resistances. You can adjust the offset of the channel by performing offset nulling on the channel.

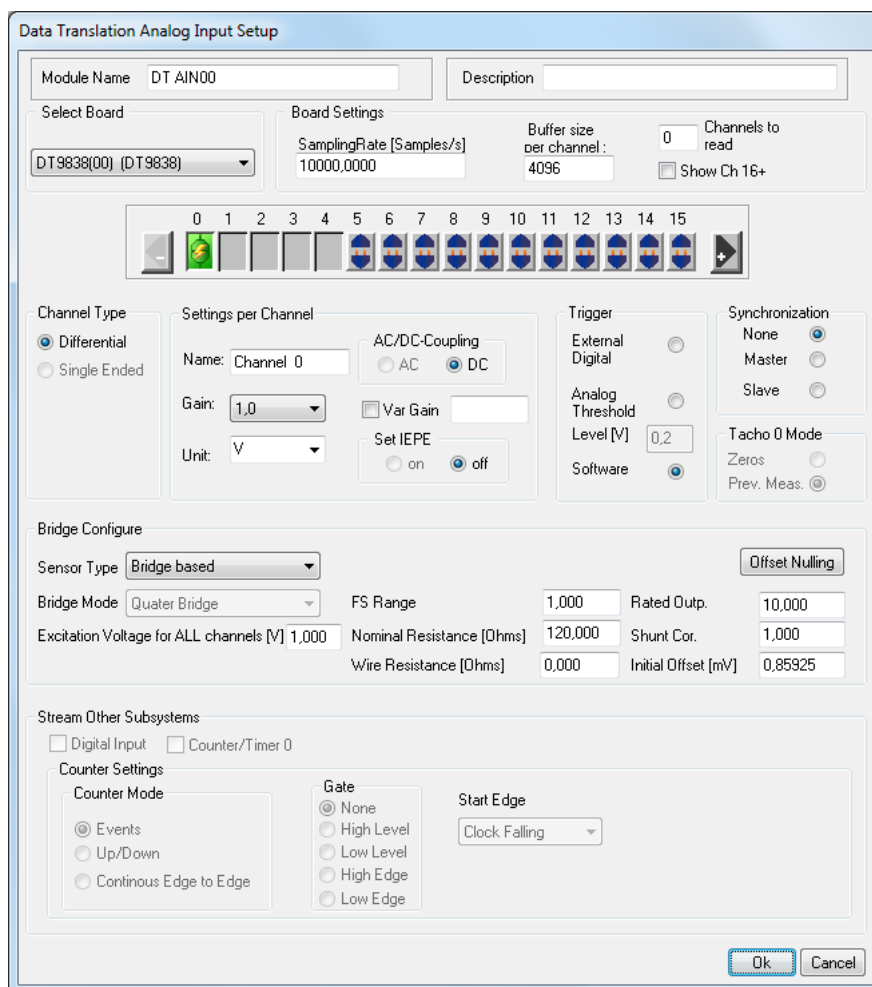
Internally, this value is subtracted from all subsequent measurements before the voltage is converted to the selected engineering units. The Offset Nulling will be executed at the sample rate you selected in the AnalogInput module.

Note that you wish, you can change this value manually in the edit field **Initial Offset**.



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If you configure the Sensor Type as **Bridge based** for an analog input you can configure the following parameters:



AnalogInput module for DAQ devices that support DMS/Bridge input channels in Bridge based mode

Excitation Voltage for ALL channels [V]

Specify the value of the excitation voltage from 0V to 10V that will be applied to all analog input channels on the device.

FS Range

Specify the full-scale range of the transducer in his native engineering units.

Nominal Resistance [Ohms]

For the selected analog input channel, enter the nominal gage resistance, in ohms, that is specified by the manufacturer of the sensor.

Wire Resistance [Ohms]

For the selected analog input channel, specify the lead wire resistance, in ohms. Note that if remote sense lines are used, then this value is set to 0 automatically.

Rated Output

Specify the rated output of the transducer in terms of mV/V excitation.

Shunt Correction:

Specify the shunt correction value that will be applied to the analog input channel. The default value is 1 (no correction).

Initial Offset [mV]

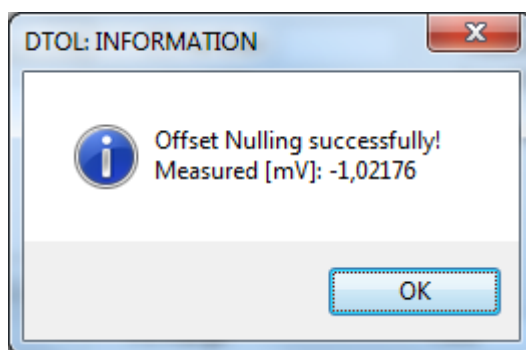
Specify the initial, unstrained voltage output of the bridge.

Offset Nulling

A balanced bridge produces zero volts under ideal conditions with zero strain applied. In practice, however, the output of a bridge in an unstrained condition is offset from zero slightly due to imperfect matching of bridge resistances. You can adjust the offset of the channel by performing offset nulling on the channel.

Internally, this value is subtracted from all subsequent measurements before the voltage is converted to the selected engineering units. The Offset Nulling will be executed at the sample rate you selected in the AnalogInput module.

Note that you wish, you can change this value manually in the edit field **Initial Offset**.





4. Installation under ServiceLab

For ServiceLab, there is no automatic installation available and the files must be copied/edited manually.

- 1.) Copy the ServiceLab (DASYLab) driver file **DT_Dlab_ux1.dll** into the directory where the **ServiceLab** installation is located. Typically this is C:\Program Files\Service Lab 12.0
- 2.) Open the ServiceLab configuration file **servicelab.ini** which is located in the same directory if you use ServiceLab 9.0. If you are using ServiceLab 1 the servicelab.ini is located in a different folder, depending on your system settings (e.g. C:\Users\Public\PublicDocuments\ServiceLab\12.0.0\ENG).
- 3.) Open the configuration file **servicelab.ini** which is located in the same directory.
- 4.) Change the entry

DLL1=DLAB_UX1.DLL
to
DLL1=DT_DLAB_UX1.DLL
- 5.) Save the settings and start ServiceLab
- 6.) ServiceLab automatically loads the driver during startup.

5. Error Messages

Queue done: Increase the buffer size or decrease the sample rate.

6. Not supported yet / Limitations

- 1.) Quadrature Decoder inputs are not supported in streaming mode.
- 2.) Only one Counter input can be streamed together with the analog input channels.
- 3.) A maximum of 32 input channels (analog, digital, counter) can be acquired with one DT DAQ hardware using two AnalogInput modules.
- 4.) You cannot use our legacy driver DT32.dll in parallel. Please deactivate this driver via the menu Measurement -> Select Driver.
- 5.) Shunt calibration for the DT9838 is not available.

7. Technical Support

If you need any further information, Data Translations' Technical Support group is available to provide technical assistance. To request technical support, go to the support area on our web site www.DataTranslation.com. If you are located outside the U.S., go to www.DataTranslation.eu

8. Supported Data Translation DAQ Hardware

Data Translation DAQ Hardware	Input Streaming					Output Streaming		Single Value					Rate Generation
	A/D	Dig In	Counter	Quad Dec	Tacho	D/A	Dig Out	D/A	Dig In	Dig Out	Counter	Quad Dec	
DT9817-Series	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	✓	✓	✓	n/a	✓
DT9810 / DT9812-2,5	✓	n/a	n/a	n/a	n/a	✓	n/a	✓	✓	✓	✓	n/a	✓
DT981x-10V / DT981xA	✓	n/a	n/a	n/a	n/a	✓	n/a	✓	✓	✓	✓	n/a	✓
DT9816-Series	✓	n/a	n/a	n/a	n/a	n/a	n/a	n/a	✓	✓	✓	n/a	✓
DT9800-Series	✓	✓	n/a	n/a	n/a	n/a	n/a	✓	✓	✓	✓	n/a	✓
DT9818-Series	✓	✓	1 Counter	n/a	n/a	✓	✓	✓	✓	✓	✓	n/a	✓
DT9824	✓	✓	n/a	n/a	n/a	n/a	n/a	n/a	✓	✓	✓	n/a	n/a
DT9826-Series	✓	✓	no	n/a	no	n/a	n/a	n/a	✓	✓	✓	n/a	✓
DT9832-Series	✓	✓	1 Counter	no	n/a	✓	✓	✓	✓	✓	✓	✓	✓
DT9834-Series	✓	✓	1 Counter	n/a	n/a	✓	✓	✓	✓	✓	✓	n/a	✓
DT9836-Series	✓	✓	1 Counter	no	n/a	✓	✓	✓	✓	✓	✓	✓	✓
DT9837-Series ¹	✓	n/a	✓	n/a	✓	✓	n/a	✓	n/a	n/a	n/a	n/a	n/a
DT9838 ¹	✓	n/a	n/a	n/a	✓	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DT9847-Series ¹	✓	n/a	n/a	n/a	n/a	✓	n/a	✓	✓	✓	n/a	n/a	n/a
DT9850-Series	n/a	n/a	n/a	n/a	n/a	n/a	n/a	✓	✓	✓	✓	n/a	n/a
DT9862-Series ²	✓	✓	1 Counter	no	n/a	✓	✓	✓	✓	✓	✓	✓	✓
DT301x / DT3034-Series	✓	✓	n/a	n/a	n/a	✓	n/a	✓	✓	✓	✓	n/a	✓
DT300-Series	✓	✓	n/a	n/a	n/a	n/a	n/a	✓	✓	✓	✓	n/a	✓
DT3000-Series	✓	n/a	n/a	n/a	n/a	✓	n/a	✓	✓	✓	✓	n/a	✓

✓ supported by DT DAQ hardware and implemented in DASyLab-Driver (DT_Dlab_ux1.dll)

n/a not supported by hardware

no not supported in DASyLab-Driver

¹ Master/Slave Mode is supported

² Max. 3.125 MHz due to maximum buffer size in DASyLab of 65.535 Samples