

# Data Translation Driver for DASyLab®

Revision 6.7.5.0

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## 1. System Requirements

The Data Translation Driver for DASyLab supports multiple DT Open Layers DAQ devices (USB and PCI) from *DASyLab 9* to *DASyLab 13* for Windows 10 (32-bit and 64-Bit), Windows 8.1 / 8 (32-bit and 64-bit), Windows 7 (32-bit and 64-bit), Windows Vista (32-bit and 64-bit) and Windows XP (32-bit).

The device drivers (DT Open Layers) for the Data Translation DAQ devices must be installed before connecting the DT DAQ device to the host computer. At least version **7.6.0** of the **Data Acquisition OMNI CD** needs to be installed. Please run the installation program from the Data Acquisition OMNI CD to install the device drivers. The device drivers can also be downloaded free of charge from our Website.

To run the DASyLab driver installation automatically (see chapter 2), the Microsoft .NET Framework 4 needs to be installed. You also need full administrator permissions and DASyLab have to be installed in the standard DASyLab folders. At least, DASyLab have to be started once before, so that the **dasylib.ini** file is present.

## 2. Installation Instructions

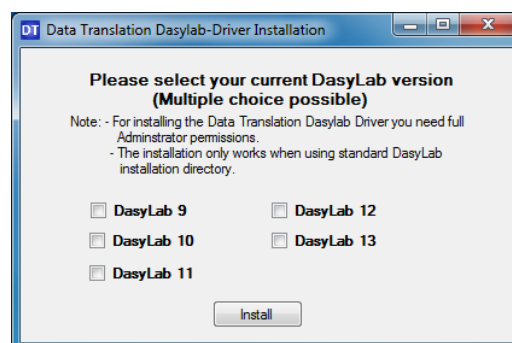
The Data Translation DASyLab driver can be installed automatically or manually. The automatic installation only works for DASyLab and is not supported for ServiceLab. Please see chapter 4 for the detailed installation instructions for ServiceLab.

### 2.1 Automatic driver installation

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

**DataTranslation-DASyLab-Driver-ux1.zip**

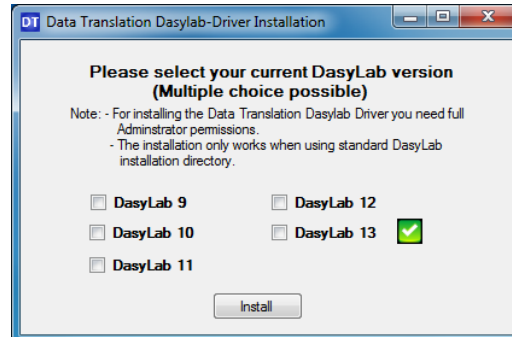
into the same directory on your hard disk drive. If you execute **DT\_Driver\_Installation.exe** the following dialog window appears:



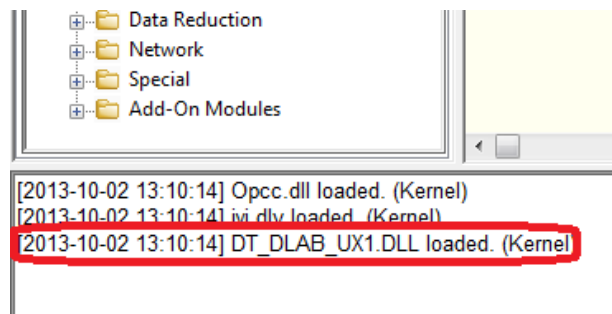
Please execute the exe-file with right-click and chose **Run As Administrator**. If you see a User Account Control prompt, accept it.

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

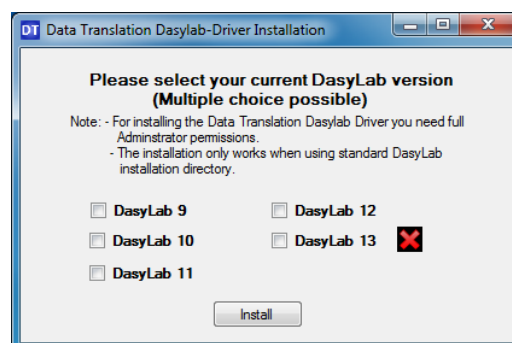
If the installation was successful, you will get a green box with an arrow behind the version you selected:



DASYLab then automatically loads the driver during startup. This can be checked within the info block:



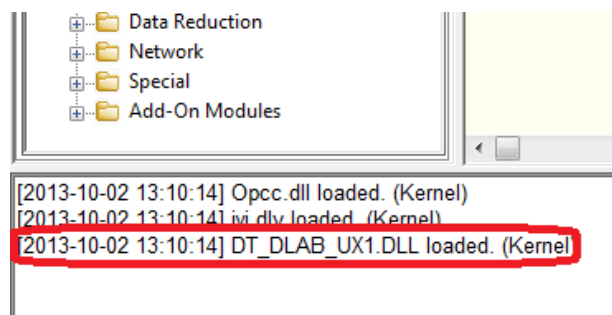
If the automatic installation was not successful, you will get a red cross behind the version you selected:



In this case we recommend installing the DASYLab driver manually (see chapter 2.2.).

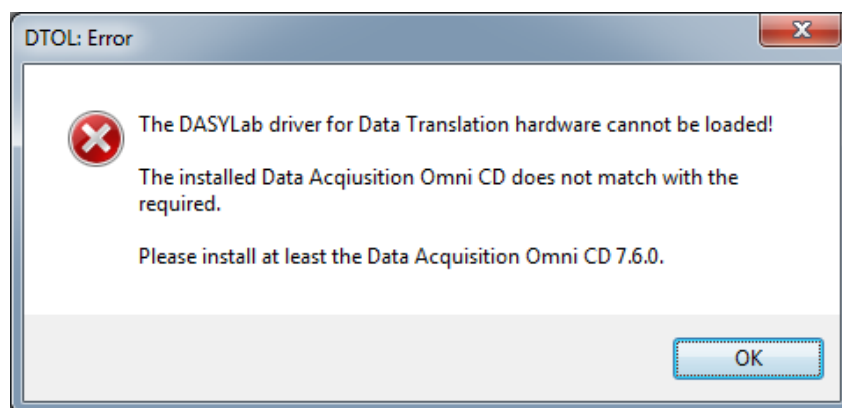
## 2.2 Manual driver installation

- 1.) Copy the Data Translation DASyLab driver file **DT\_DLab\_ux1.dll** into the directory where the DASyLab installation is located. Typically this is *C:\Program Files (x86)\DASyLab 13.0*
- 2.) Open the DASyLab configuration file **dasylab.ini** e.g. with the editor. If you are using DASyLab 10 or higher the ini file is normally located in the following folder:  
*C:\Users\Public\Documents\DASyLab\13.0.0\ENG*  
If you are using DASyLab 9.0, the ini file is located in the installation directory of DASyLab.
- 3.) Change the entry  
DLL1=DLAB\_UX1.DLL  
to  
DLL1=DT\_DLAB\_UX1.DLL
- 4.) Save the settings and start DASyLab
- 5.) DASyLab automatically loads the driver during startup. This can be checked within the info block:



## 2.3 Driver compatibility check at DASyLab startup

When DASyLab is started, the Data Translation Driver for DASyLab checks, if the correct Data Acquisition OMNI CD is installed. As mentioned before, at least version 7.6.0 must be installed, otherwise you get the following error message and the driver is not loaded:



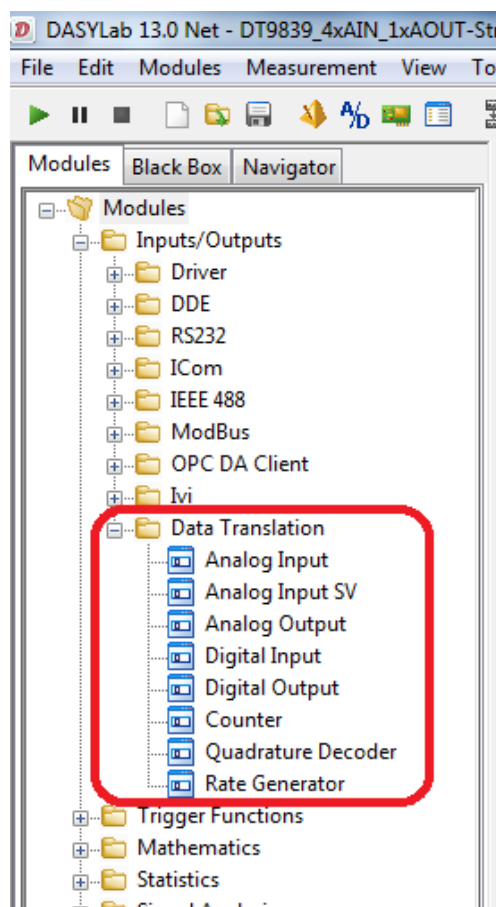
### 3. Data Translation Modules in DASyLab

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

**Modules → Inputs/Outputs → Data Translation**

which can be dragged & dropped onto the worksheet:

- 1.) Analog Input
- 2.) Analog Input SV
- 3.) Analog Output
- 4.) Digital Input
- 5.) Digital Output
- 6.) Counter
- 7.) Quadrature Decoder
- 8.) Rate Generator



### 3.1 Analog Input

The Analog Input Module is used for continuous (hardware-clocked) A/D conversions at a dedicated Sampling Rate.

Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this module:

- **SampleRate in Samples/s** which is the Sampling Rate per channel for DAQ devices with simultaneous analog inputs (1 A/D converter per channel) and the overall Sampling Rate for DAQ devices with multiplexer (1 A/D converter per device).
- **Buffer size per channel** which can be set up to a maximum of 65535 samples. We recommend using a value so that 10 buffers per second are used.

Example for hardware with **simultaneous analog inputs**:

Sample Rate: 50000 Samples/s => Buffer size: 5000

Example for hardware with **multiplexed analog inputs**:

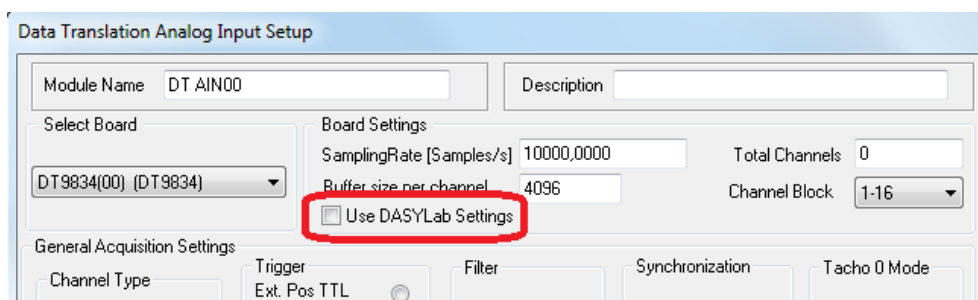
Sample Rate: 50000 Samples/s, 4 channels => Buffer size: 1250

- **Total Channels** which is needed if more than 16 input channels are streamed (for further information see chapter 3.1.13)
- **Channel Block** which is needed if more than 16 input channels are streamed (for further information see chapter 3.1.13)
- **Channel Type** which can be set to Differential or Single Ended
- **Trigger** can be set to External TTL (positive or negative), Analog Threshold or Software
- **Filter** which can be set to Raw (no filtering) or Moving Average e.g. for the DT9828-Series
- **Synchronization** for the DT9837-, DT9838-, DT9847- and DT9857E-Series only (for further information see chapter 3.1.12)
- **Tacho 0 Mode** for the DT9837A/B modules only (for further information see chapter 3.1.11)
- **Clock Source** can be set to Internal or External

### 3.1.1 Use the DASyLab Measurement Setup settings

Some measurement parameters can generally be set for DT DAQ devices within DASyLab. In the menu **Measurement → Measurement Setup → Driver** this can be done for the parameters **Sampling Rate** and **Block Size** (Buffer size).

This is helpful if you want configure several devices in the same way. You can use these general settings for your DT DAQ device(s) by selecting the checkbox **Use DASyLab Settings** in the Analog Input Module:



### 3.1.2 Global Variables for the Analog Input Module

The Analog Input Module supports global variables for:

- Sampling Rate
- Buffer Size
- Channel Name

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### 3.1.3 Configure input channels

Depending on your DT DAQ device, you can configure the **Sensor Type** in the tab **Name/Sensor** which can be configured as:

- Voltage
- Thermocouple
- RTD
- Thermistor
- Strain Gage / Bridge
- Resistance
- Current

The screenshot shows the 'Data Translation Analog Input Setup' dialog box. The 'Name/Sensor' tab is selected, and the 'Sensor Type' dropdown menu is open, showing the following options: Voltage, Voltage, RTD, Thermistors, Strain Gage / Bridge, Current, and Resistance. The 'Name' field is 'Channel 0' and the 'Unit' is 'V'. The 'Sensor Type' dropdown is highlighted with a red box.

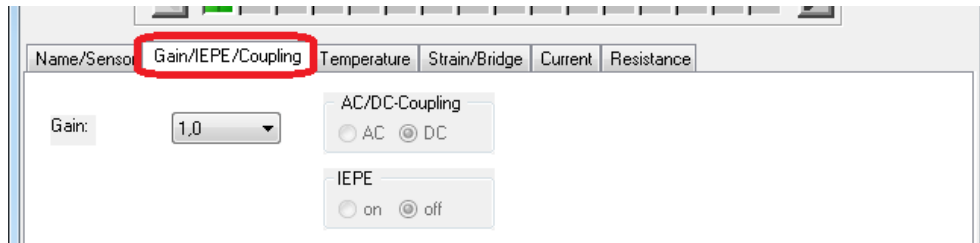
Once you have selected the **Sensor Type**, further settings for a channel can be made in the appropriate tab.

In the tab **Name/Sensor** you can also specify the **Name** and the **Unit** for the channels.



### 3.1.4 Configure Voltage channels

The parameters for **Voltage** channels can be adjusted in the tab **Gain/IEPE/Coupling**.

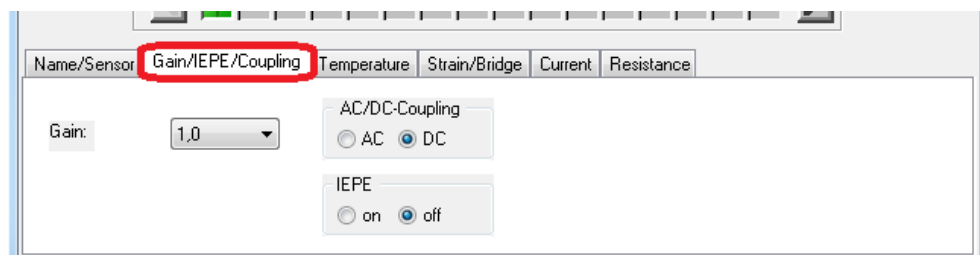


Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this tab:

- **Gain** can be set to 1, 2, 4, or 8 e.g. for the DT9834-Series or to 1 or 10 for the DT9837-Series

### 3.1.5 Configure IEPE/ICP channels

For DT DAQ hardware that supports IEPE/ICP inputs, you need to select **Voltage** as Sensor Type in the tab **Name/Sensor**. The parameters for **IEPE/ICP channels** can be adjusted in the tab **Gain/IEPE/Coupling**.



Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this tab:

- **AC/DC-Coupling** can be set to AC or DC e.g. for the DT9837-Series
- The **IEPE** current source (4mA / 2mA) can be turned on or off e.g. for the DT9837-Series

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### 3.1.6 Configure Temperature channels

The parameters for **Temperature** channels can be adjusted in the tab **Temperature**.

Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this tab:

- **For Thermocouples:**
  - **Thermocouple** Type can be set to B, E, J, K N, R, S or T
- **For RTDs:**
  - **Sensor Wiring** can be set to 4-Wire, 3-Wire or 2-Wire
  - **Sensor Type** can be set to Pt3750, Pt3850, Pt3911, ... or Custom  
If you select Custom, the parameters R0, Coeff. A, B, C can be adjusted as well
- **For Thermistors:**
  - **Sensor Wiring** can be set to 4-Wire, 3-Wire or 2-Wire
  - **Sensor Coefficients** Coeff. A, B, C can be adjusted

### 3.1.7 Configure Strain/Bridge channels

The parameters for **Strain/Bridge** channels can be adjusted in the tab **Strain/Bridge**.

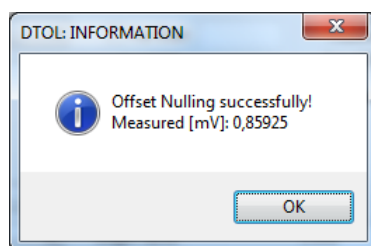
Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this tab:

- **For Strain Gages:**
  - **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:
    - o Quarter Bridge
    - o Quarter Bridge Temp Comp
    - o Full Bridge Axial Poisson
    - o Full Bridge Bending
    - o Full Bridge Bending Poisson
    - o Half Bridge Bending
    - o 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. For the DT9829-Series, the Excitation Voltage is fixed at 3V and cannot be changed.
- **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.
- **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**.



**Message when Offset Nulling was successful**

- **For Bridge Based Sensors:**

- **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. For the DT9829-Series, the Excitation Voltage is fixed at 3V and cannot be changed.

- **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]**

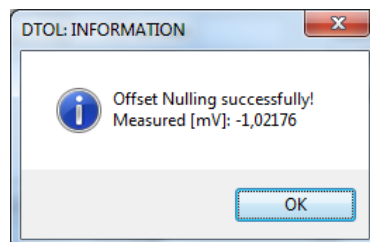
Specify the initial, unstrained voltage output of the bridge.

- **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.

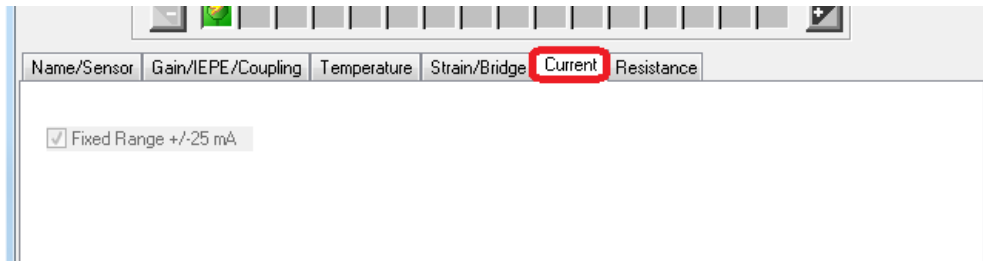
Note that you wish, you can change this value manually in the edit field **Initial Offset**.



**Message when Offset Nulling was successful**

### 3.1.8 Configure Current channels

The parameters for **Current** channels can be adjusted in the tab **Current**.

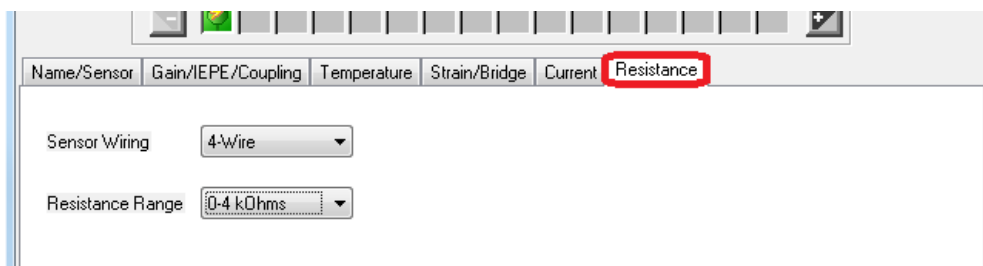


Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this tab:

- Currently only the DT9829-Series supports this feature and the range is fixed to  $\pm 25\text{mA}$

### 3.1.9 Configure Resistance channels

The parameters for **Resistance** channels can be adjusted in the tab **Resistance**.



Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this tab:

- **Sensor Wiring** can be 2-, 3- or 4-wire for the DT9829-Series
- **Resistance Range** can be 0-4 kOhms or 4-200kOhms for the DT9829-Series

### 3.1.10 Stream Digital Input, Counter, Quadrature Decoder and Tachometer channels

The Analog Input Module supports the possibility to stream

- Digital (DIN)
- Counter (CT) / Measure Counter (MCT)
- Quadrature Decoder (QD)
- Tachometer (Tacho)

channels along with the Analog Input (AIN) channels. This feature is not supported by all DT DAQ devices. Please check the specifications for your DT DAQ device.

**Data Translation Analog Input Setup**

Module Name: DT AIN00 Description:

Select Board: DT9834(00) (DT9834) Board Settings: SamplingRate [Samples/s]: 10000,0000 Total Channels: 0  
Buffer size per channel: 4096 Channel Block: 1-16  
☐ Use DASYLab Settings

General Acquisition Settings

Channel Type: ☐ Differential ☒ Single Ended  
Clock Source: ☒ Internal ☐ External  
Trigger: Ext. Pos TTL ☐ Ext. Neg TTL ☐ Analog Threshold ☐ Level [V]: 0,2 ☒ Software  
Filter: Raw ☐ Mov. Average ☐  
Synchronization: None ☒ Master ☐ Slave ☐  
Tacho 0 Mode: Zeros ☐ Prev. Meas. ☒

Channel Selection: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Name/Sensor: Gain/IEPE/Coupling Temperature Strain/Bridge Current Resistance  
Name: Channel 0 Sensor Type: Voltage  
Unit: V

DIN Counter Quad Tacho Stream other Subsystems

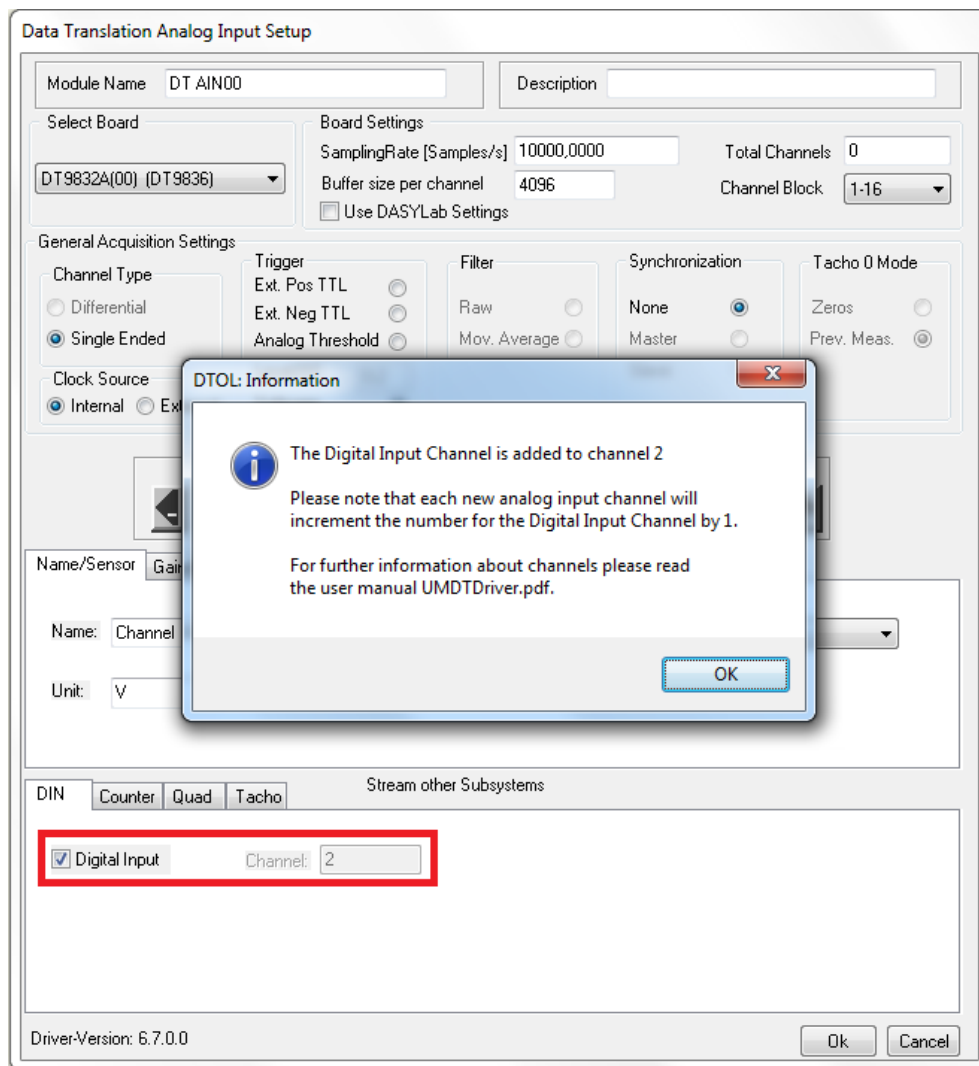
☒ Digital Input Channel: 1

Driver-Version: 6.5.0.0 Ok Cancel

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If you select the DIN channels to be streamed, please note that one channel is automatically added to the channel selection (channel list). The number of DIN channels can 8 bit or 16 bit (depending on your DT DAQ device).

In the screen shot below the streaming of the DIN channels is enabled and one channel is automatically added to the channel list and assigned as channel 2.



If you disable the streaming of the DIN channels, the assigned channel is automatically deleted in the channel list.

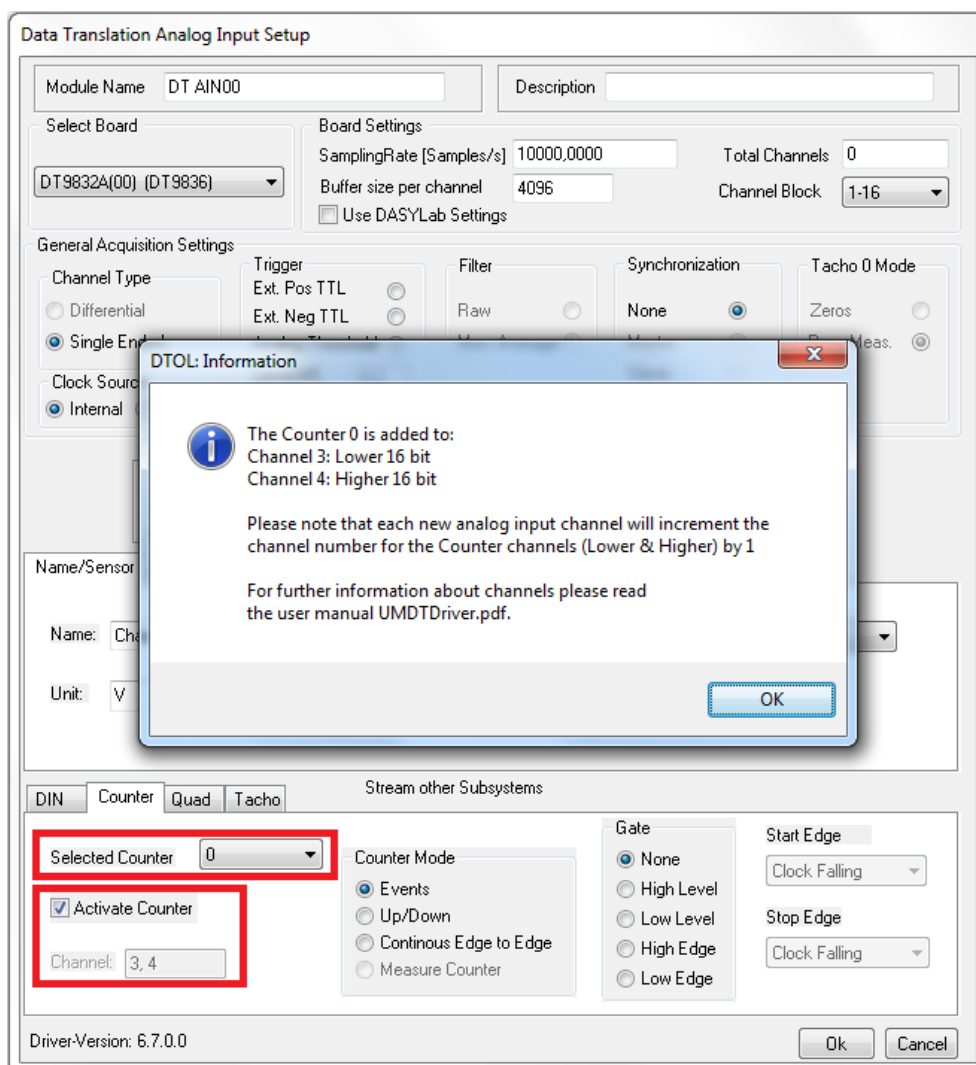
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Streaming of a CT channel in general needs two channels: One channel for the lower 16-bit (Low Byte) and one channel for the higher 16-bit (High Byte). These two channels are automatically added to the channel selection (channel list) when a CT channel is enabled.

**Exception:**

The CT channel(s) for the DT9826-, DT9844- and DT9857E-Series are always one channel with 32-bit.

In the screen shot below the streaming of the CT channel 0 is enabled and two channels are automatically added to the channel list and assigned as channel 3 and 4.



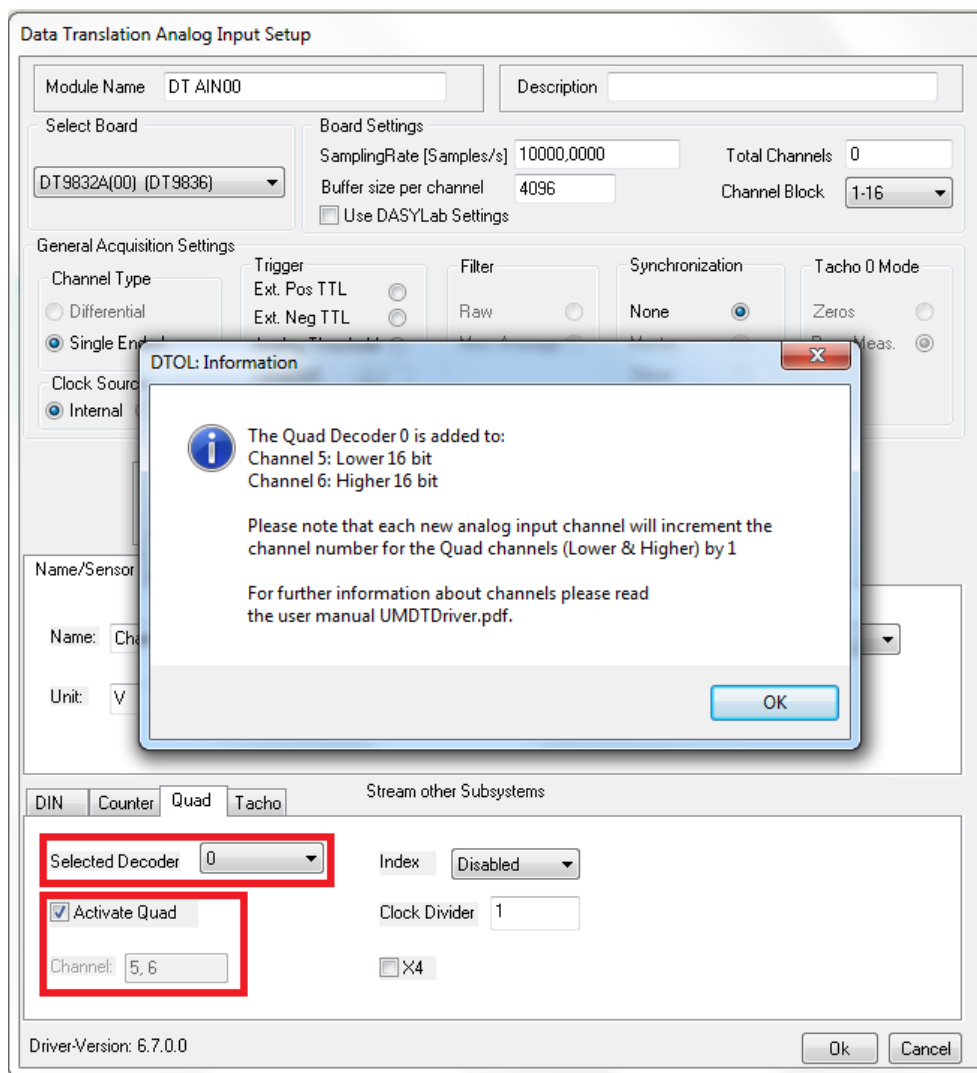
If you disable the streaming of the CT channels, the assigned channels are automatically deleted in the channel list.



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Streaming of a QD channel also 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 are automatically added to the channel selection (channel list) when a QD channel is enabled.

In the screen shot below the streaming of the Quad Decoder Input Channel 0 is enabled and two channels are automatically added to the channel list and assigned as channel 5 and 6.



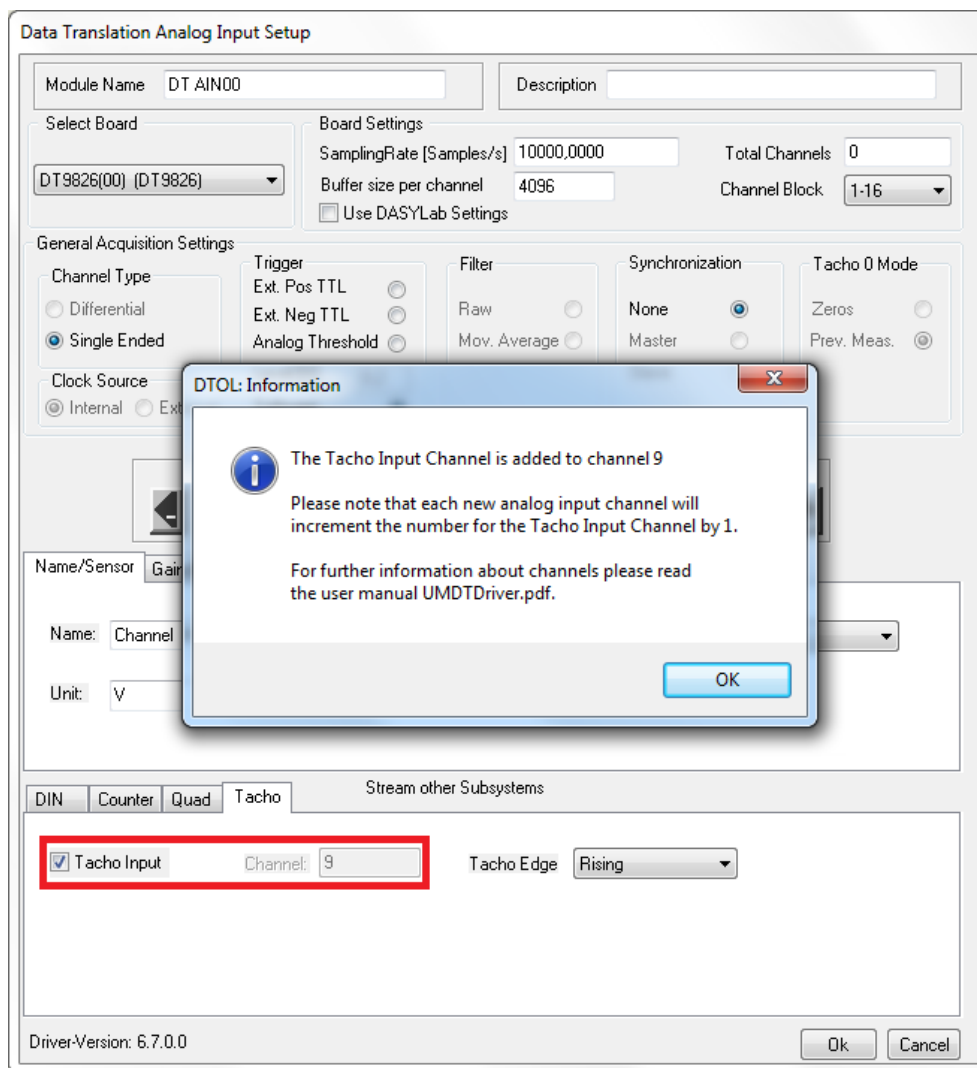
If you disable the streaming of the QD channels, the assigned channels are automatically deleted in the channel list.

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Streaming of a Tacho input channel only needs one single channel with 32-Bit and is supported by the modules of the DT9826- and DT9857E-Series.

The modules of the DT9837-, DT9838- and DT9839-Series also offer a Tacho input channel, but the configuration of the Tacho is done in another way (for further information see chapter 3.1.11).

In the screen shot below the streaming of the Tacho is enabled and one channel is automatically added to the channel list and assigned as channel 9.



If you disable the streaming of the Tacho channel, the assigned channel is automatically deleted in the channel list.

The order of the channels in the channel list of Analog Input Module is always: **AIN → DIN → CT → QD**

**Exceptions:**

For the DT9826-Series: AIN → Tacho → CT → DIN

For the DT9857E-Series: AIN → Tacho → CT → MCT → DIN

**Here are some examples:**

Three analog input channels:

AIN 0	AIN 1	AIN 2
Channel 0	Channel 1	Channel 2

Three analog inputs channels and DIN:

AIN 0	AIN 1	AIN 2	DIN
Channel 0	Channel 1	Channel 2	Channel 3

Three analog input channels and one Counter channel:

AIN 0	AIN 1	AIN 2	CT Low	CT High
Channel 0	Channel 1	Channel 2	Channel 3	Channel 4

Three analog input channels and one Quad Decoder channel:

AIN 0	AIN 1	AIN 2	QD Low	QD High
Channel 0	Channel 1	Channel 2	Channel 3	Channel 4

Three analog input channels, DIN, one Counter channel and one Quadrature Decoder channel:

AIN 0	AIN 1	AIN 2	DIN	CT Low	CT High	QD Low	QD High
Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7

**DT9826-Series:** Three analog input channels, one Tachometer, one Counter and DIN:

AIN 0	AIN 1	AIN 2	Tacho	CT (32-bit)	DIN (8-Bit)
Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5

**DT9844-Series:** Three analog input channels, DIN and one Counter:

AIN 0	AIN 1	AIN 2	DIN (16-Bit)	CT (32-bit)
Channel 0	Channel 1	Channel 2	Channel 3	Channel 4

**DT9857E-Series:** Three analog input channels, one Tachometer, one Counter, one Measure Counter, DIN:

AIN 0	AIN 1	AIN 2	Tacho	CT (32-bit)	MCT (32-bit)	DIN (8-Bit)
Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6

### 3.1.11 Configure the Tachometer of DT9837, DT9837A/B, DT9838 and DT9839

You can measure frequency or period of the tachometer input signal using Tachometer Input channel 0.

The screenshot shows the 'Data Translation Analog Input Setup' dialog box. The 'Module Name' is 'DT AIN00' and the 'Description' is empty. The 'Select Board' dropdown is set to 'DT9837-A(00) (DT9837A)'. The 'Board Settings' section shows 'SamplingRate [Samples/s]' as 10000.0000, 'Buffer size per channel' as 4096, and 'Channel Block' as 1-16. The 'General Acquisition Settings' section includes 'Channel Type' (Single Ended), 'Clock Source' (Internal), 'Trigger' (Ext. Pos TTL), 'Filter' (Raw), 'Synchronization' (None), and 'Tacho 0 Mode' (Prev. Meas.). The 'Tacho 0 Mode' section is highlighted with a red rectangle, showing 'Zeros' and 'Prev. Meas.' options. The 'Prev. Meas.' option is selected. The 'Gain' is set to 1.0, and the 'AC/DC-Coupling' is set to DC. The 'IEPE' option is set to off. The 'DIN' section shows 'Counter', 'Quad', and 'Tacho' options, with 'Tacho' selected. The 'Stream other Subsystems' checkbox is unchecked. The 'Driver-Version' is 6.5.0.0. The 'Ok' and 'Cancel' buttons are at the bottom right.

The Tachometer 0 of the DT9837A and DT9837B provides two measure modes:

- **Zeros** if you want to read a value of 0 between measurements
- **Previous Measurement** if you want to read the previous measurement value if the new measurement value is not yet complete

**For the modules DT9837, DT9838 and DT9839, the measure mode for the Tachometer 0 is always Previous Measurement.**

### 3.1.12 Synchronize multiple DT9837A/B/C, DT9838, DT9847 or DT9857E modules

You can synchronize multiple DT9837A/B/C, DT9838, DT9847 or DT 9857E devices via the built in synchronization port.

The screenshot shows the 'Data Translation Analog Input Setup' dialog box. The 'Synchronization' section is highlighted with a red box, indicating the selection of 'None' for synchronization. Other settings visible include:


- Module Name: DT AIN00
- Description: (empty)
- Select Board: DT9837-A(00) (DT9837A)
- Board Settings:
  - SamplingRate [Samples/s]: 10000,0000
  - Buffer size per channel: 4096
  - Use DASYLab Settings: ☐
  - Total Channels: 0
  - Channel Block: 1-16
- General Acquisition Settings:
  - Channel Type: ☒ Single Ended
  - Clock Source: ☒ Internal
  - Trigger: ☐ Software
  - Filter: ☐ Raw
  - Level [V]: 0,2
- Tacho 0 Mode: ☒ Prev. Meas.
- Name/Sensor: Gain/IEPE/Coupling, Temperature, Strain/Bridge, Current, Resistance
- Name: Channel 0
- Sensor Type: Voltage
- Unit: V
- DIN: Counter, Quad, Tacho
- Stream other Subsystems: ☐ Digital Input
- Channel: (empty)
- Driver-Version: 6.5.0.0
- Buttons: Ok, Cancel

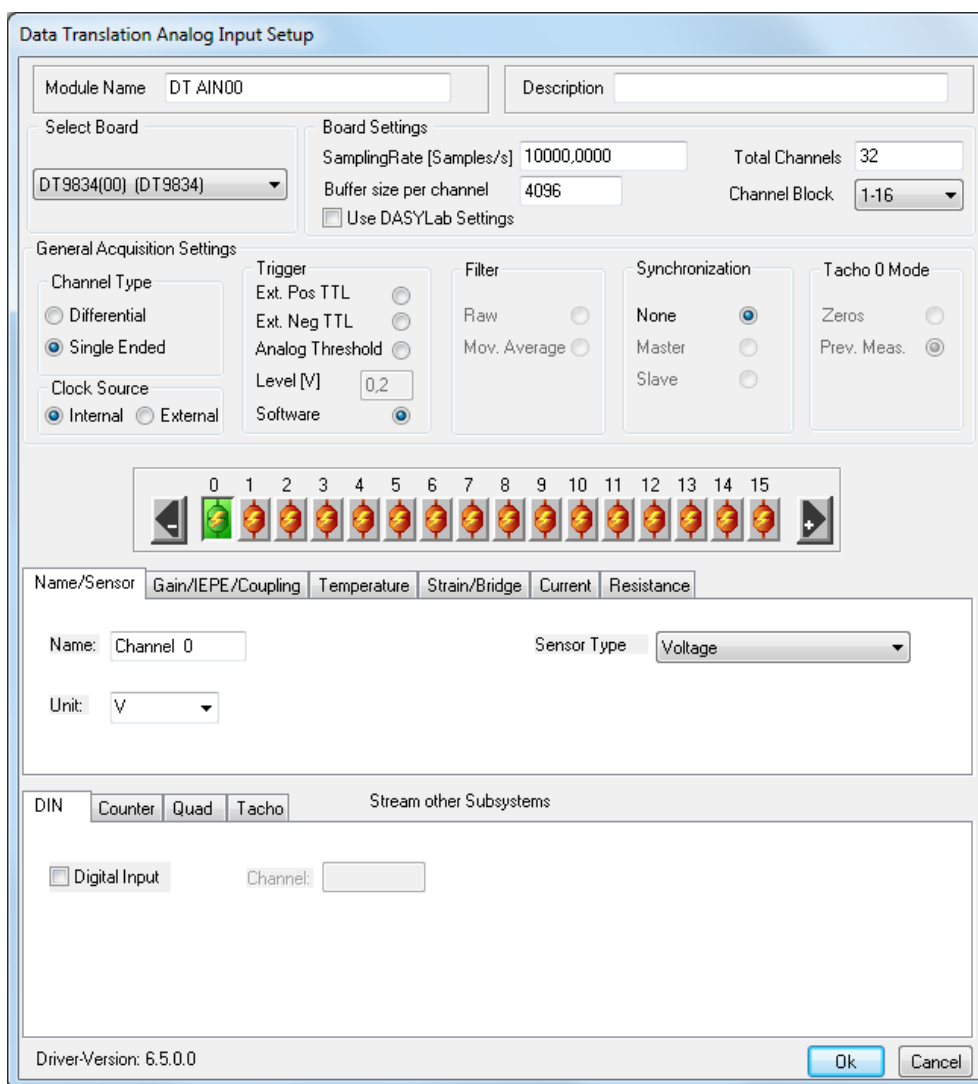
Please ensure that the slave devices are selected in the first Analog Input Module(s) you place on the worksheet and the master device is selected in the last Analog Input Module you place on the worksheet.

***This sequence is mandatory, because the DT DAQ device which is selected in the first Analog Input Module is started at first by DASYLab. Slave devices must be started before the master device.***

### 3.1.13 Configure DT DAQ devices with more than 16 analog input channels

DASYLab does not provide modules with more than 16 input or output channels. If you want to acquire e.g. all 32 analog input channels of the USB DAQ module DT9844-32 or PCI DAQ board DT3034 you need to use **two** Analog Input Modules. Please ensure the following sequence:

- 1.) Drag & Drop an Analog Input Module on the worksheet.
- 2.) Select the DT DAQ device.
- 3.) Configure the channel and hardware settings.
- 4.) In the text field **Total Channels** enter the number of analog input channels you want to acquire.
- 5.) Add the 16 channels by clicking on the  button.
- 6.) The streaming of other subsystems must be configured in the first Analog Input Module.
- 7.) Click on **Ok** to close the dialog.



**Data Translation Analog Input Setup**

Module Name: DT AIN00 Description:

Select Board: DT9834(00) (DT9834)

Board Settings: SamplingRate [Samples/s]: 10000.0000 Total Channels: 32  
 Buffer size per channel: 4096 Channel Block: 1-16  
☐ Use DASYLab Settings

General Acquisition Settings

Channel Type: ☐ Differential ☒ Single Ended

Clock Source: ☒ Internal ☐ External

Trigger: ☐ Ext. Pos TTL ☐ Ext. Neg TTL ☐ Analog Threshold Level [V]: 0.2 ☒ Software

Filter: ☐ Raw ☐ Mov. Average

Synchronization: ☐ None ☒ Master ☐ Slave

Tacho 0 Mode: ☐ Zeros ☒ Prev. Meas.

Channel Selection: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15


Name/Sensor: Gain/IEPE/Coupling Temperature Strain/Bridge Current Resistance

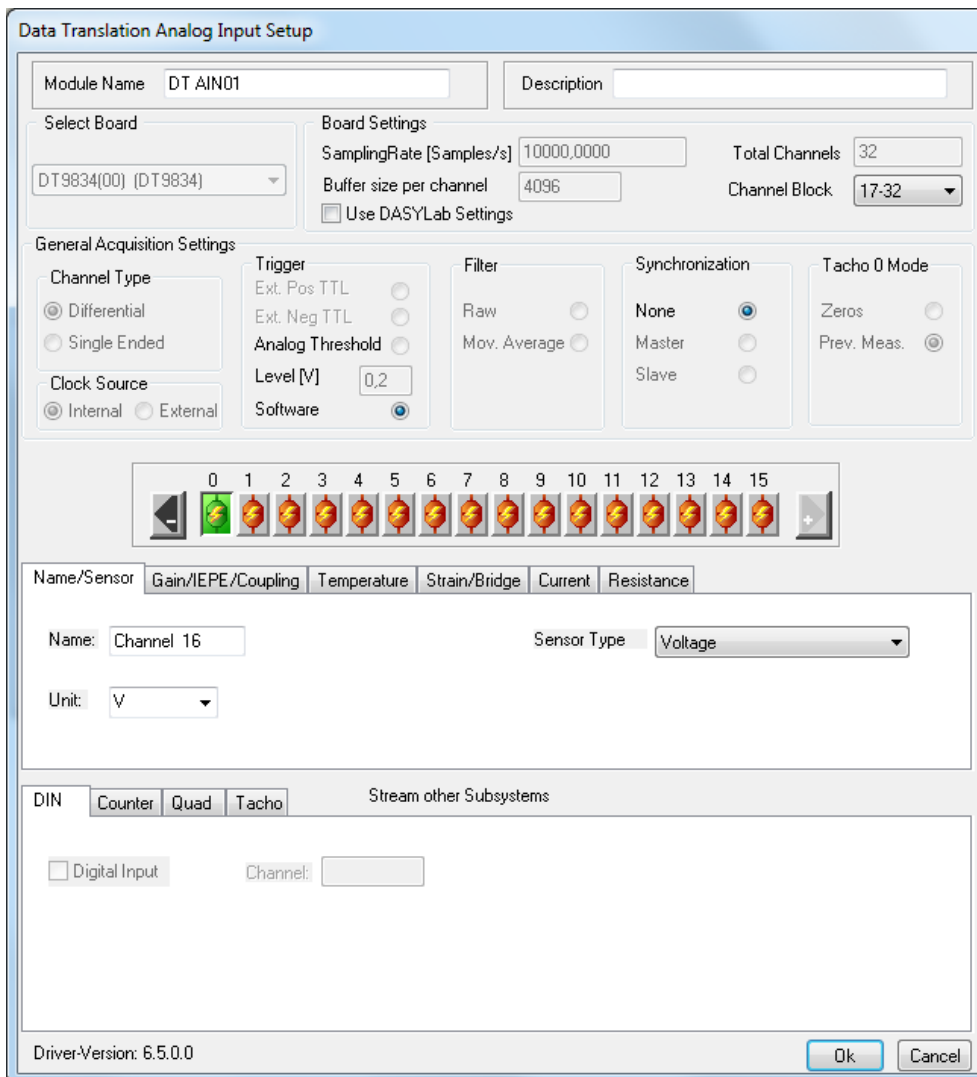
Name: Channel 0 Sensor Type: Voltage Unit: V

DIN: Counter Quad Tacho Stream other Subsystems

☐ Digital Input Channel:

Driver-Version: 6.5.0.0 Ok Cancel

- 8.) Drag & Drop a second Analog Input Module on the worksheet.
- 9.) Select the **Channel Block 17-32** first.
- 10.) The settings for Sampling Rate, Buffer size per Channel and Total Channels are automatically set.
- 11.) Add the 16+ channels by clicking on the  button.
- 12.) Click on **Ok** to close the dialog.



**Data Translation Analog Input Setup**

Module Name: DT AIN01 Description:

Select Board: DT9834(00) (DT9834)

Board Settings: SamplingRate [Samples/s]: 10000,0000 Total Channels: 32  
Buffer size per channel: 4096 Channel Block: 17-32  
☐ Use DASYLab Settings

General Acquisition Settings

Channel Type: ☒ Differential ☐ Single Ended

Clock Source: ☒ Internal ☐ External

Trigger: ☐ Ext. Pos TTL ☐ Ext. Neg TTL ☐ Analog Threshold Level [V]: 0,2 ☒ Software

Filter: ☐ Raw ☐ Mov. Average

Synchronization: ☒ None ☐ Master ☐ Slave

Tacho 0 Mode: ☐ Zeros ☒ Prev. Meas.

Channel Selection: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Name/Sensor: Gain/IEPE/Coupling Temperature Strain/Bridge Current Resistance

Name: Channel 16 Sensor Type: Voltage

Unit: V

DIN: Counter Quad Tacho Stream other Subsystems

☐ Digital Input Channel:

Driver-Version: 6.5.0.0 Ok Cancel

- 13.) If you want to acquire more than 32 channels with your DT DAQ device you need to use a third Analog Input Module (Channel Block 33-48) or even a fourth Analog Input Module (Channel Block 49-64).

### 3.2 Analog Input SV (Single Value)

Single Value operations (software-clocked) are the simplest to use to perform A/D conversions. The DAQ device acquires the data from the specified input channel(s) and returns the data immediately.

The screenshot shows the 'Data Translation Single Value Analog Input Setup' dialog box. It has a light blue title bar and a white background. At the top, there are two text boxes: 'Module Name:' containing 'DT AIN SV00' and 'Description:'. Below these are two sections: 'Device Selection' with a dropdown menu showing 'DT9834(00) (DT9834)' and 'Board Settings' with 'Refresh Rate [ms]' set to '100', 'Total Channels' set to '0', and 'Channel Block' set to '1-16'. In the center is a row of 16 channel status icons, numbered 0 to 15. Icon 0 is green with a lightning bolt, while icons 1-15 are orange with a lightning bolt. Below the icons are two sections: 'Channel Type' with radio buttons for 'Differential' and 'Single Ended' (selected), and 'Settings Per Channel' for 'Channel 0'. The settings include 'Name:' (Channel 0), 'Gain:' (1.0), 'Unit:' (V), 'Thermocouple:' (NONE), 'AC/DC-Coupling' (radio buttons for AC and DC, with DC selected), and 'Set IEPE' (radio buttons for on and off, with off selected). At the bottom left is 'Driver-Version: 6.5.0.0', and at the bottom right are 'Ok' and 'Cancel' buttons.

Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this module:

- **Refresh Rate in ms** between 50 and 60000 ms
- **Total Channels** which is needed if more than 16 analog input channels are used (for further information see chapter 3.1.13)
- **Block Channels** which is needed if more than 16 analog input channels are used (for further information see chapter 3.1.13)
- **Channel Type** which can be set to Differential or Single Ended
- **Gain** which can be set to 1, 2, 4, or 8 e.g. for the DT9834-Series
- **Thermocouple** Type like None (Voltage readings), Type K, Type J, ... e.g. for the DT9828-Series
- **AC/DC-Coupling** can be set to AC or DC e.g. for the DT9837- and DT9847-Series
- **Set IEPE** can be set to AC or DC e.g. for the DT9837- and DT9847-Series



### 3.3 Analog Output

The Analog Output Module is used for single value (software-clocked) or continuous (hardware-clocked) D/A conversions.

Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this module:

- **Output Range** can be set to e.g.  $\pm 3V$  or  $\pm 10V$  for the DT9847-Series
- **Output Mode** can be set to Single Value or Continuous Streaming
- **Trigger** settings
- **Clock Source** settings
- Set **Output to 0 Volts at Stop of measurement**

#### 3.3.1 Use the analog output of DT9837A/C, DT9839- DT9847-, and DT9857E-Series

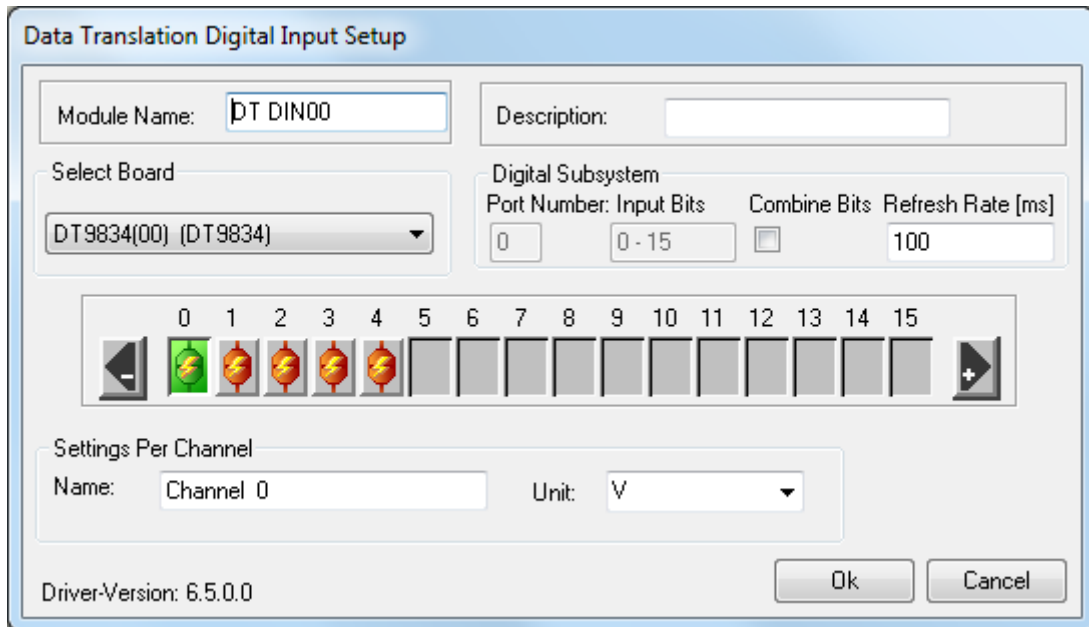
The minimum output rate of the analog output channel in streaming mode for the DT9837A, DT9837C and the DT9839-Series is 10 kHz. For the DT9847- and DT9857E-Series the minimum output rate for the analog output channel(s) is 30 kHz. Therefore please ensure that these values are set to  $\geq 10$  kHz respectively  $\geq 30$  kHz within DASYLab. You can adjust these values in the following menus:

**Measurement → Time Bases → All Settings**

**Measurement → Measurement Setup → Driver**

### 3.4 Digital Input

The Digital Input module is used for single value digital input operations.



The dialog box is titled "Data Translation Digital Input Setup". It contains the following fields and controls:

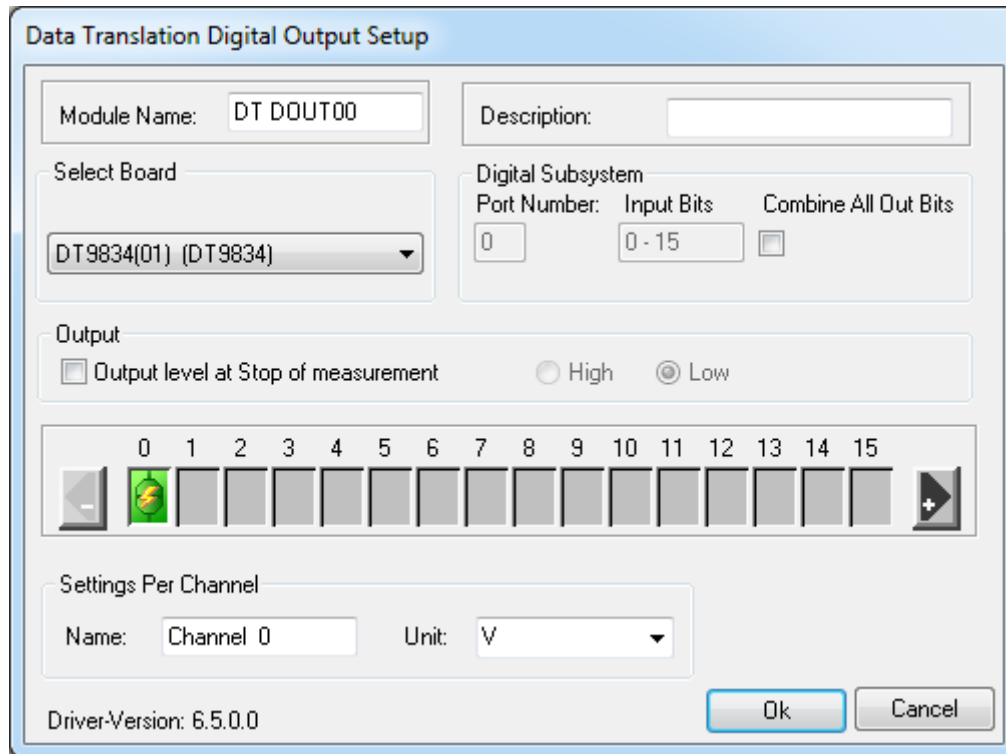
- Module Name:** A text box containing "DT DIN00".
- Description:** An empty text box.
- Select Board:** A dropdown menu showing "DT9834(00) (DT9834)".
- Digital Subsystem:** A section containing:
  - Port Number:** A text box with "0".
  - Input Bits:** A text box with "0 - 15".
  - Combine Bits:** An unchecked checkbox.
  - Refresh Rate [ms]:** A text box with "100".
- Channel Selection:** A row of 16 buttons labeled 0 to 15. Buttons 0, 1, 2, 3, and 4 are highlighted with green and red lightning bolt icons. Buttons 5 through 15 are grey. Navigation arrows are on the left and right of the row.
- Settings Per Channel:** A section containing:
  - Name:** A text box with "Channel 0".
  - Unit:** A dropdown menu showing "V".
- Driver-Version:** A text box at the bottom left showing "6.5.0.0".
- Buttons:** "Ok" and "Cancel" buttons at the bottom right.

Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this module:

- **Refresh Rate in ms** between 50 and 1000 ms
- **Combine Bits** to read e.g. 8 digital input bit as one 8 bit value

### 3.5 Digital Output

The Digital Output module is used for single value digital output operations.



The dialog box is titled "Data Translation Digital Output Setup". It contains the following fields and controls:

- Module Name:** A text box containing "DT DOUT00".
- Description:** An empty text box.
- Select Board:** A dropdown menu showing "DT9834(01) (DT9834)".
- Digital Subsystem:** A section containing:
  - Port Number:** A text box with "0".
  - Input Bits:** A text box with "0 - 15".
  - Combine All Out Bits:** An unchecked checkbox.
- Output:** A section containing:
  - Output level at Stop of measurement:** An unchecked checkbox.
  - High/Low:** Two radio buttons, with "Low" selected.
- Bit Channels:** A row of 16 checkboxes labeled 0 through 15. Checkboxes 0 and 1 are checked, and a green lightning bolt icon is next to checkbox 0.
- Settings Per Channel:** A section containing:
  - Name:** A text box with "Channel 0".
  - Unit:** A dropdown menu with "V" selected.
- Driver-Version:** A text box at the bottom left showing "6.5.0.0".
- Buttons:** "Ok" and "Cancel" buttons at the bottom right.

Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this module:

- **Output level at Stop of measurement** can be set to High or low
- **Combine Bits All Out Bits** to write e.g. 8 digital output bit as one 8 bit value

### 3.6 Counter

The Counter Module is used for single value counting operations.

The screenshot shows the 'Data Translation Counter' configuration window. It includes fields for 'Module Name' (DT CTR00), 'Description', 'Select Board' (DT9834(00) (DT98)), 'Port Number' (0), 'Counter Subsystem' (1,0000), and 'Start/Stop Edge' (both set to Gate Risin). Below these is a row of 16 channel icons, with channel 1 highlighted. The 'Settings Per Channel' section shows 'Name: Channel 0' and 'Unit: V'. The 'Counter Mode' section has radio buttons for 'Events' (selected), 'Frequency', 'Up/Down', and 'Edge to Edge'. The 'Gate' section has radio buttons for 'None' (selected), 'High Level', 'Low Level', 'High Edge', and 'Low Edge'. At the bottom, it shows 'Driver-Version: 6.5.0.0' and 'Ok'/'Cancel' buttons.

Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this module:

- **Counter Mode** can be set to Events, Up/Down, Frequency or Edge to Edge
- **Start/Stop Edge**
- **Count Duration**
- **Gate Type**

The Counter module always uses the first/next available subsystem element. The field **Port Number** shows the number of the subsystem used. You can't configure/change this!

#### 3.6.1 Global Variables for the Counter Module

The Counter Module supports a global variable for the Count Duration.

### 3.7 Quadrature Decoder

The Quadrature Decode Module is used for single value counting operations.

The screenshot shows the 'Data Translation Quadrature Decoder Input Setup' dialog box. It contains the following fields and controls:

- Module Name:** DT QUAD00
- Description:** (empty text box)
- Select Board:** DT9836(00) (DT983E) (dropdown menu)
- Port Number:** 2 (text box)
- Quadrature Decoder Subsystem:**
  - Index:** Index Low (dropdown menu)
  - Refresh Rate [ms]:** 100 (text box)
  - Clock Divider:** 1 (text box)
  - X4 Mode:** (checked checkbox)
- Channel Selection:** A row of 16 icons representing channels 0 to 15. Channel 0 is highlighted with a green icon, while others are blue. A plus icon is at the end of the row.
- Settings Per Channel:**
  - Name:** Channel 0 (text box)
  - Unit:** V (dropdown menu)
- Driver-Version:** 6.5.0.0
- Buttons:** Ok and Cancel

Hardware specific settings (dependent on your DT DAQ device) can be adjusted in this module:

- **Index** can be set to Low, High or None
- **Clock Divider**
- **Refresh Rate in ms** between 50 and 1000 ms
- **X4 Mode** can be activated or deactivated

The Quadrature Decoder module always uses the first/next available subsystem element. The field **Port Number** shows the number of the subsystem used. You can't configure/change this!

### 3.8 Rate Generator

The Rate Generator Module is used for frequency/rate generation.

**Data Translation Rate Generator**

Module Name: DT RateGen00 Description:

Select Board: DT9834(00) (I Port Number: 1

Pulse Settings: Width [0% - 100%]: 50,0 Frequency [Hz]: 1000,0

Settings Per Channel: Name: Channel 0 Unit: V

Rate Generator Mode: ☒ Rate Generator ☐ One Shot ☐ Repetitive One Shot

Clock Settings: ☒ Internal ☐ External Divider: 2

Gate: ☒ None ☐ High Level ☐ Low Level ☐ High Edge ☐ Low Edge

Driver-Version: 6.5.0.0 Ok Cancel

Hardware specific settings (dependent on your DAQ device) can be adjusted in this module:

- **Rate Generator Mode**
- **Clock Settings**
- **Gate**
- **Pulse Settings**

The Rate Generator Module always uses the first/next available subsystem element. The field **Port Number** in this module shows the number of the subsystem used. You can't configure/change this!

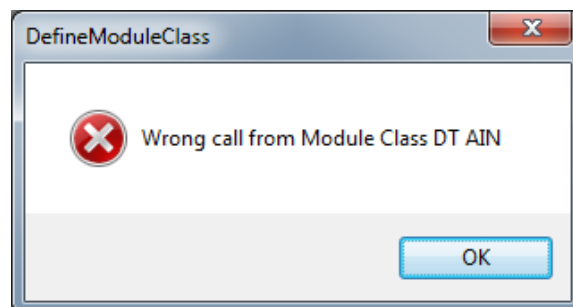
## 4. Installation under ServiceLab

For ServiceLab, there is no automatic installation available and driver files must be copied and the ini file 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 (x86)\Service Lab 12.0
- 2.) Open the ServiceLab configuration file **servicelab.ini** e.g. with the editor. If you are using ServiceLab 10 or higher the ini file is normally located in the following folder:  
C:\Users\Public\PublicDocuments\ServiceLab\12.0.0\ENG  
If you use ServiceLab 9.0, the ini file is located in the installation directory of DASYLab.
- 3.) Change the entry  
DLL1=DLAB\_UX1.DLL  
to  
DLL1=DT\_DLAB\_UX1.DLL
- 4.) Save the settings and start ServiceLab
- 5.) ServiceLab automatically loads the driver during startup.
- 6.) DASYLab automatically loads the driver during startup.

## 5. Error Messages

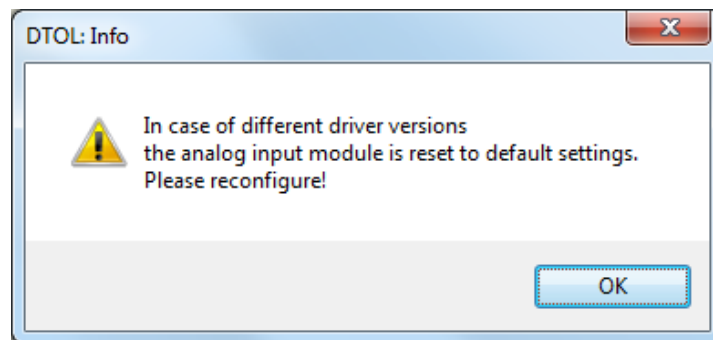
If the entry `DLLx=DT_DLAB_UX1.DLL` is present more than once in the `dasyLab.ini`, the following message appears:



Please make sure, that only one entry for the Data Translation driver is present within the ini file.

## 6. Not supported yet / Limitations

- 1.) A maximum of 64 input channels (analog, digital, counter, quadrature decoder, tachometer) can be acquired from one DT DAQ hardware using up to four Analog Input Modules.
- 2.) You cannot use our legacy driver DT32.dll in parallel. Please deactivate this driver in the menu **Measurement -> Select Driver**
- 3.) Shunt calibration for the DT9838 is not available.
- 4.) If you have used an older version of the Data Translation Driver for DASyLab (< Version 6.1.0.0) before, the settings within the Analog Input Modules are not loaded properly and you have to reconfigure these Analog Input Modules.



## 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](http://www.DataTranslation.com). If you are located outside the U.S., go to [www.DataTranslation.eu](http://www.DataTranslation.eu)



## 8. Supported Data Translation DAQ Hardware

	Input Streaming					Output Streaming		Single Value						Rate Generation
	A/D	Dig In	Counter	Quad Dec	Tacho	D/A	Dig Out	A/D	D/A	Dig In	Dig Out	Counter	Quad Dec	
USB DAQ Modules														
DT9800 Series	✓	✓	–	–	–	–	–	✓	✓	✓	✓	✓	–	✓
DT9810 / DT9812-2.5V	✓	–	–	–	–	✓	–	✓	✓	✓	✓	✓	–	✓
DT981x-10V / DT981xA	✓	–	–	–	–	✓	–	✓	✓	✓	✓	✓	–	✓
DT9816 Series	✓	–	–	–	–	–	–	✓	–	✓	✓	✓	–	✓
DT9817 Series	–	–	–	–	–	–	–	–	–	✓	✓	✓	–	✓
DT9818 Series	✓	✓	✓	–	–	✓	✓	✓	✓	✓	✓	✓	–	✓
DT9824 Series	✓	✓	–	–	–	–	–	✓	–	✓	✓	✓	–	–
DT9826 Series	✓	✓	✓	–	✓	–	–	✓	–	✓	✓	✓	–	✓
DT9828 Series	✓	✓	–	–	–	–	–	–	–	✓	✓	–	–	–
DT9829 Series	✓	✓	–	–	–	–	–	–	–	✓	✓	–	–	–
DT9832 Series	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
DT9834 Series	✓	✓	✓	–	–	✓	✓	✓	✓	✓	✓	✓	–	✓
DT9836 Series	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
DT9837 Series <sup>1</sup>	✓	–	–	–	✓	✓	–	✓	✓	–	–	–	–	–
DT9838 Series <sup>1</sup>	✓	–	–	–	✓	–	–	–	–	–	–	–	–	–
DT9839 Series	✓	–	–	–	✓	✓	–	✓	✓	✓	✓	–	–	–
DT9844 Series	✓	✓	✓	–	–	–	–	✓	–	✓	✓	✓	–	✓
DT9847 Series <sup>1</sup>	✓	–	–	–	–	✓	–	✓	✓	✓	✓	–	–	–
DT9850 Series	–	–	–	–	–	✓	–	–	✓	✓	✓	✓	–	–
DT9857E Series <sup>1</sup>	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	–	✓
DT9862 Series <sup>2</sup>	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
DT9874 Series	✓	✓	–	–	–	–	–	–	–	✓	✓	–	–	–
PCI DAQ Boards														
DT300 Series	✓	✓	–	–	–	–	–	✓	✓	✓	✓	✓	–	✓
DT3000 Series	✓	–	–	–	–	✓	–	✓	✓	✓	✓	✓	–	✓
DT3010 / DT3016 Series	✓	✓	–	–	–	✓	–	✓	✓	✓	✓	✓	–	✓

<sup>1</sup> Master/Slave Mode supported

<sup>2</sup> Maximum of 3,125 MHz per channel due to max. buffer size in DASyLab of 65535 Samples