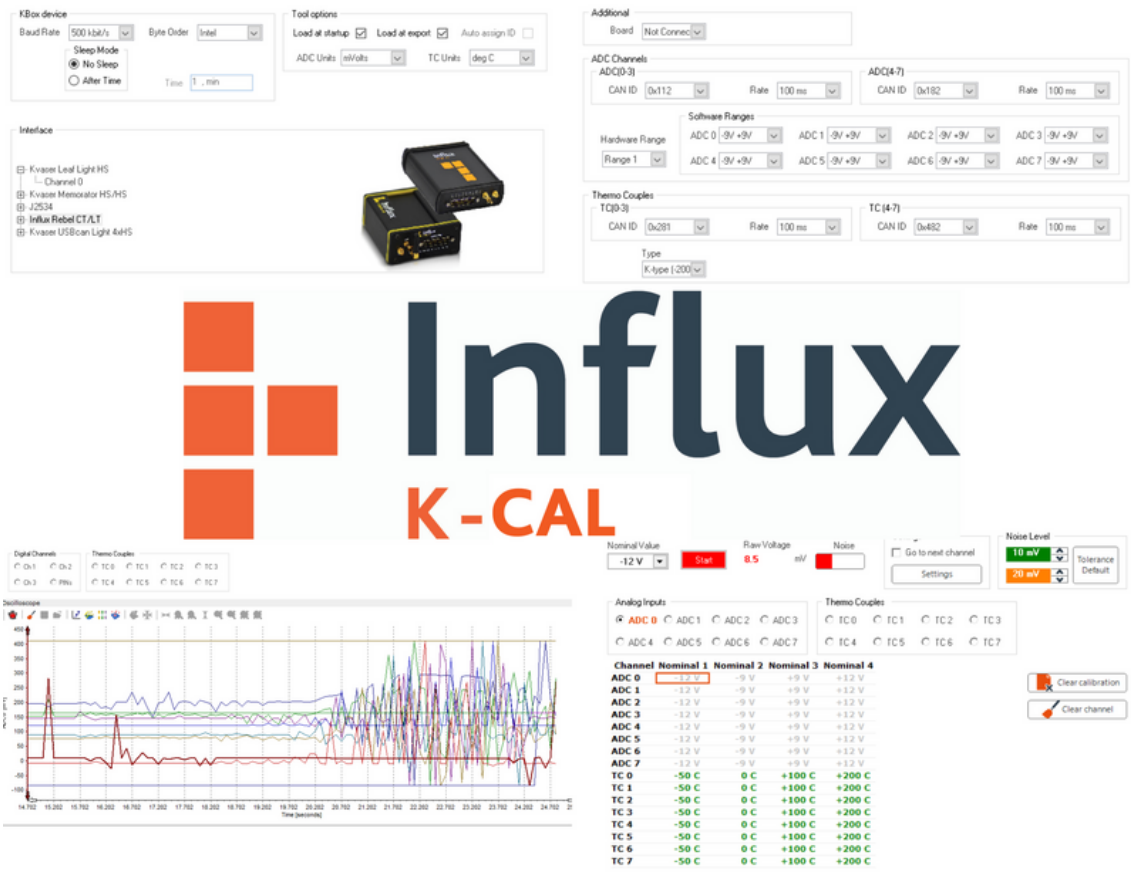
Influx TECHNOLOGY

User Guide

K_TC: User Manual & Quick Start Guide.



ABOUT THIS MANUAL

This document provides a brief idea of the usage, safety precautions, installation procedures and operation of the Influx K_TCxx. This document is intended for professional engineers and academic researchers, allowing them to understand the concept of operating the device and integrate this knowledge into systems with components of other manufacturers.

DISCLAIMER

Translation of the original K_TC: User Manual & Quick Start Guide.

Version	Date	Remarks
1.0	17-09-2021	Initial Version

Table 1: Version Details

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SUPPORT

If you have a problem that you cannot resolve on your own, feel free to contact us for assistance at support@influxtechnology.com

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1. Introduction

The K-TC is Influx's stackable instrumentation that is compatible with the Rebel range of data loggers. It can also be integrated with any device configured via DBC files, even other logger systems or output signals on CAN to the Rebel Dash display.

The K-TC is an ideal solution for applications that require a large number of thermocouple inputs. The K-TC's accurate sensor data is transmitted periodically on the CAN bus, enabling multiple devices to be connected. In addition, the K-TC CAN bus settings, calibration and sampling rates are all easily configurable, and these settings are stored within the K-TC even when the device is not powered.

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1.1 Technical Specifications

Function	Description
Power Supply	4.5 to 36V DC
Power Consumption	Normal operation 150mA to 350mA at 12 V
	Power down standby mode approx. 3mA at 12V
Configuration	Via CAN bus with K-Cal
	Output control settings and configuration stored in the device
Interfaces	CAN bus (max 1000kbps)
PC Interfaces	Powered by USB2.0 Type B (Isolated)
Enclosure	Dimension (LxHxW): 115x26(K-TC8), 46(K-TC16), 86(K-TC32)x 105mm
	Weight: 430g K-TC8), 570g(K-TC16), 900g(K-TC32)
	IP65
	ABS
Environmental	-40°C to +85°C
	Humidity Max 90%
Thermocouple Inputs	K,J, T - type
	±1°C accuracy
	Measurement: -200°C to +1200°C
Connection Types	Thermocouples mini K,J, T- type
Thermocouple inputs	
Number Of Channels	8xK,J,T –type input (K-TC8); 16xK,J,T –type input (K-TC16); 32xK,J,T –type input (K-TC32)
Measurement Range	-200°C to +1200°C
Max Sampling Rate	10 Hz per channel
Max voltage applied	±3.3V

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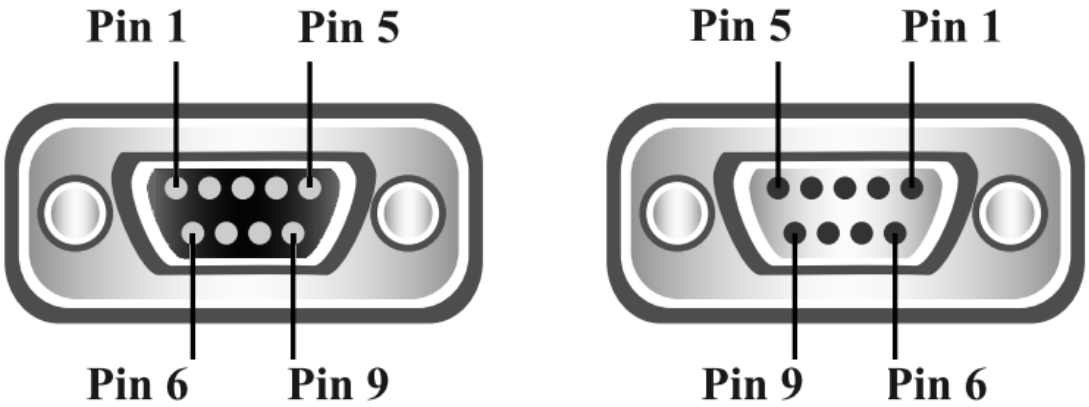
1.2 Pinout of the K-TCxx

- **2x DB9 CAN Connectors**

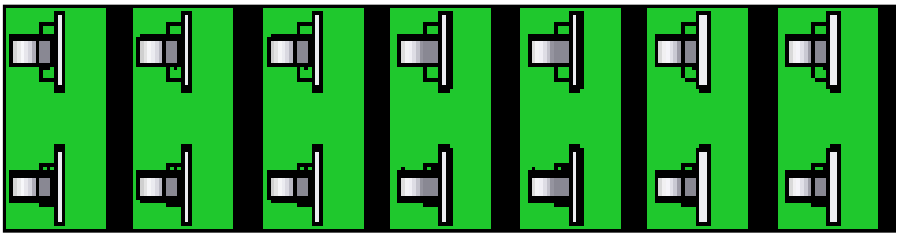
The CAN connectors are 1x Male and 1x Female 9 pin Subminiature D Type connectors.



DB9	Pin Function
Pin 2	CAN L
Pin 3	Ground
Pin 5	Power Ground
Pin 7	CAN H
Pin 9	Power Supply 4.5-36V

- **Thermocouple Connectors**

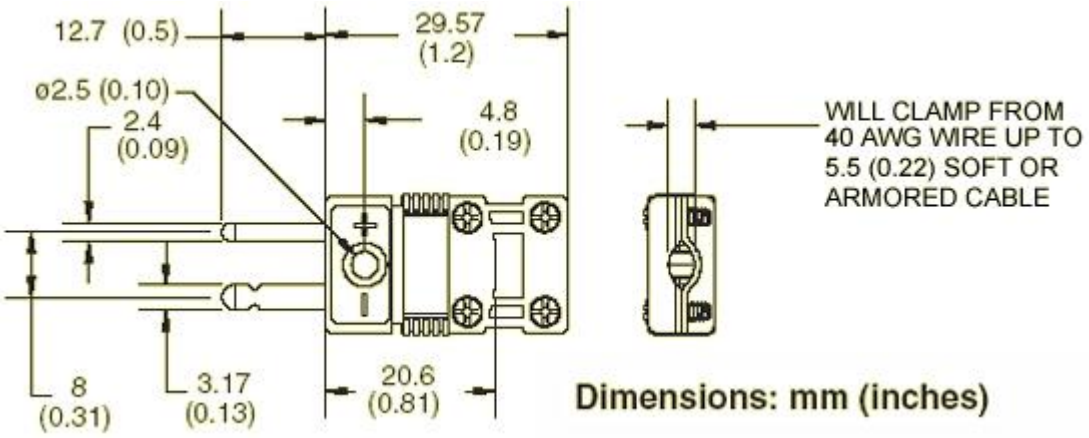
The Thermocouple connectors on the K-TC are miniature size flat type sockets.



IEC Connector	Pin Function
Top	+
Bottom	K

© Influx Technology.

The dimensions of the Male Flat Type Miniature Size Thermocouple Plug that you would plug into it is as follows:

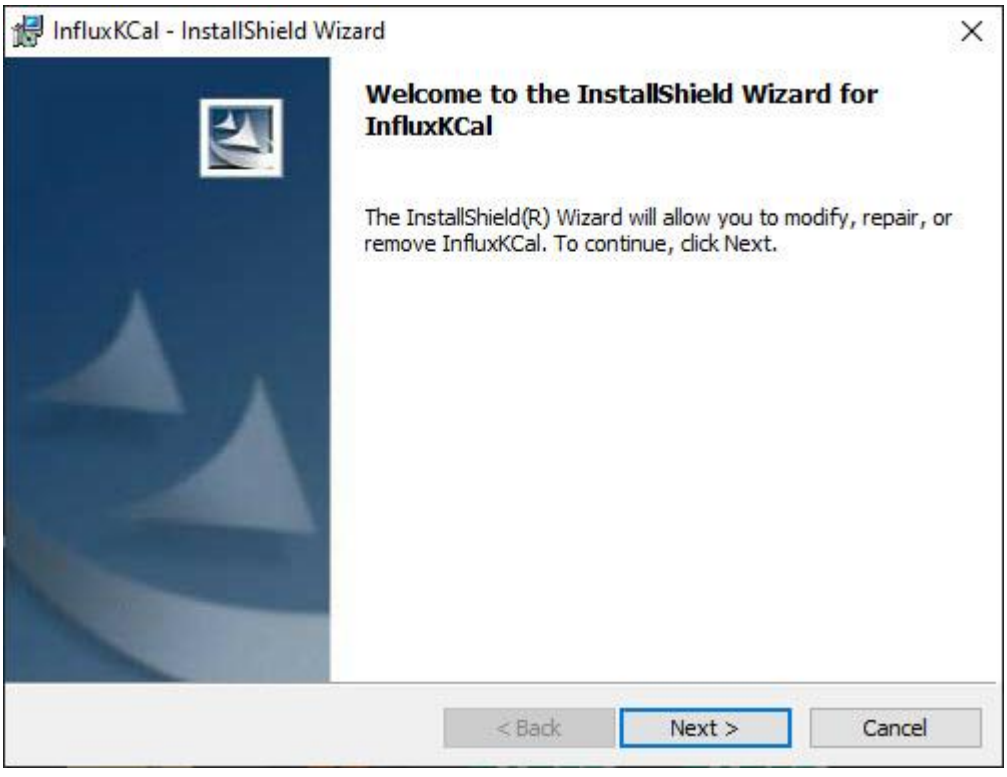


1.3 Software Installation

1.3.1. Installing the K-TCxx Cal Software:

Step 1
Run the K-TCxxCal.msi

Step 2
Click Next to start the installation



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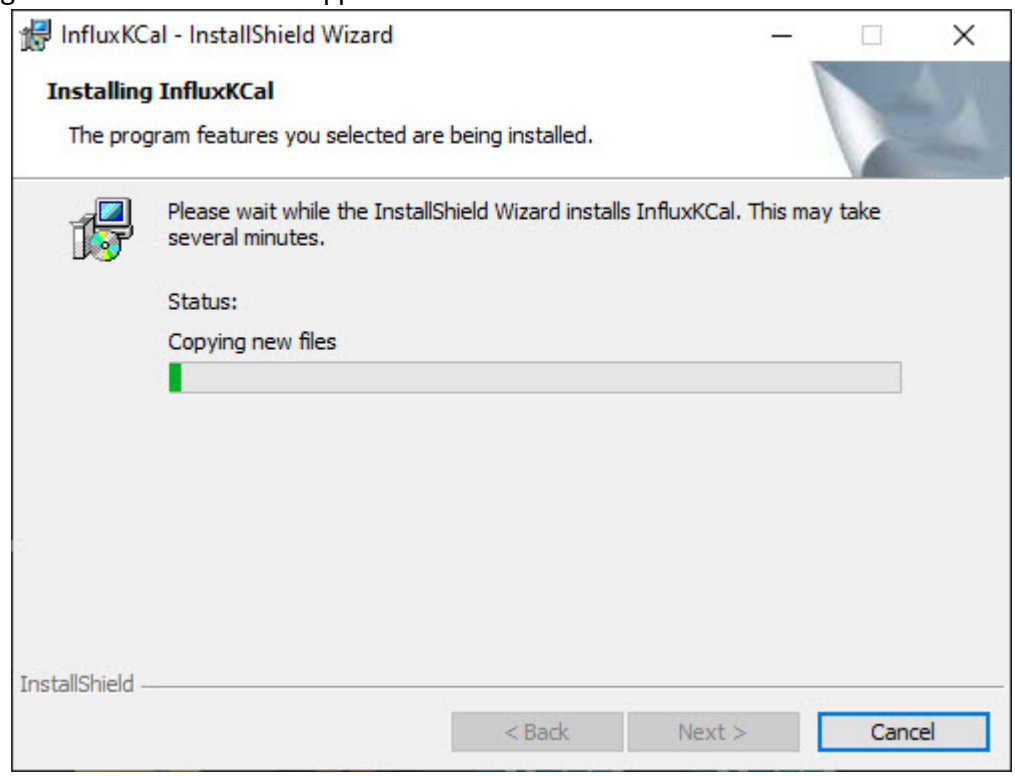
Step 3

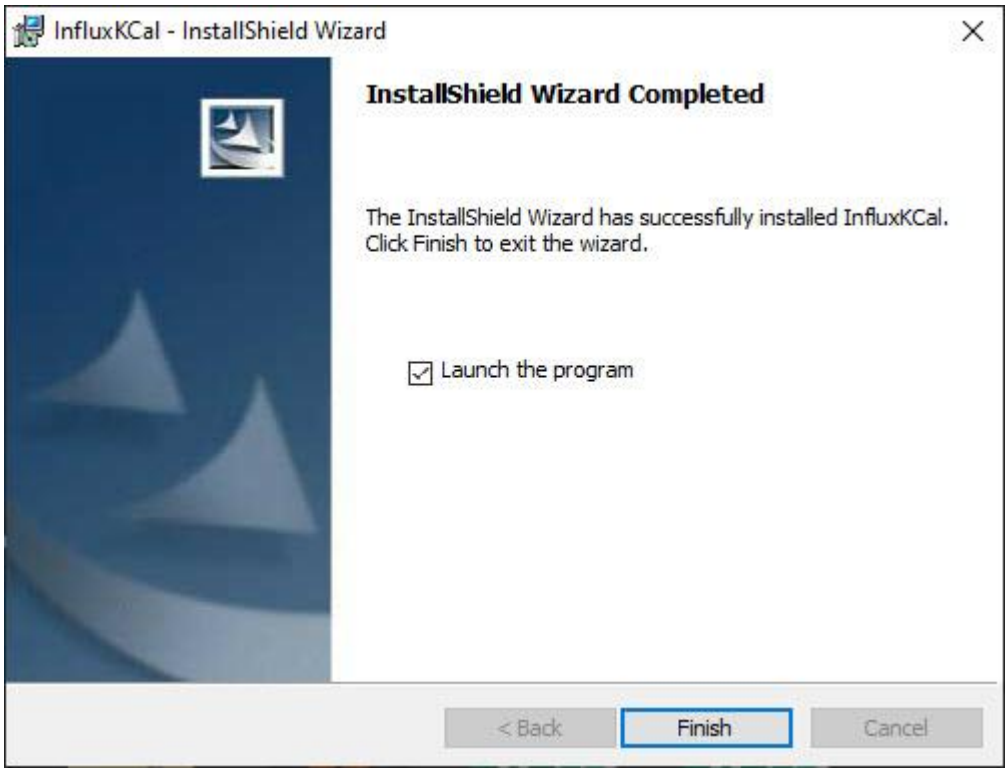
The program installation window appears



Click "Cancel" if you do not wish to install.

Step 4

After the K-TCxxCal software is installed, click finish



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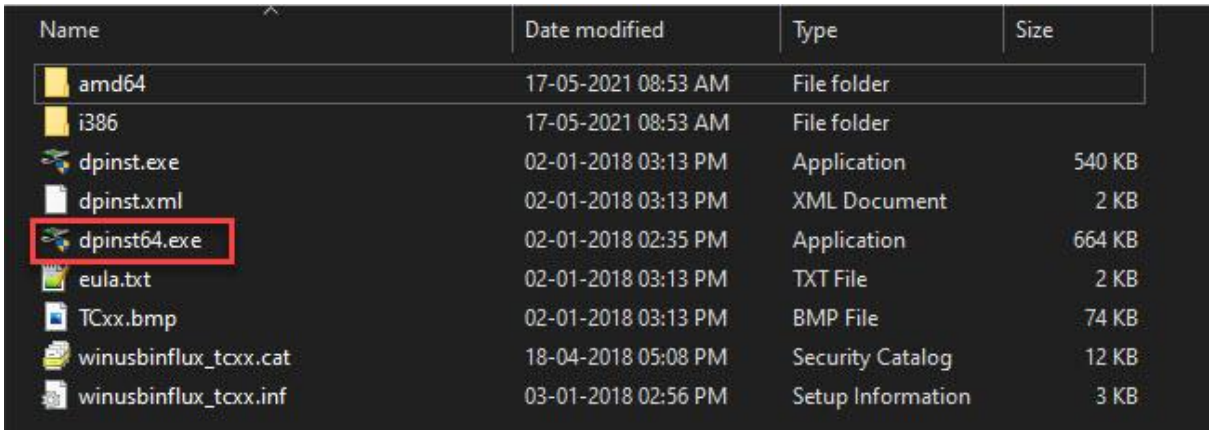
1.3.2. K-TCxx Driver installation:

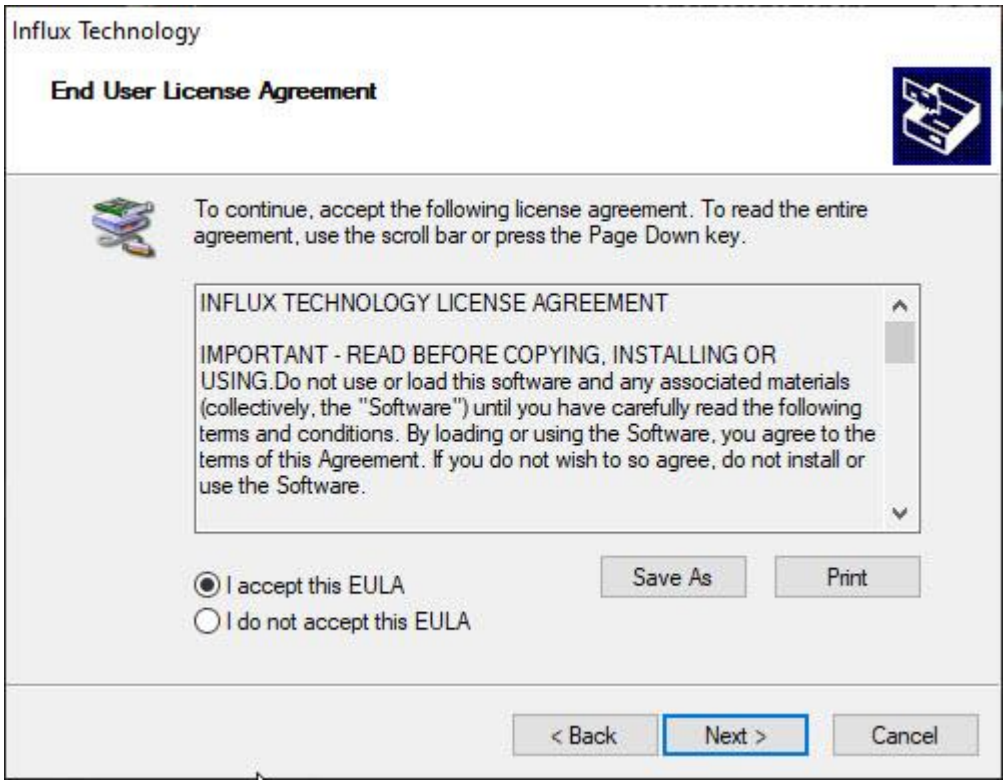
Before proceeding with the installation, please ensure that you have acquired administrative privileges.



To install the K-TCxx driver, run the .exe file in this location:
C:\Program Files (x86)\Influx Technology\Influx K-Cal\TCxxDriver

The .exe file can also be found in the start menu under 'influx technology.
Run the K-TCxx Installer.exe file.

To continue with the installation of the K-TCxx device driver on your system, click 'Next'.



To cancel the installation at this stage, click 'Cancel'. (No software has been installed on the system at this point.)

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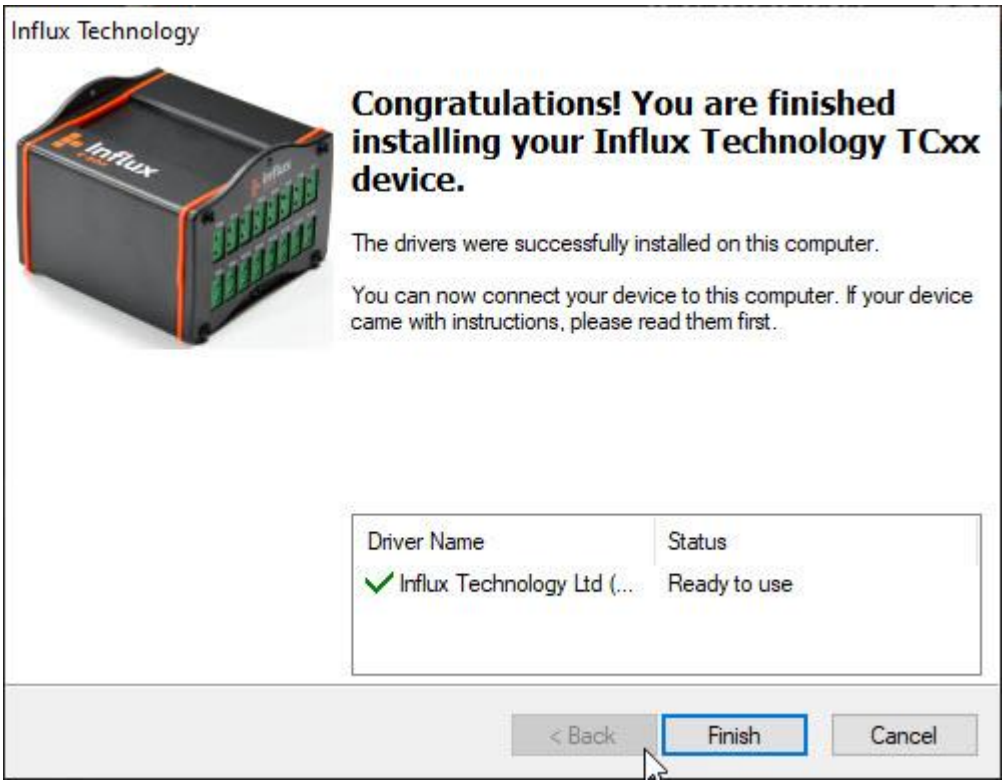
Please read the license agreement carefully.

Once you understand and accept the license agreement, please click 'I accept this EULA' to continue with the driver's installation. If you do not accept the terms, please click 'Cancel' to stop the installation at this point.

Click 'Next' to continue the installation process

Once the installation is complete, this window will appear.



Click 'Finish' to close the window. The K-TCxx driver is now successfully installed on your system.

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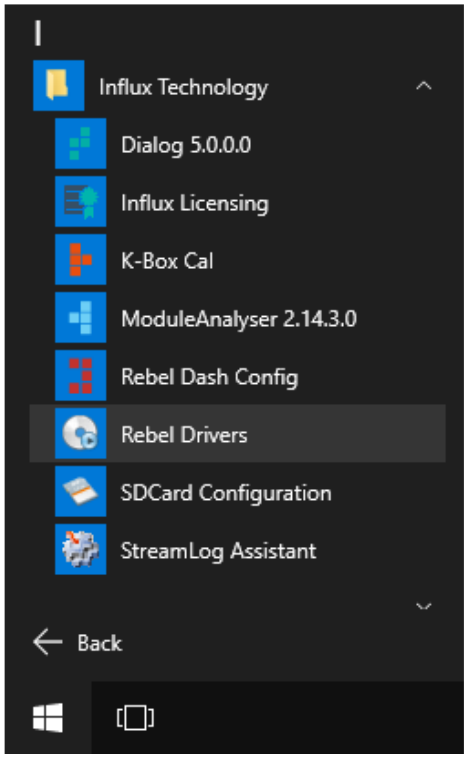
1.3.3. Installing the Rebel Drivers

The Rebel drivers must be correctly installed to ensure the Rebel functions correctly.

If DiaLog is installed, there will be a driver installation application available, which can be found in the Influx Technology folder of the Start Menu, as shown below.



Ensure the Rebel is not plugged in and click 'Next' to continue.

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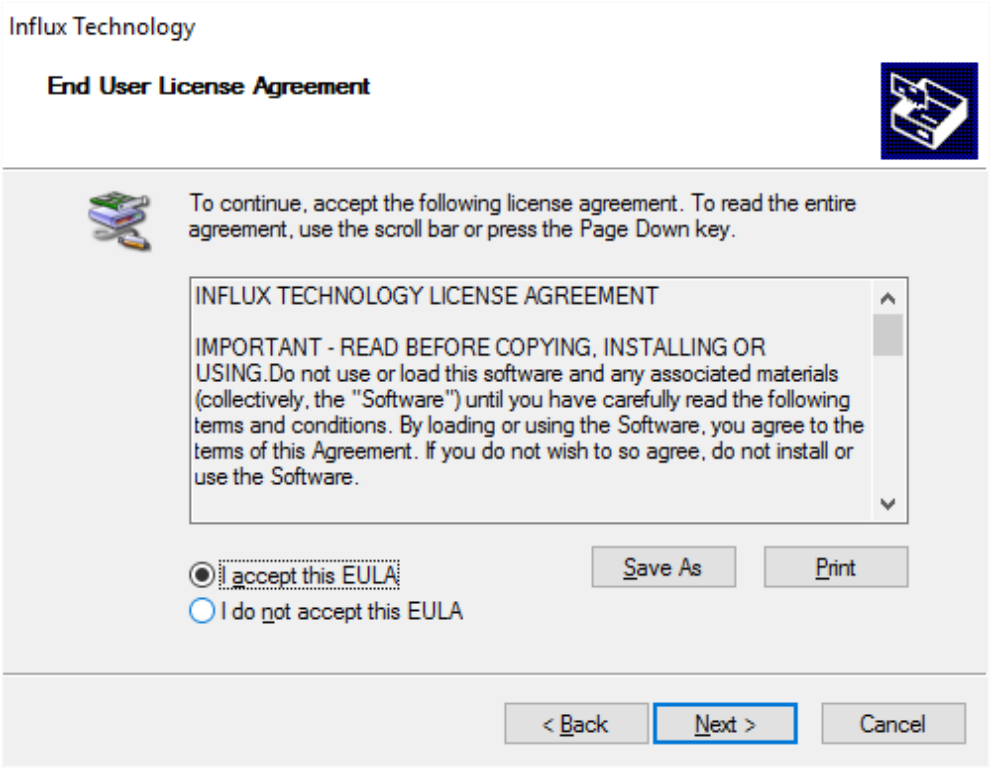
Please read and accept the EULA, then click next to continue.



The driver installation will begin and may take a few moments.
Once the installation is complete, click 'Finish' to close the application.

Plugin the Rebel to allow the drivers to be recognised.

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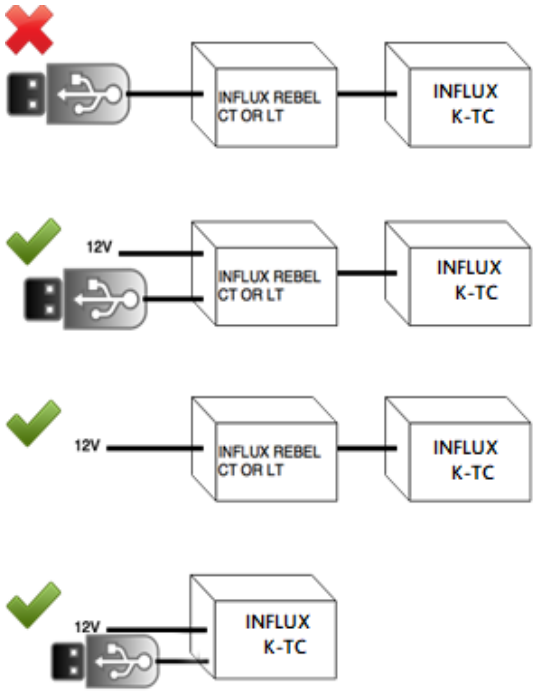
2. Connecting and powering the K-TCxx

The K-TCxx is powered via the CAN and power connectors and designed with CiA® 102 pinout for the CAN bus and power to connect the device as simple as possible.

Most commonly, it will be powered from a Rebel Logger using the Multi Connect Cable, but you can also power it via pin 9 (4.5 to 36V) and pin 5 PowerGND of the 9 pin Sub D connectors. If connected via the Multi connect cable, the CAN 1 (MS) bus is also connected to allow the Logger to record the data transmitted from the K-TCxx.



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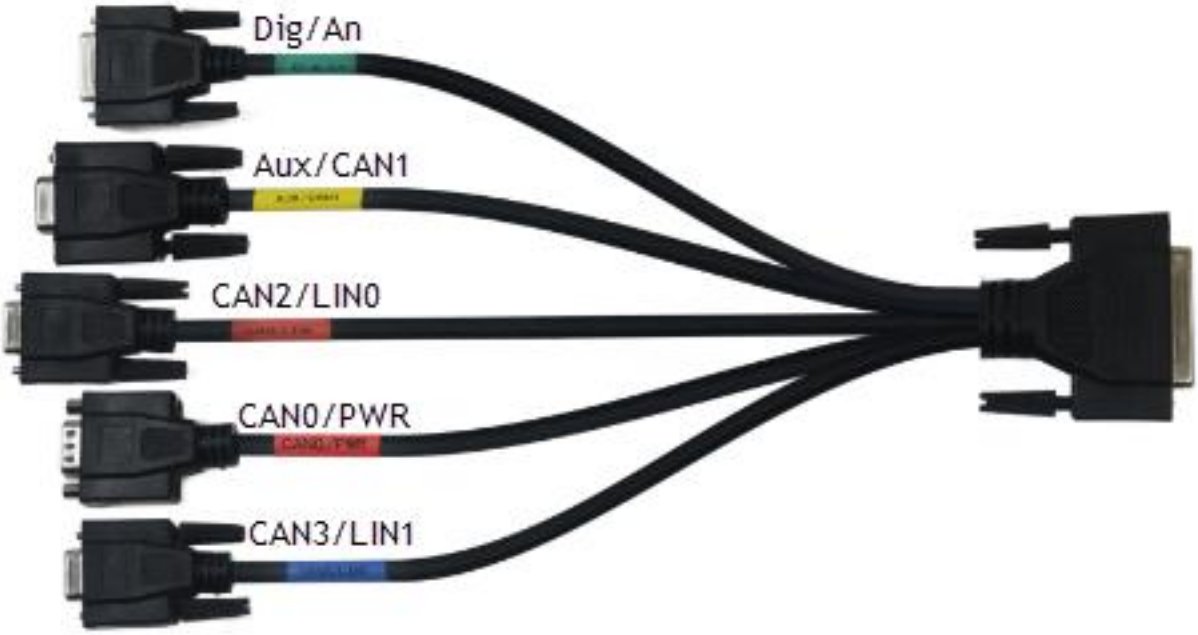
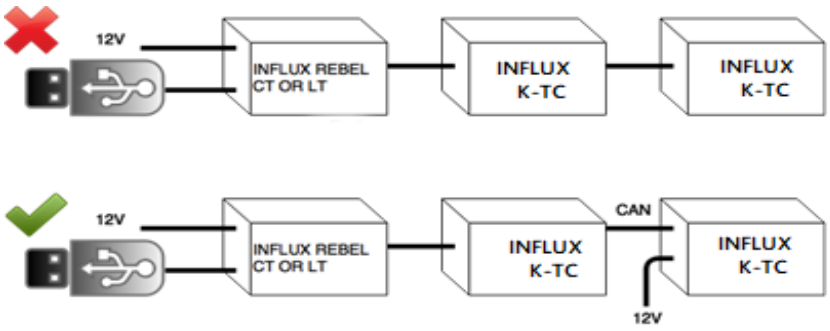
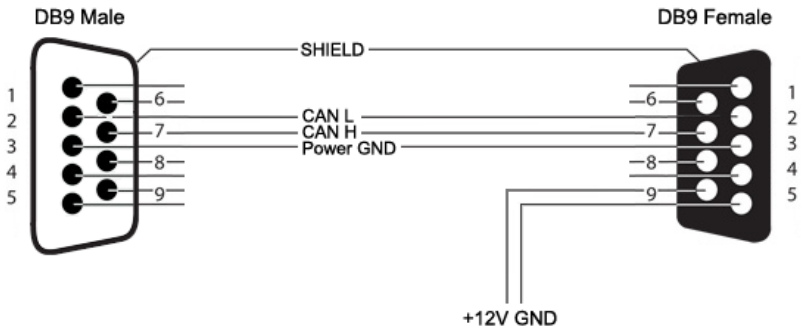


Warning

- Several K-TCxx can be daisy chained via the additional DB9 Connector, however, **they must have power supplied seperatly via power breakout in the cable**, not via the Logger, it can also be used to connect other devices such as the Rebel Dash.



The pinout of the required Cable between the two K-TCxx is as follows:



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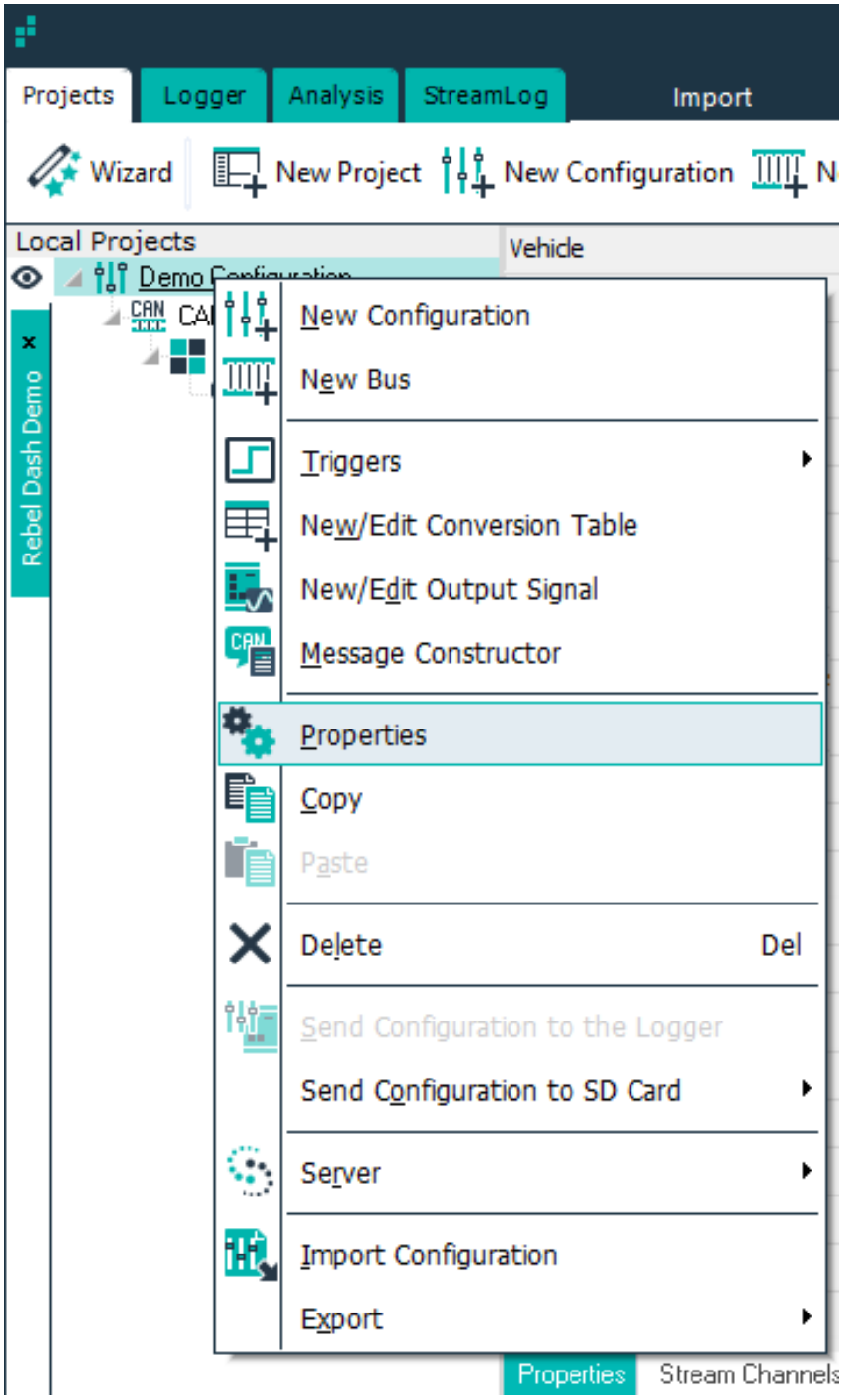
2.1 Enable the AUX Power setting within the Logger Configuration

If you power it from the Logger, the Logger will need to be powered from the vehicle or an external power source
(NOT just via USB) and you will need to make sure the AUX power feature in the configuration is set to on. To do this, follow the Steps Below:

Step 1
Right-click on the Project that you want to configure and select 'Properties'; if you need to create a configuration, this is detailed in the 'Loading the K-TCxx configuration into DiaLog' section document.



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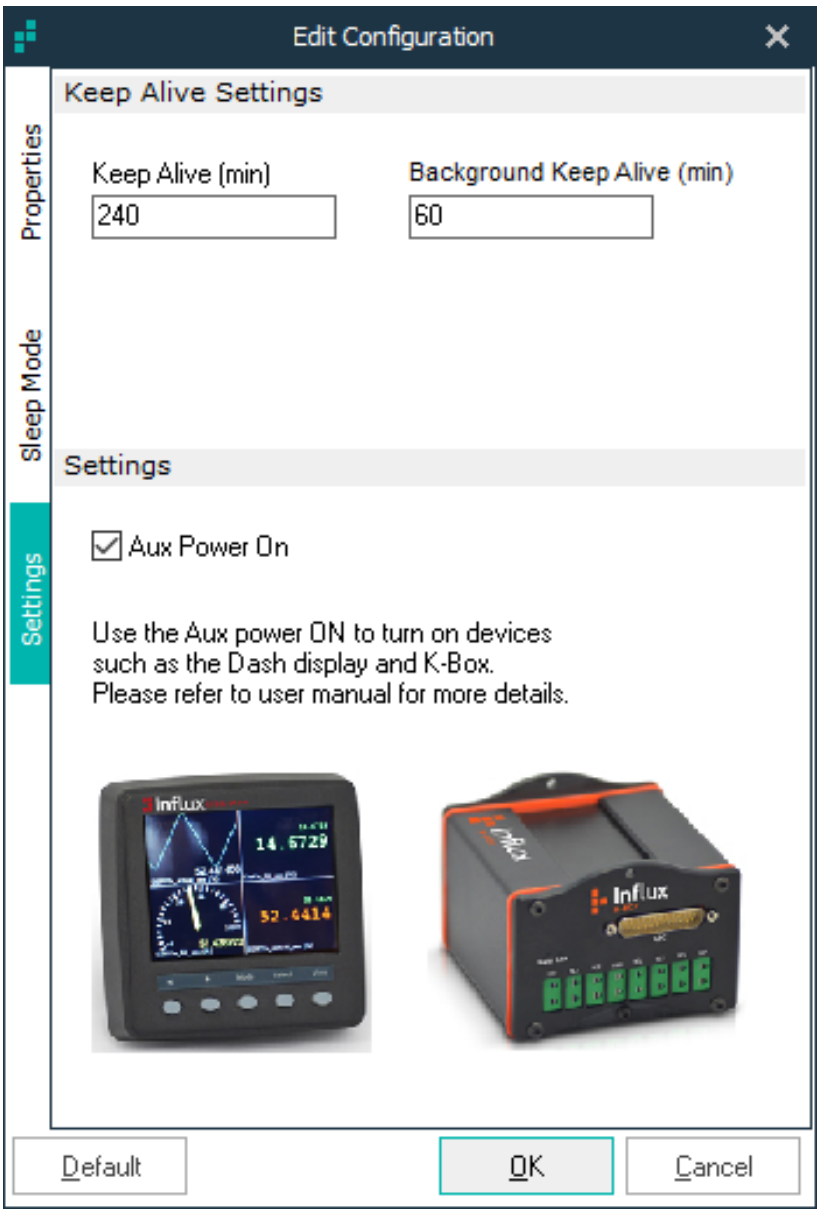
Step 2

Once the Edit Configuration window is displayed, click on the 'Settings' Tab and put a Checkmark in Aux Power On.



Step 3

Click OK to set the Aux Power on Setting in the Configuration…

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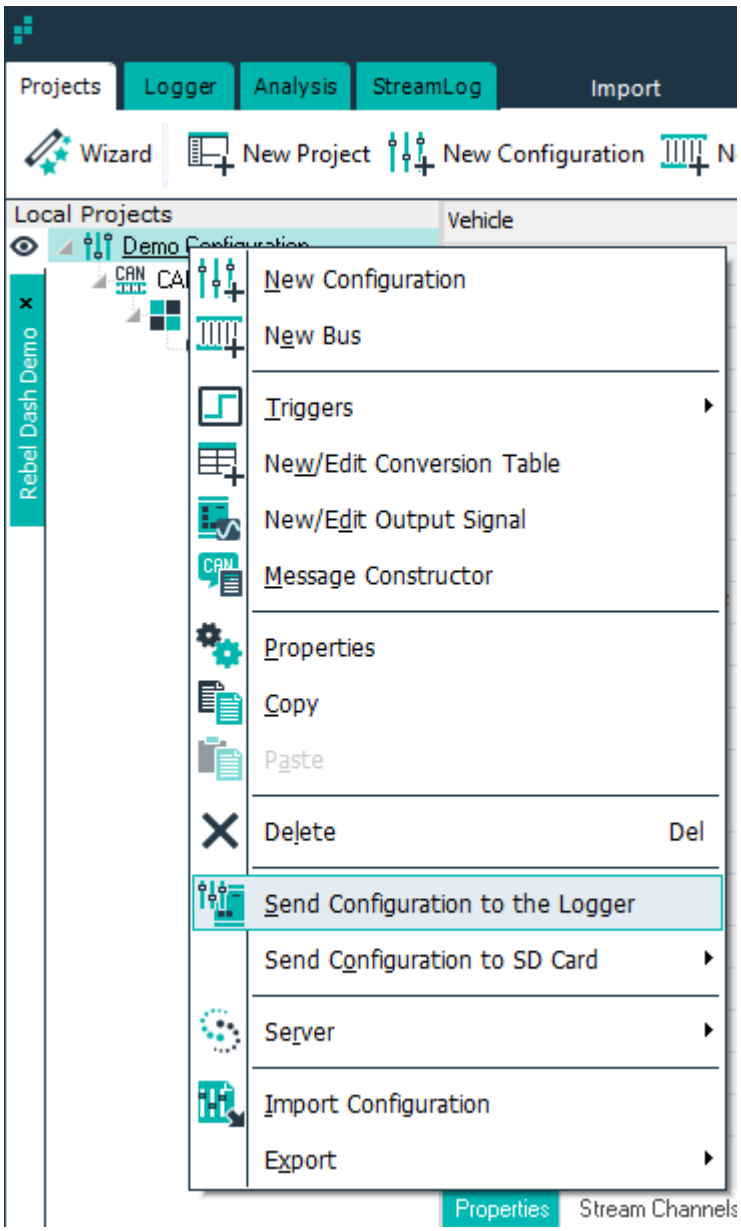
Step 4

Send the configuration to the Logger by right-clicking on the project and choosing "Send Configuration to the Logger."



If you have the CAN bus that the K-TCxx is connected to set to the right speed within your Project, you will see the Status Light on Solid Orange and the CAN Light on Solid Green; if it is flashing green, the CAN bus is misconfigured, check the speed and termination.

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3. Software Introduction

3.1 Graphical Overview

K-TC xx is accessed using either the desktop icon: or the 'Start Menu' directory—'Influx Technology'.
Once started, the user is presented with the following opening screen:

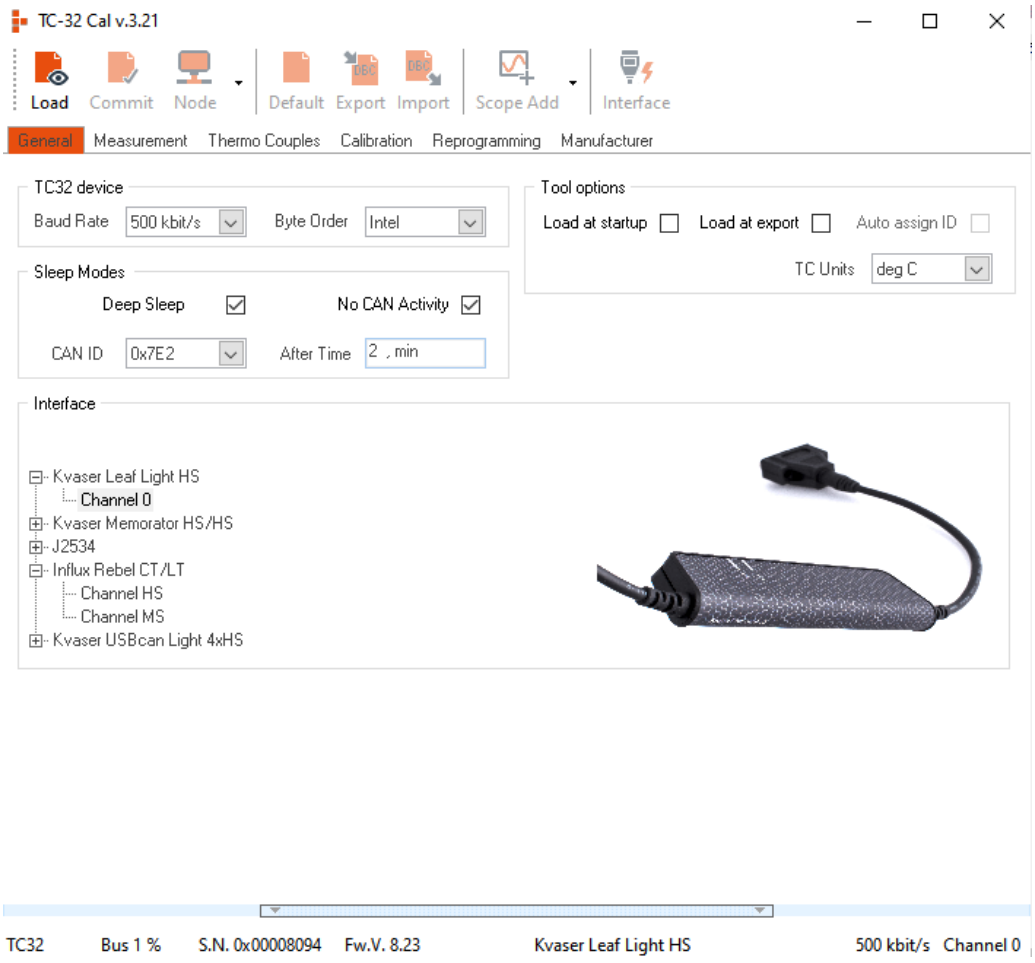
3.2 Interface Tab

The 'Interface Tab' is situated at the top of the software screen and can be used to navigate most program features. Some of the menus will be active only when a logger is interfaced.

- **General** – This allows the user to configure the interface and sleep settings.
- **Measurement** – This allows the user to visualise the thermocouple data on the oscilloscope.
- **Thermo Couples** – This allows the user to configure the thermocouple sampling rates and CAN IDs.
- **Calibration** – This allows the user to calibrate the thermocouple inputs.
- **Reprogramming** – This allows the user to re-programme the TC module.
- **Manufacturer**- This allows the user to review the manufacturer information.

3.2.1 General Tab

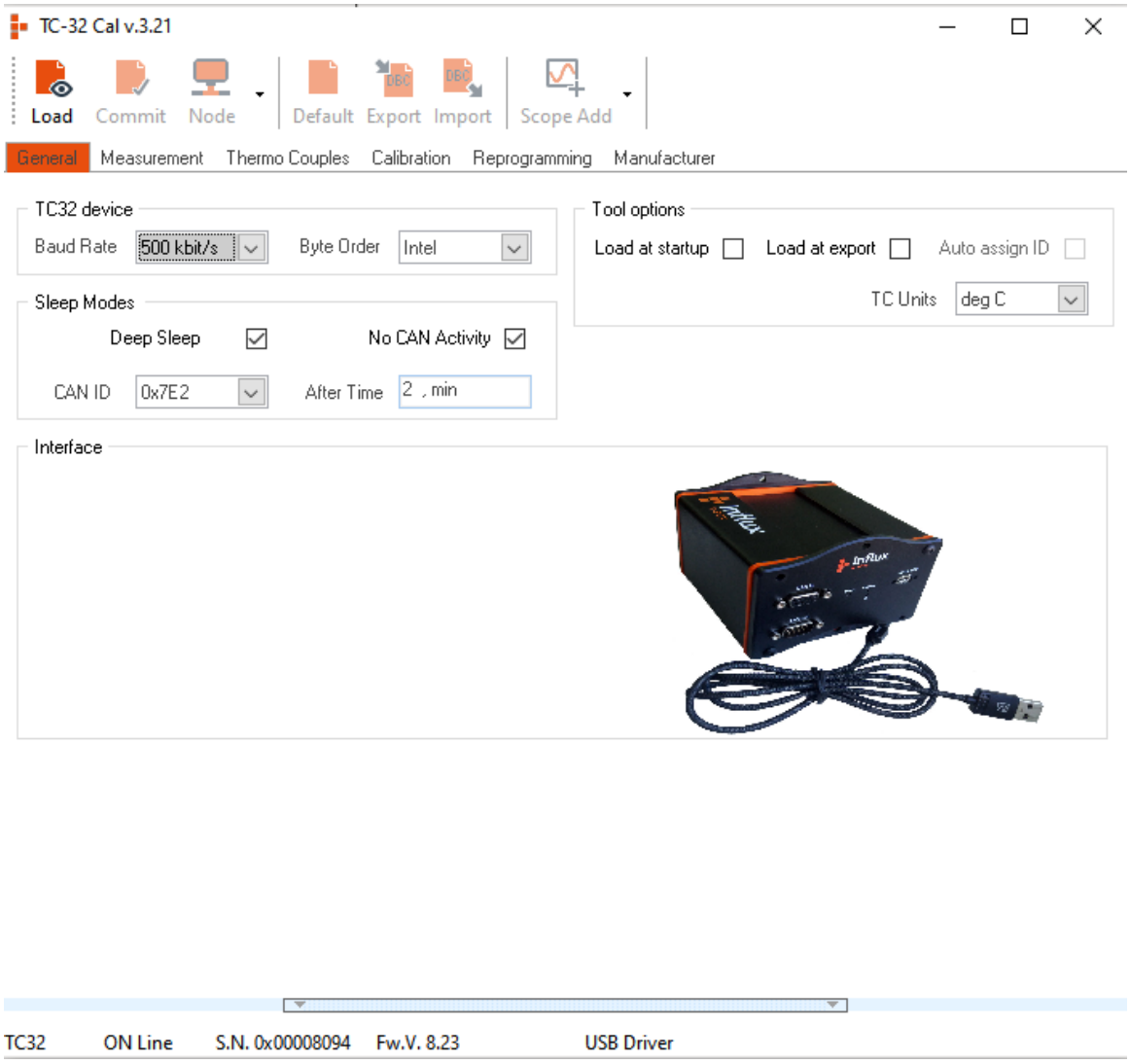
User can find all the settings related to the CAN Bus interface, Sleep and Software option in this Tab.



© Influx Technology.

Pressing the Load Button Loads the settings contained in the K-TCxx and displays them on the screen.

CAN Settings	**Baud rate**	Allows the user to choose CAN Baud Rate for the Unit
	Byte order	Allows the user to Change Byte order (Intel/Motorola)
Sleep Mode	**Deep Sleep**	Enables the low power consuming Deep Sleep
	No CAN Activity	Enables sleep function if there is not CAN activity
	CAN ID	CAN ID used for Sleep Command
	After Time	Sleep delay time
Tool Options	**Load at Startup**	Enabling this automatically loads the previous settings
	Load at Export	Enabling this automatically loads the previous settings
	Auto assign ID	Enables Automatic assigning of CAN ID to signals to avoid duplicates, use when multiple devices are configured simultaneously.
	TC unit	Allows the user to specify the unit to be used deg C or deg F



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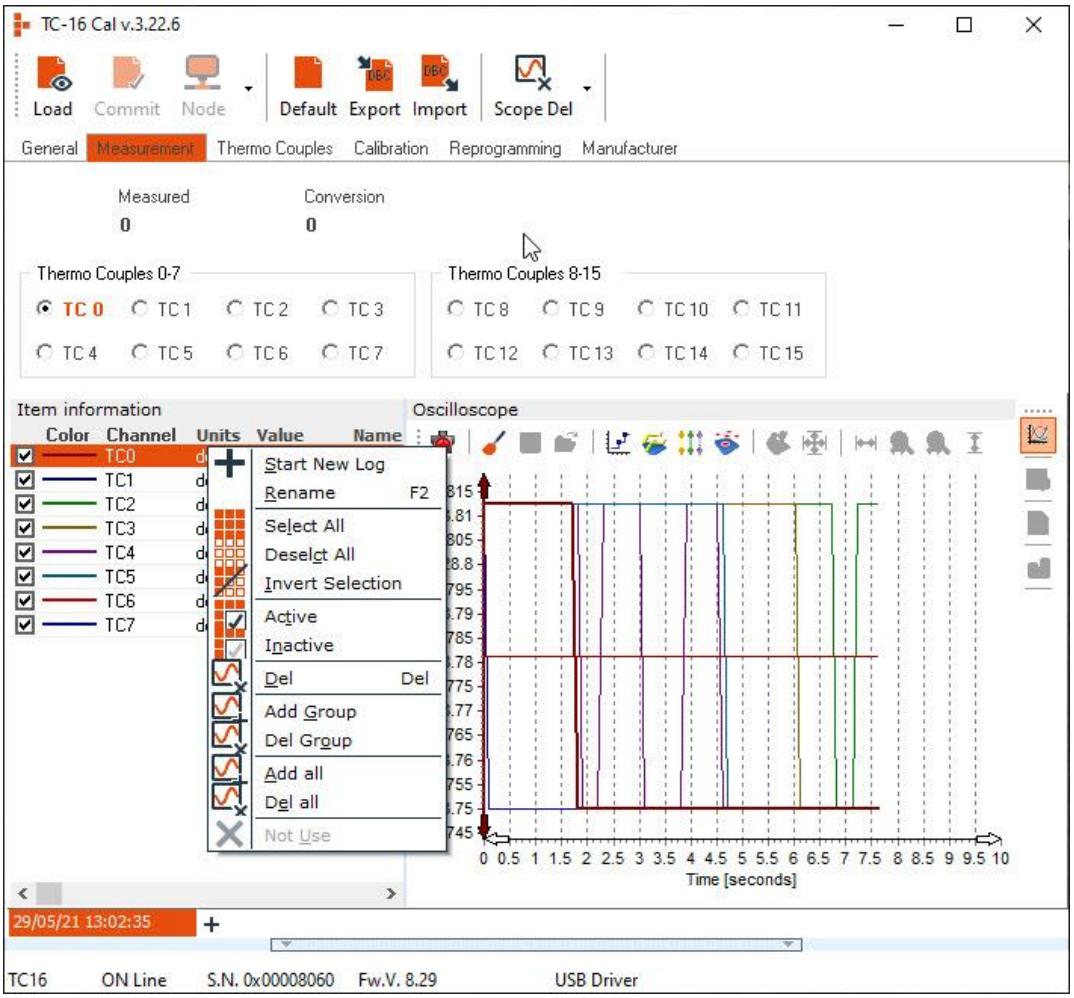
3.2.2 Measurement Tab

This Tab allows the user to visualize the live measurements.



Pressing the Load Button Loads the settings contained in the K-TCxx and displays them on the screen.

Pressing the Default Button will reset all the settings.

Pressing the Export button will open the DBC export window.

Pressing the Import button will load the settings from the DBC file.

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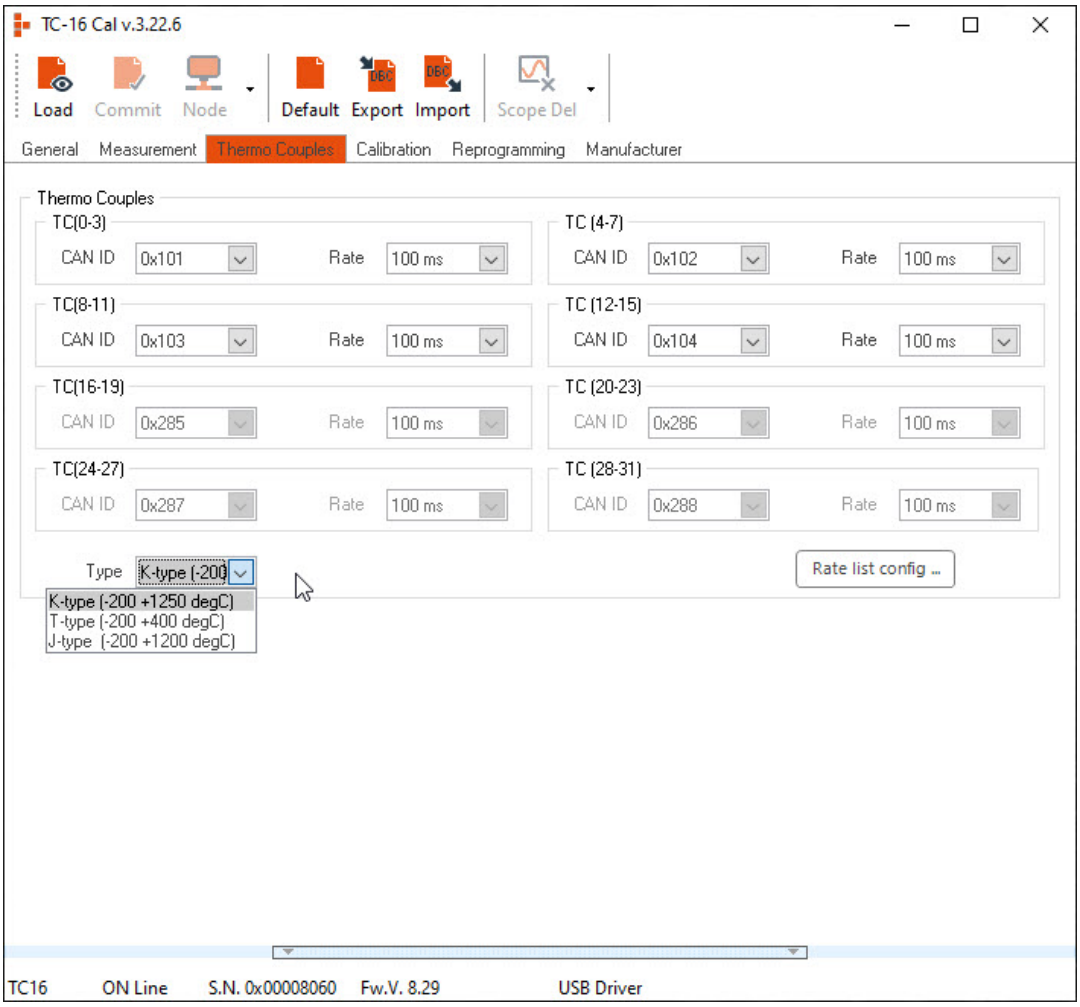
3.2.3 Thermo Couples Tab

User can configure the CAN ID, Transmission rate and type of thermocouple in this window.



Pressing the Load Button Loads the settings contained in the K-TCxx and displays them on the screen.

CAN ID User can use this option to set the CAN ID of the messages containing thermocouple data

Rate Allows the user to set the CAN message transmission rate.

Type Allows the user to select the thermocouple type.

Rate List Config Allows the user to add additional transmission rates.

Pressing the Default Button will reset all the settings.

Pressing DBC Export will open the DBC export window.

Pressing the Import button will load the settings from the DBC file.

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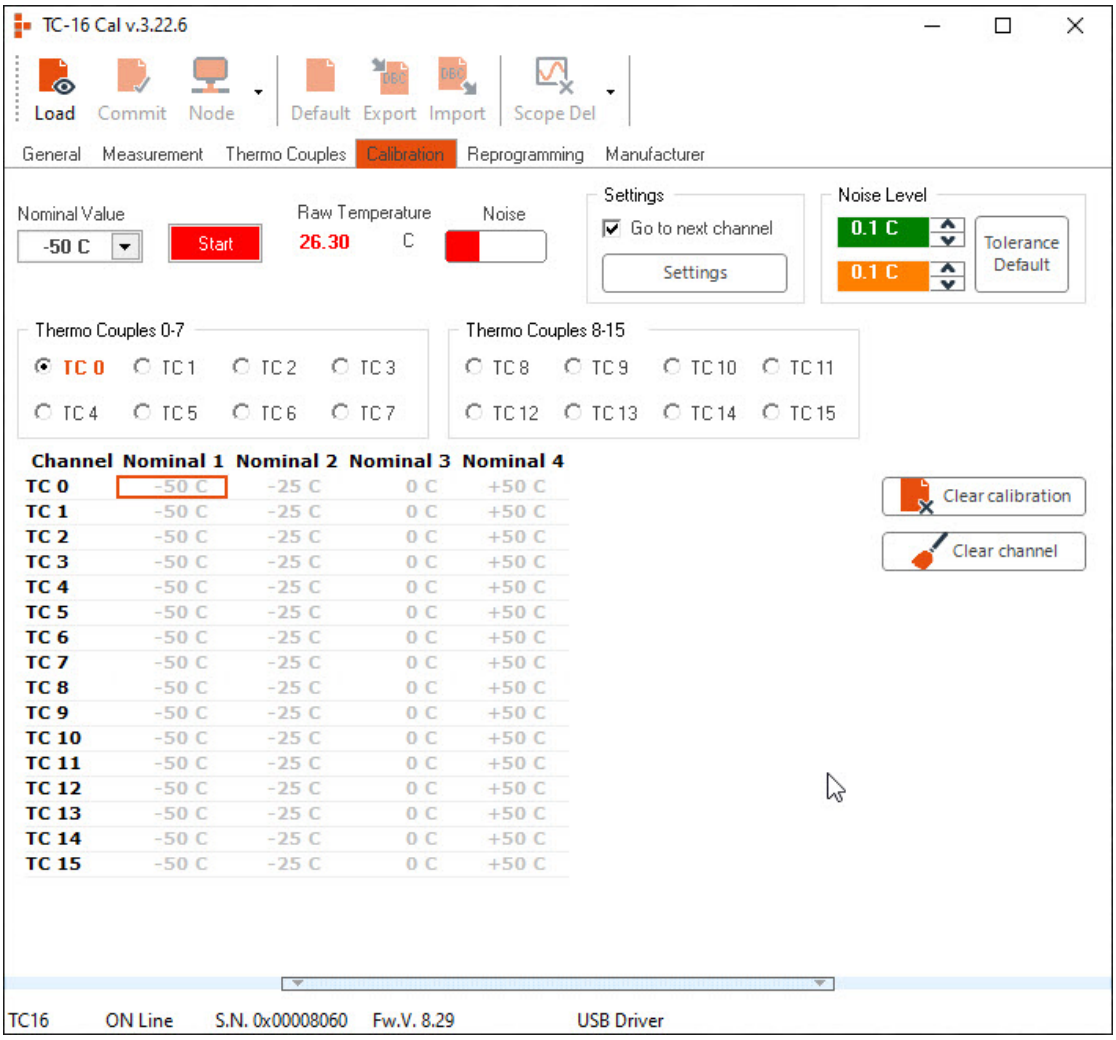
3.2.4 Calibration

You can calibrate the K-TCxx to Improve the Accuracy of the measurements. The software allows you to cycle through a number of measurement points; once done, the calibration will apply the calibration to the K-TCxx, and measurement accuracy will be improved.



 Load	Pressing the Load Button Loads the calibration contained in the K-TCxx and displays them on the screen. You may use this function if you wish to check that the K-TCxx is calibrated
Nominal Value	Allows the user to select the value which Is being fed to the thermocouple channel.
Raw Temperature	Displays the RAW temperature data.
Noise	Displays the noise level in the signal.
Settings	Allows the user to set the Nominal temperature values.
Noise Level	Allows the user to set the tolerance level.
Clear calibration	Clears the existing calibration in the device.
Clear channel	Clears the calibration for the particular channel.

Alternatively, press the start button and attach the appropriate thermocouple test signals to the inputs of the K-TCxx to cycle through the test points to calibrate the K-TCxx for maximum accuracy:

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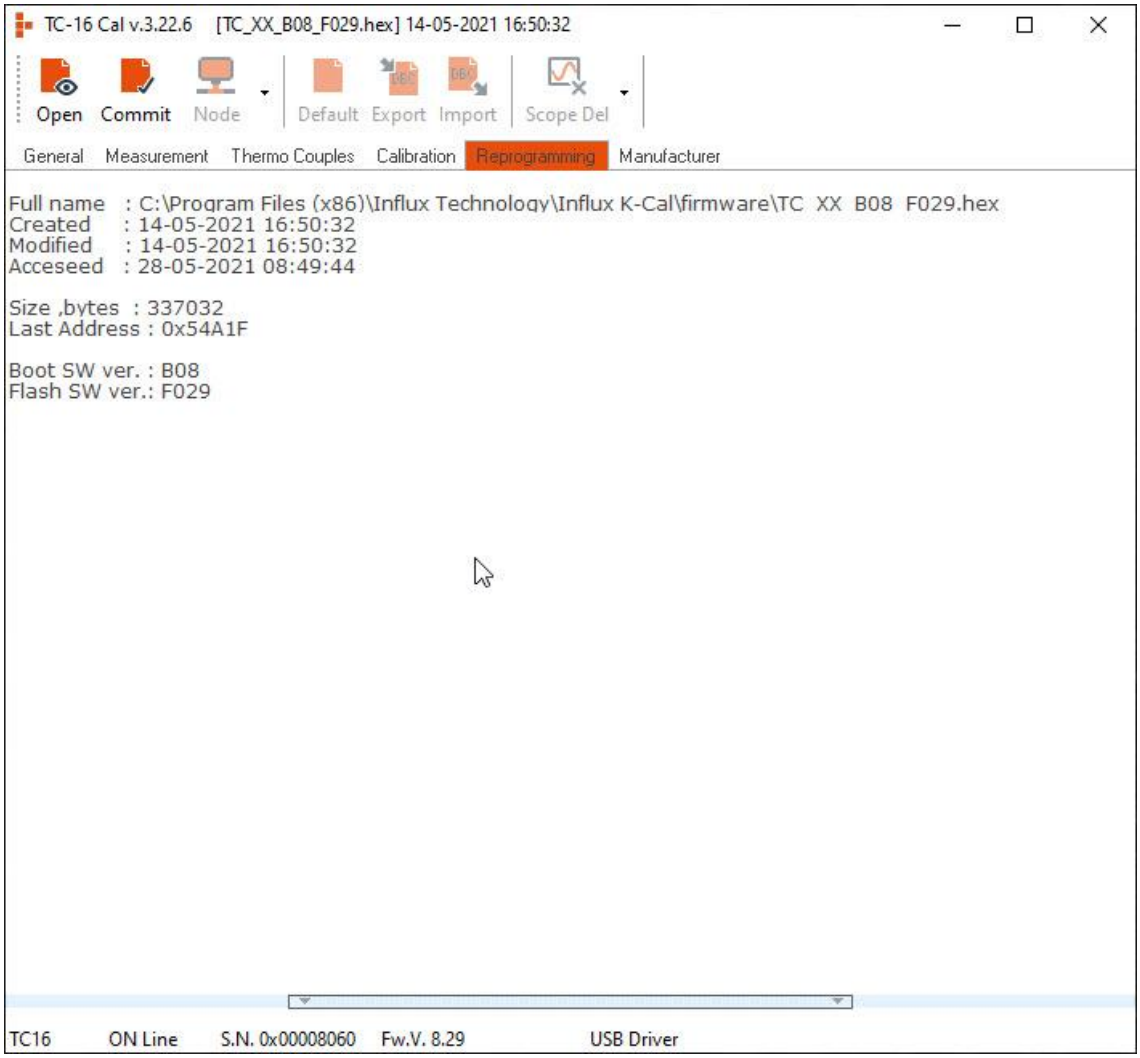
3.2.5 Reprogramming




Open

Allows the user to browse and select the firmware file.


Commit

Pressing Commit will start the Reprogramming process.

Notes

- Do not disconnect or power cycle the device during the process.

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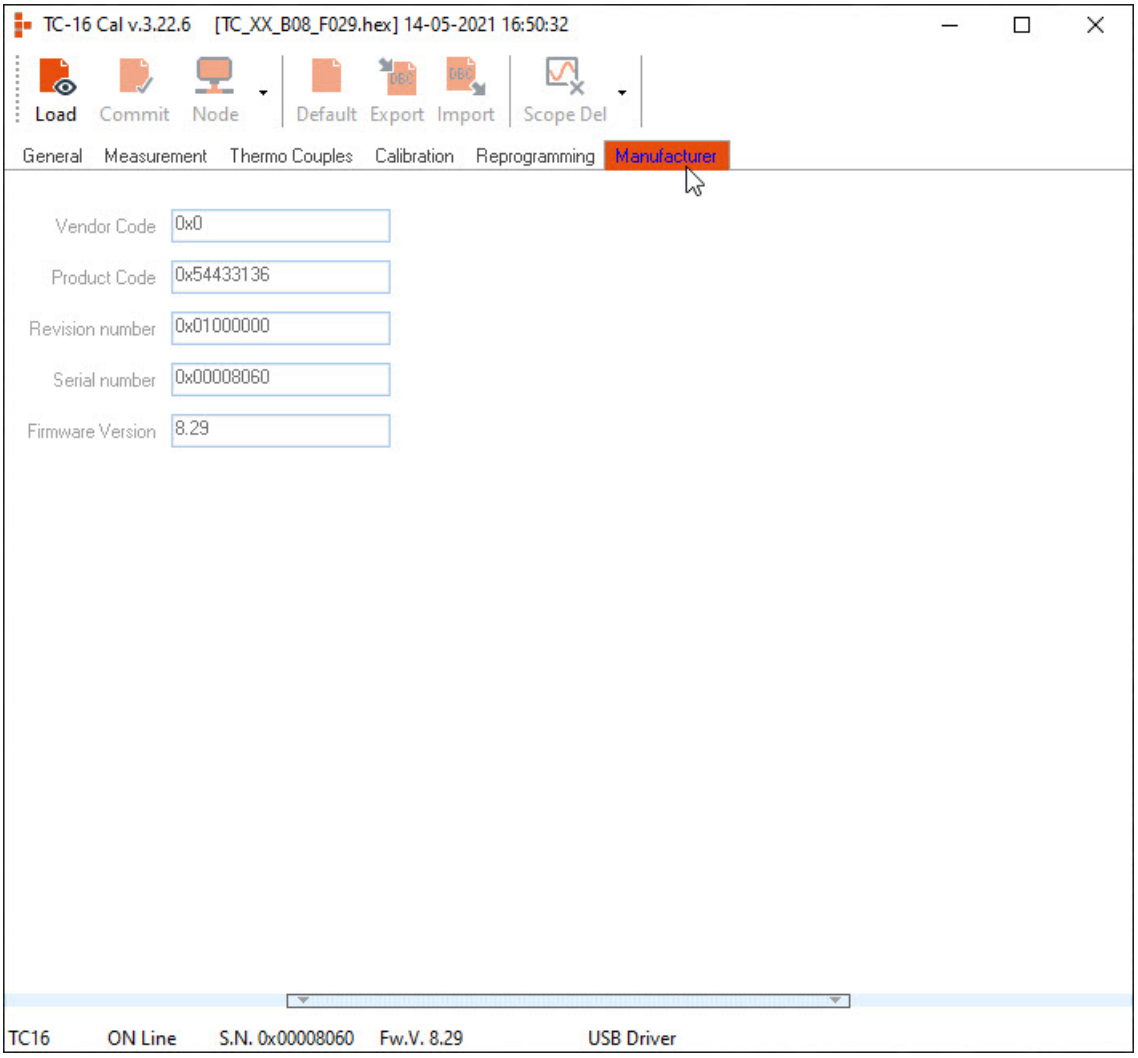
3.2.6 Manufacturer



Pressing the Load Button Loads the settings contained in the K-TCxx and displays them on the screen.

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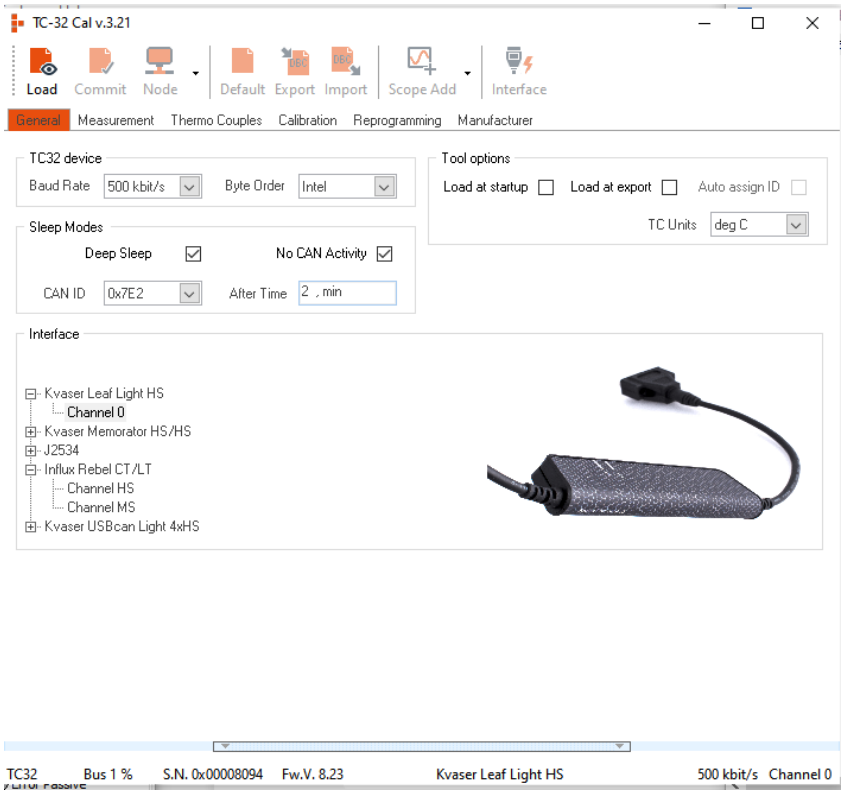
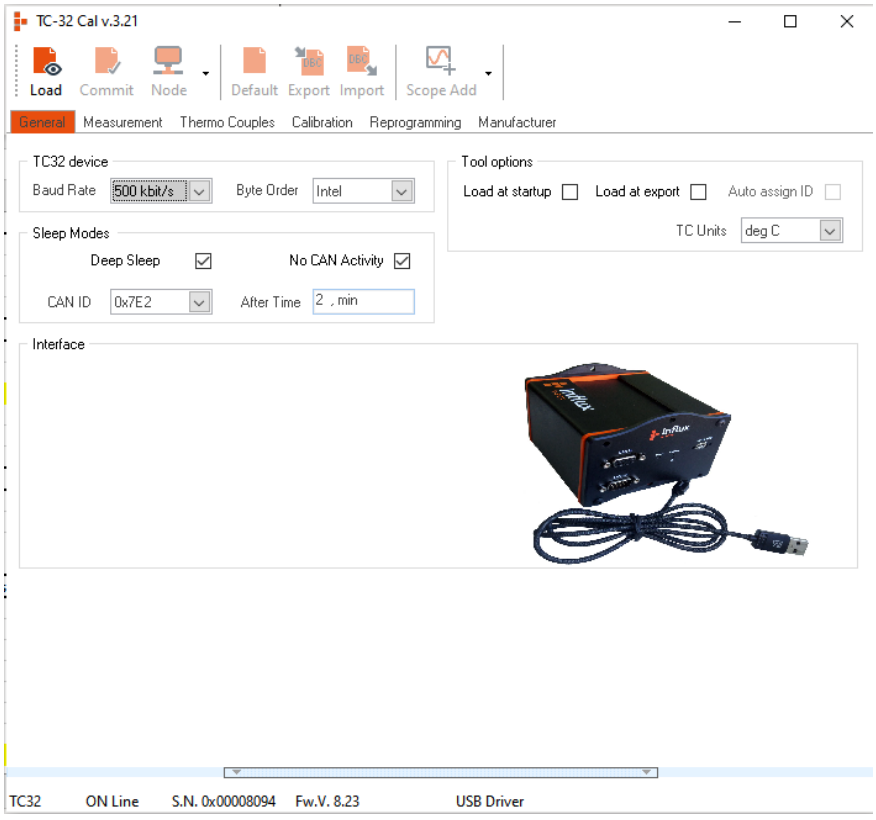
4. Using the K-TCxx Cal Software

Once you launch the K-TCxx Configuration utility, you will see the settings for the Interface you are using. If the K-TCxx is on and connected, its serial no and firmware version will be displayed at the bottom of the screen.



If the device is not interfaced, choose the interface device and click Baud Rate Scan.



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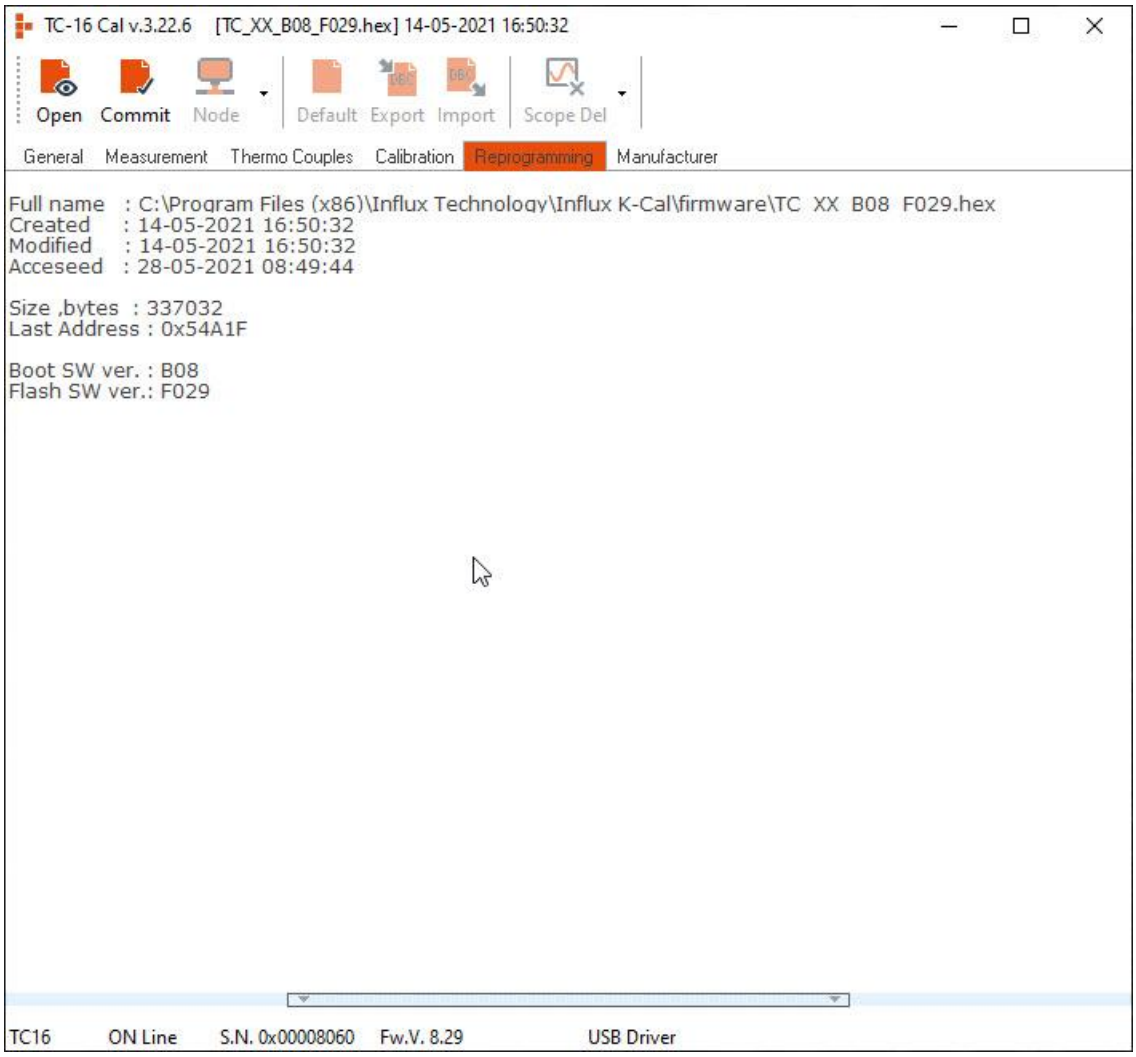
4.1. Reprogramming the K-TCxx

You can change to the Reprogramming Function by clicking the Tab; you will see the following Window



Step 1


Click the Open Button

Open

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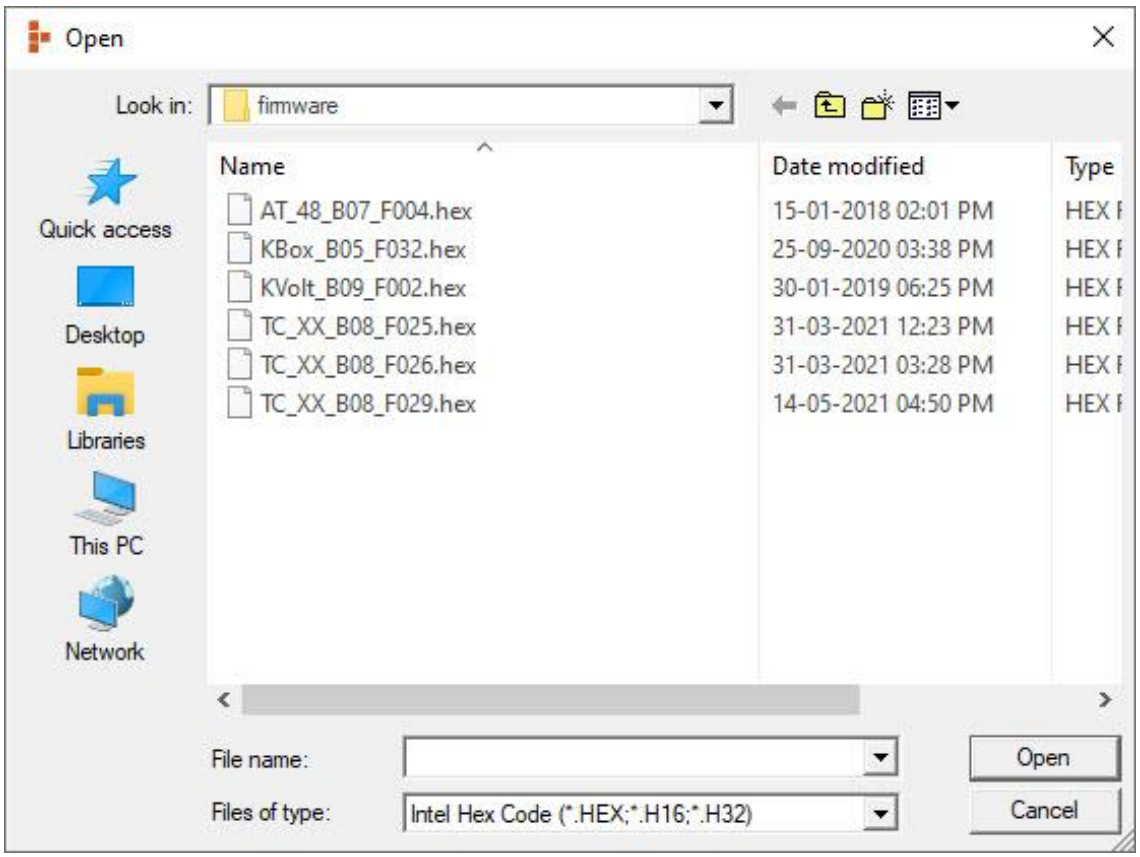
Step 2

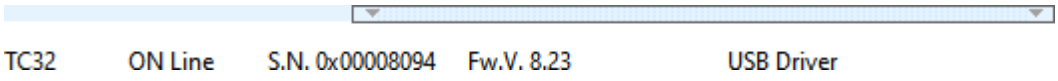
Locate the hex file that you wish to program into the K-TCxx. Usually, this will be located in C:\Program Files (x86)\Influx Technology\K-TCxx Config\firmware.



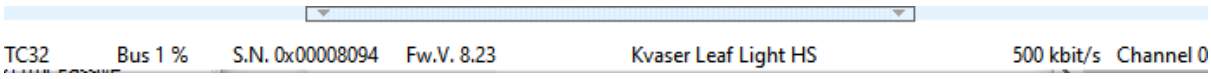
Then click the Open Button

Step 3

Click the Commit button; you will see the following progress indicator at the bottom of the screen:



OR



When the progress indicator reaches the right-hand side, reprogramming is complete.

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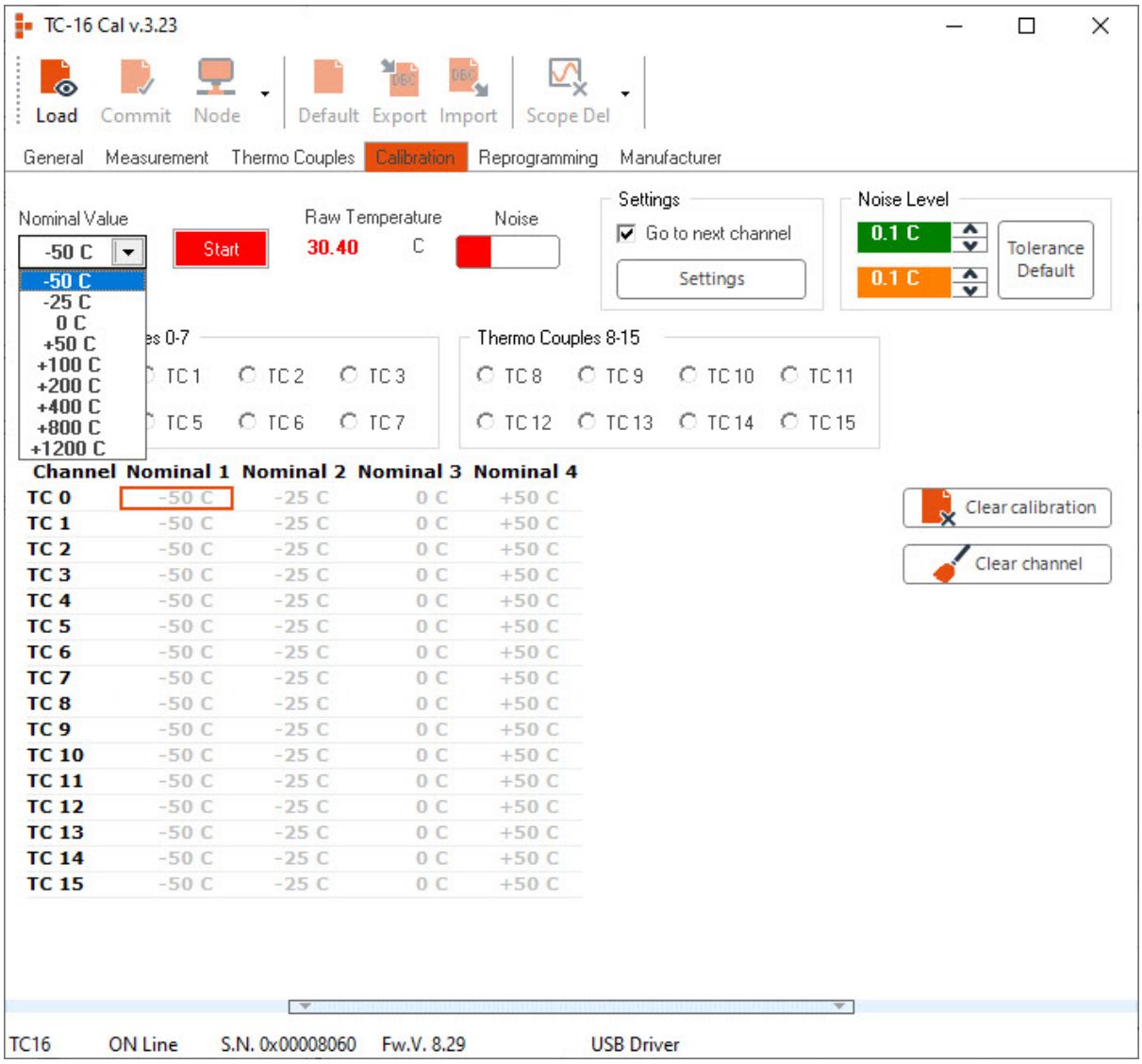
4.2. Calibrating the K-TCxx

You can calibrate the K-TCxx to Improve the Accuracy of the measurements. The software allows you to cycle through a number of measurement points. Once done, committing the calibration will apply the calibration to the K-TCxx, and measurement accuracy will be improved.



Pressing the Load Button Loads the calibration contained in the K-TCxx and displays them on the screen.
You may use this function if you wish to check that the K-TCxx is calibrated

Alternatively, press the start button and attach the appropriate thermocouple test signals to the inputs of the K-TCxx in order to cycle through the test points in order to calibrate the K-TCxx for maximum accuracy:

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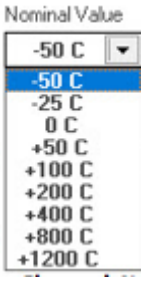
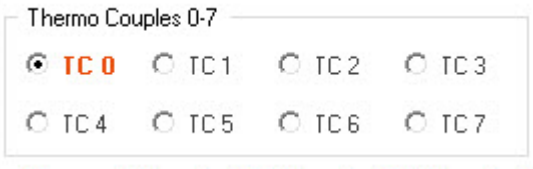
Step 1



Select the Calibration Point you wish to calibrate and make these points appropriate to your expected range of inputs.

Step 2

Select the Channel of the Calibration Point you wish to calibrate by either clicking the Radio Button of the channel



Channel	Nominal 1	Nominal 2	Nominal 3	Nominal 4
TC 0	-50 C	-25 C	0 C	+50 C
TC 1	-50 C	-25 C	0 C	+50 C
TC 2	-50 C	-25 C	0 C	+50 C
TC 3	-50 C	-25 C	0 C	+50 C
TC 4	-50 C	-25 C	0 C	+50 C
TC 5	-50 C	-25 C	0 C	+50 C
TC 6	-50 C	-25 C	0 C	+50 C

Or by clicking on the point, you wish to calibrate in the field to the right

Step 3

Adjust the input temperature from the calibrated test equipment that you are using to match the voltage for the test point:

Step 4

Press the Start button:

If the input temperature is stable and correct, the calibration of the channel will be updated as follows:

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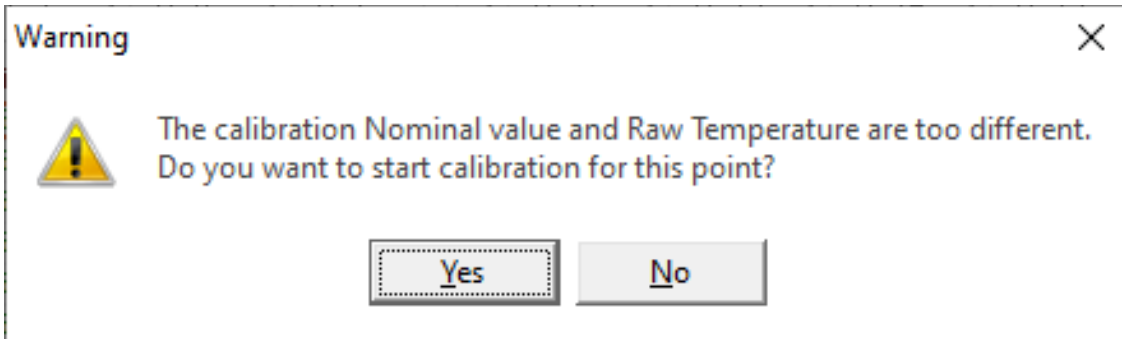
Channel	Nominal 1
TC 0	-50 C
TC 1	-50 C
TC 2	-50 C
TC 3	-50 C
TC 4	-50 C
TC 5	-50 C

If it is not, you will receive a warning:



Step 5

Repeat the steps above until you have calibrated all the calibration points.

Step 6

Once you have configured the K-TCxx as desired, click Commit to send the configuration to the K-TCxx. If you make a mistake and wish to clear the calibration, you can also use the Clear button

This will save the calibration to the K-TCxx and create a report detailing the calibration:

```
            K-Box Calibration report
            Report number: 7

Serial Number     : 0x00008094
Revision Number   :
Firmware Version  : 8.23
Date / Time       : 18-04-2021 / 00:37:23


            Calibration data


            Thermo Couples

Tolerance [deg C] : Med < 0.1   Low < 0.1

Ch   Nominal [deg C] Measured [deg C] Noise [deg C]   Nominal [deg C] Measured [deg C] Noise [deg C]
---- --------------- ---------------- --------------- --------------- ---------------- ---------------
TC0              -50 -49.625          0.03125     Low             -25 -24.5            0.09375     Low
TC1              -50 -49.5625         0.078125    Low             -25 -24.828125       0.0625      Low
TC2              -50 -50.171875       0.078125    Low             -25 -24.84375        0.078125    Low
TC3              -50 -50.140625       0.046875    Low             -25 -25.0625         0.03125     Low
TC4              -50 -50.046875       0.09375     Low             -25 -25.0625         0.046875    Low
TC5              -50 -50.28125        0.03125     Low             -25 -25.25           0.0625      Low
TC6              -50 -50.421875       0.0625      Low             -25 -25.3125         0.078125    Low
```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4.3. Erasing the Calibration

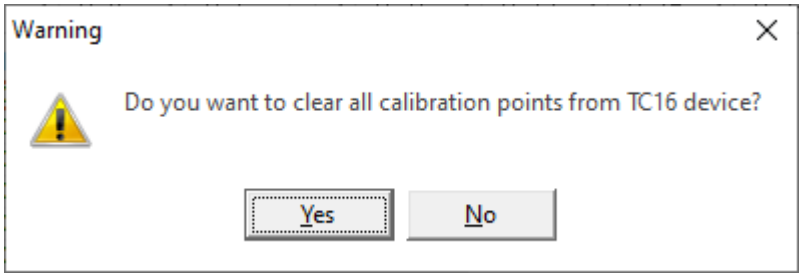
To erase the calibration, simply follow the following steps:

Step 1

Click the Clear Button:

Step 2

Click 'Yes' to confirm that you want to clear the calibration

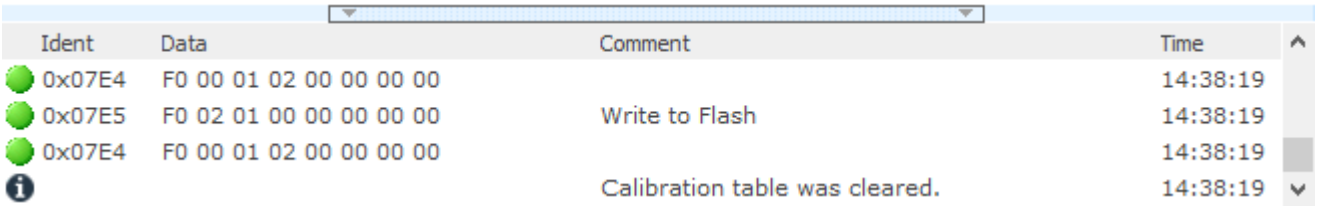


Step 3

Check that you can see the status messages at the bottom of the K-TCxx Cal Application; if you can't click on the light blue line and drag it upwards

Step 4

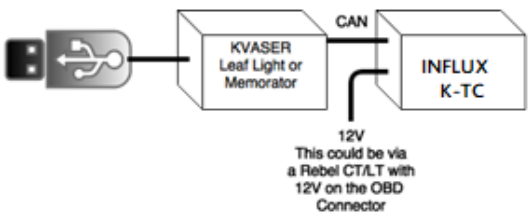
Wait until the status messages at the bottom of the window show that the Calibration table has been cleared:



Ident	Data	Comment	Time
0x07E4	F0 00 01 02 00 00 00 00		14:38:19
0x07E5	F0 02 01 00 00 00 00 00	Write to Flash	14:38:19
0x07E4	F0 00 01 02 00 00 00 00		14:38:19
		Calibration table was cleared.	14:38:19

4.4. Configuring the K-TCxx

The K-TCxx comes pre-configured, but the configuration is programmable using the K-TCxx Calibration utility. It requires a Kavser Leaf Light, Memorator or an Influx Rebel CT or LT to be installed and the K-TCxx Calibration utility.



For the above example, please install the Kvaser Drivers

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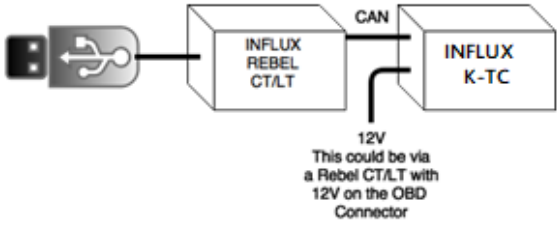
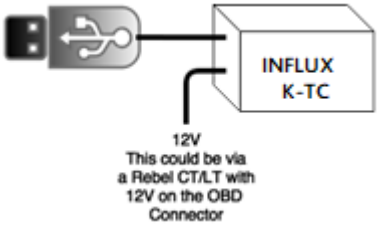


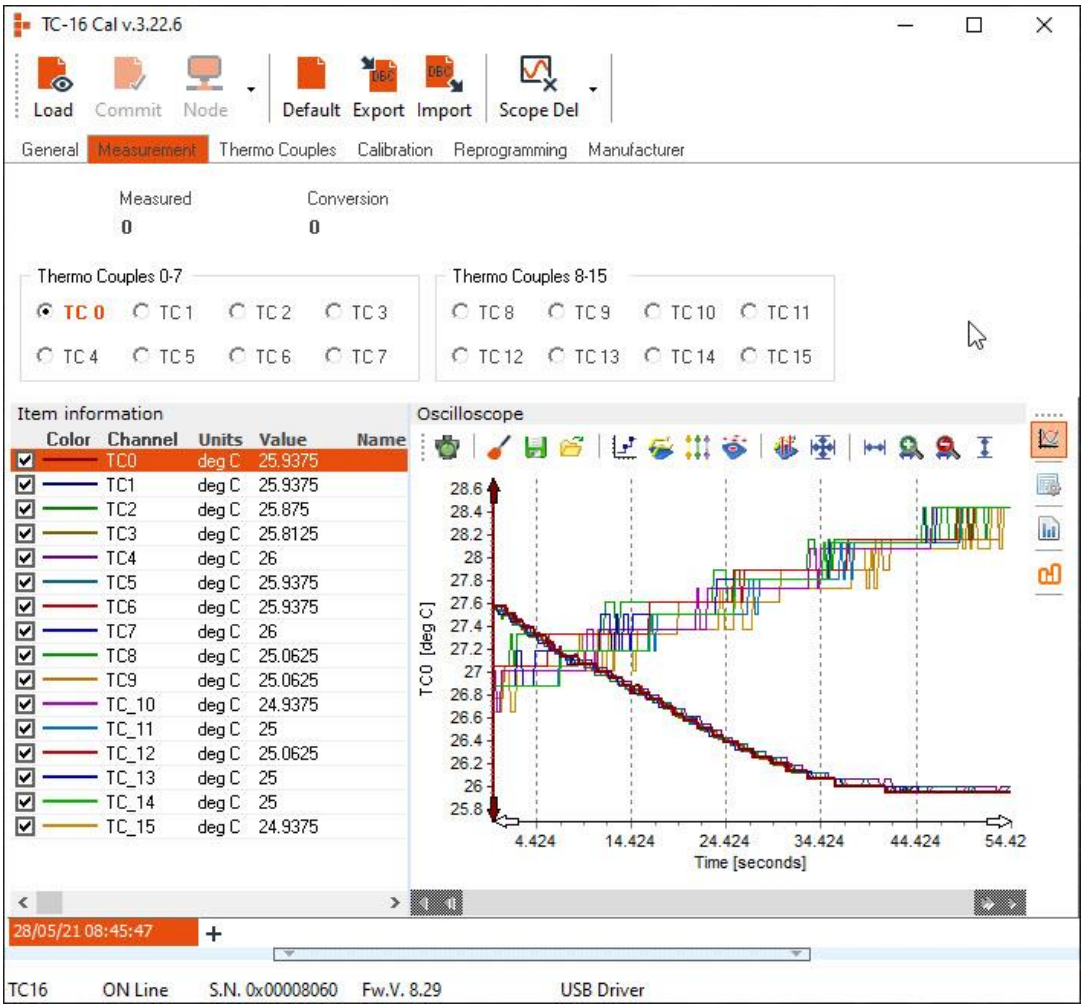
For the above example, please install the Rebel Drivers



For the above example, please install the KTC Drivers

4.5. Using K-TCxx Cal to display data.

You can use the K-TCxx Cal application to visually display the Thermocouple being measured by the K-TCxx.



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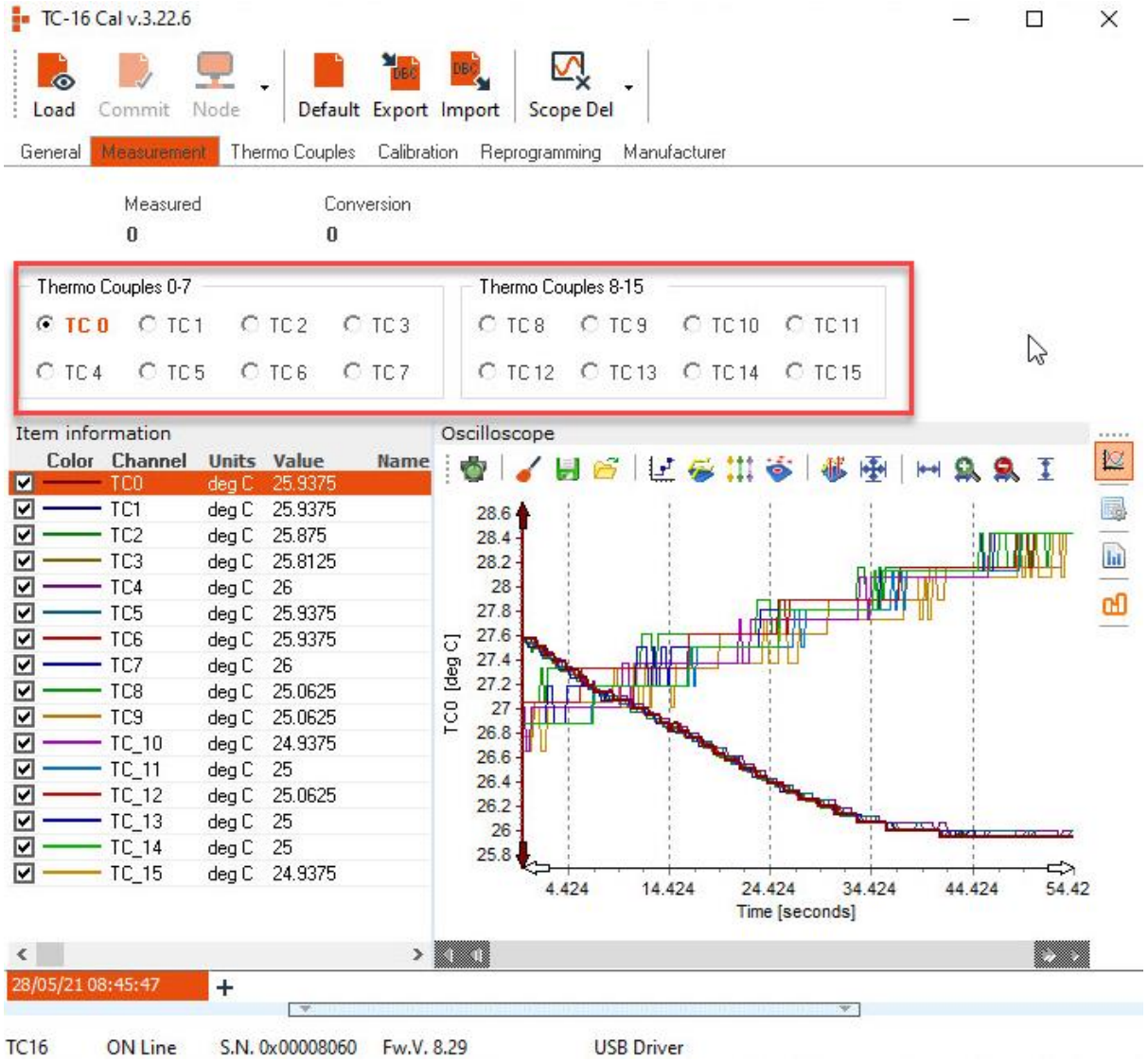
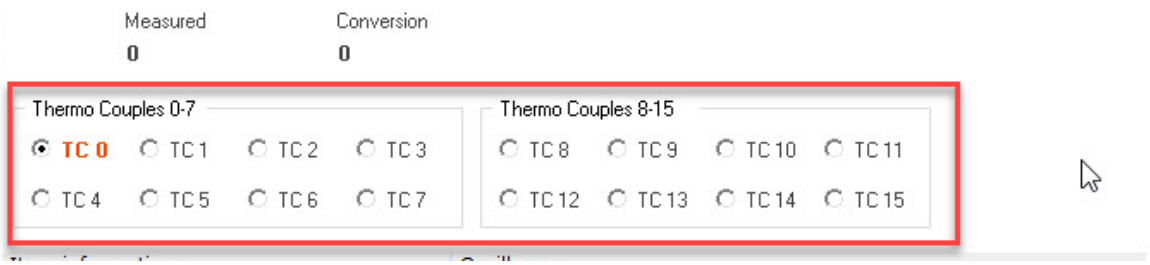
4.6. Channel Display

The top area of the Measurement Tab is used to display the Measured Values for each of the K-TCxx Channels.



4.7. Selecting the Channel to display

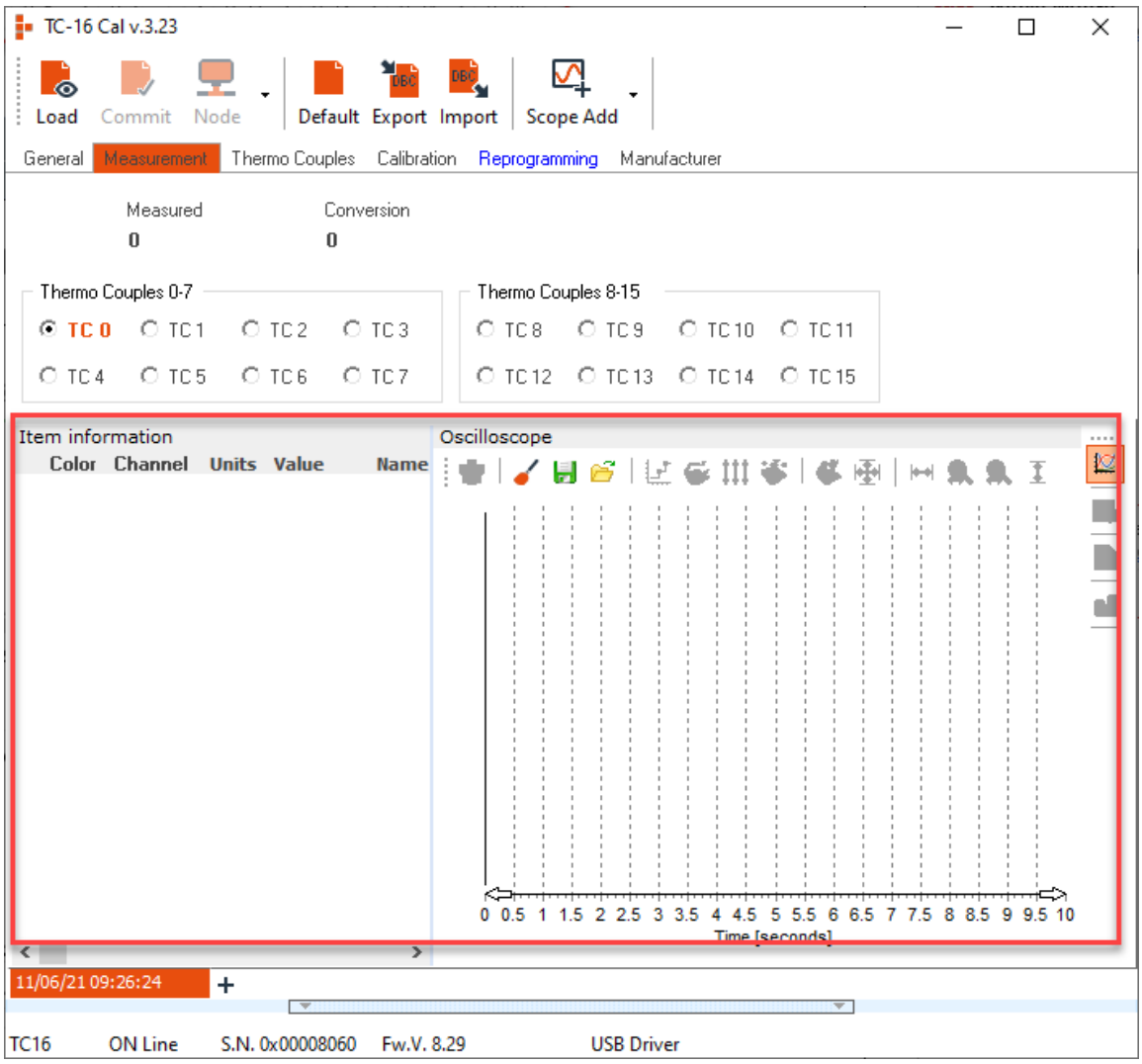
Simply click on the radio button of the channel you wish to display, the Actual Measured Value will be displayed.



© Influx Technology.

5. Using the Oscilloscope to display data

The lower area of the Measurement Tab is used to display the Oscilloscope:



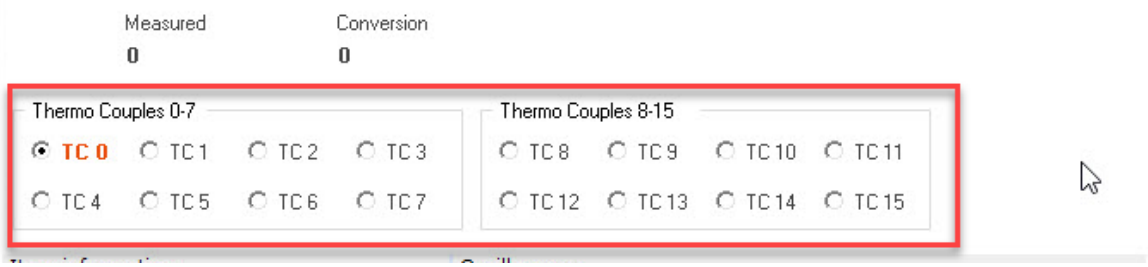
There are several ways to add items to the Oscilloscope

5.1. Individually Adding items to the Oscilloscope

Items can be added to the Oscilloscope individually by following the following steps:

Step 1

Click the Channel you want to add to the Oscilloscope:



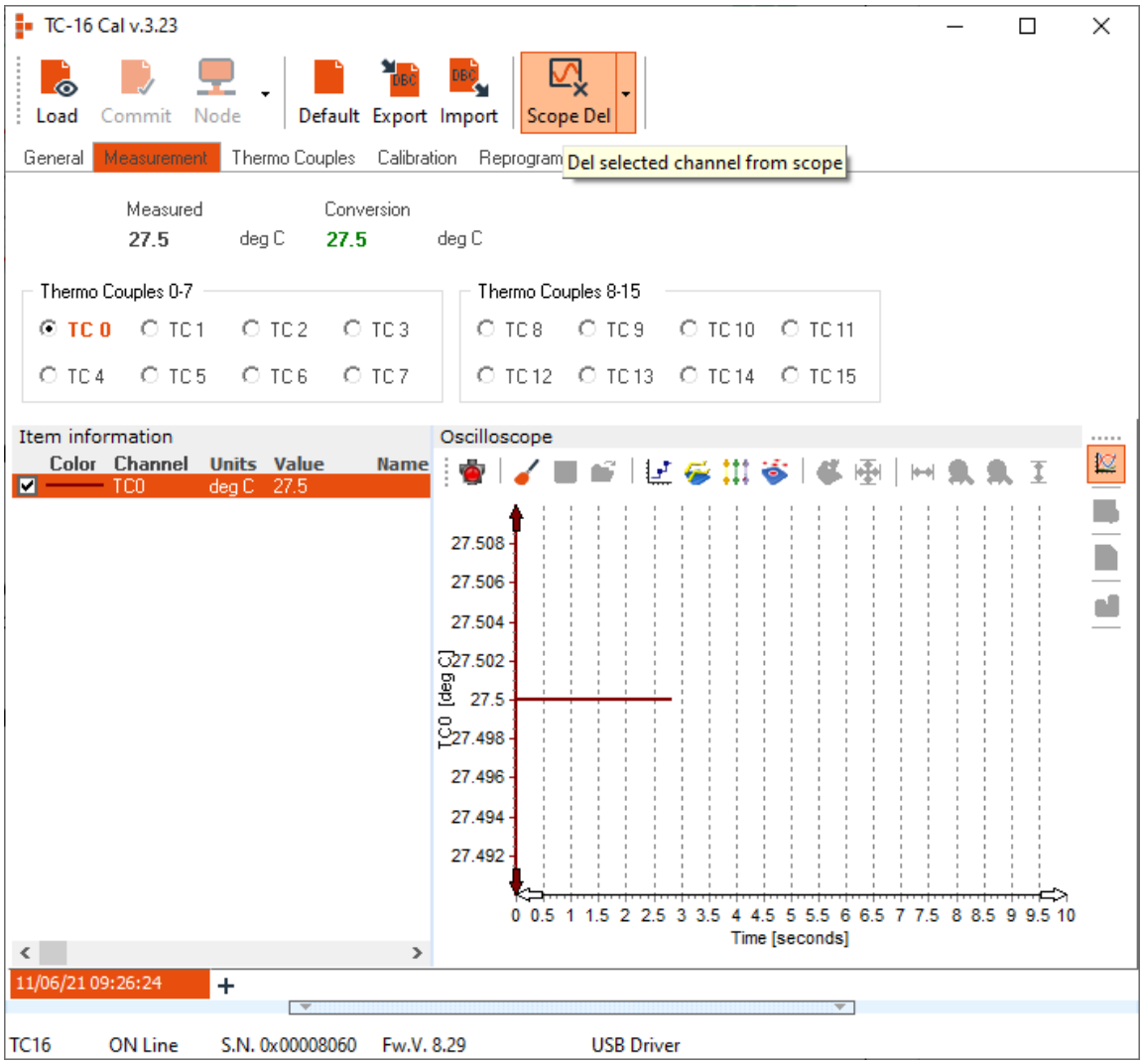
© Influx Technology.

Step 2

Scope Add

Click the Scope add button

The channel will be added to the Oscilloscope.



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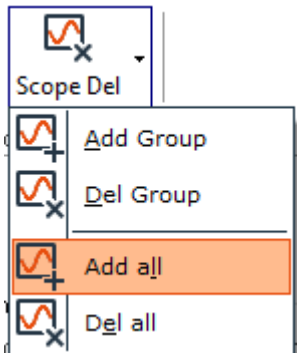
5.2. Adding All Channels to the Oscilloscope (Method 1)

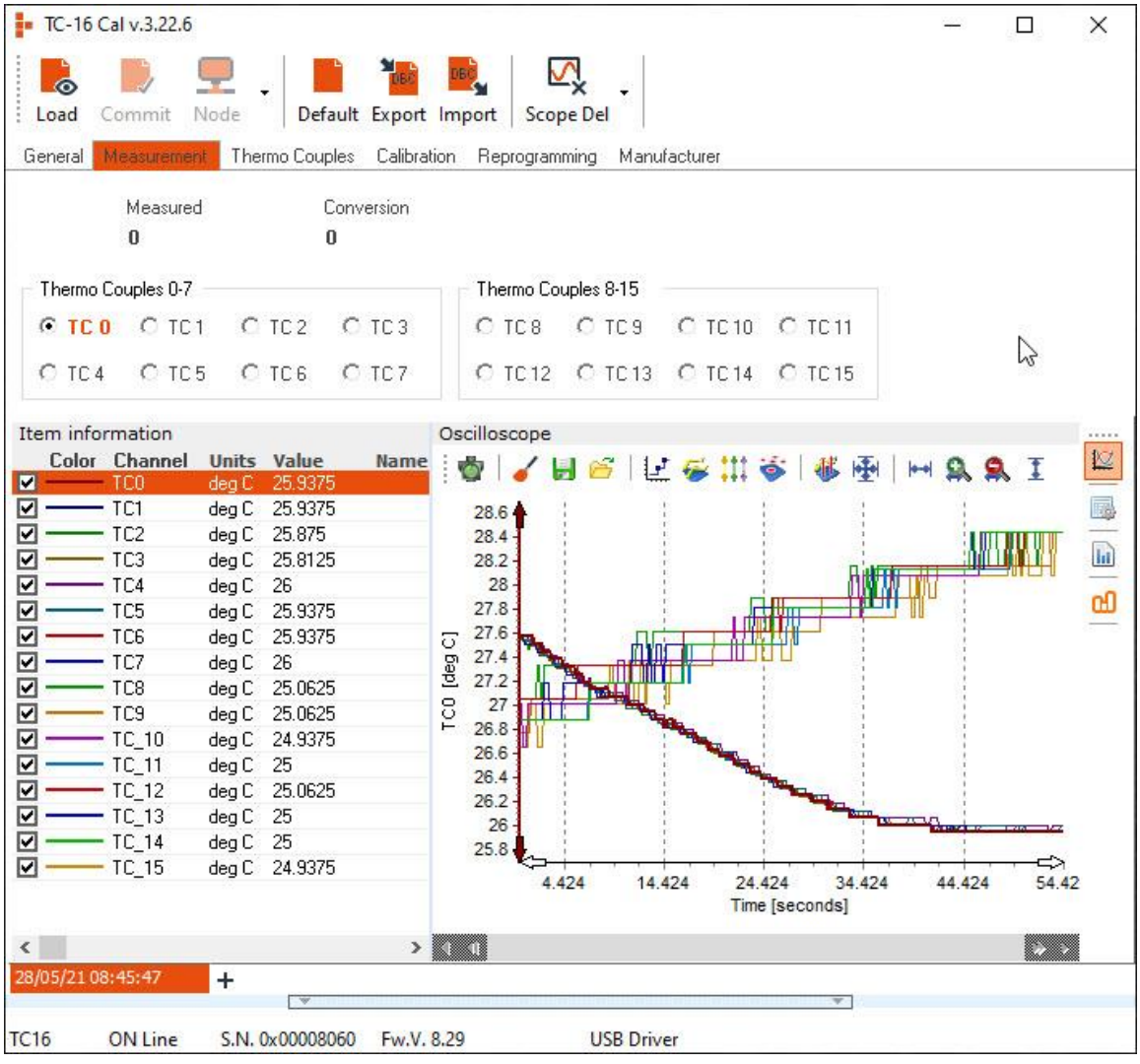
All Channels can be added to the Oscilloscope by following the following steps:

Step 1



Click the Scope add / Add all button

All channels will be added to the Oscilloscope.



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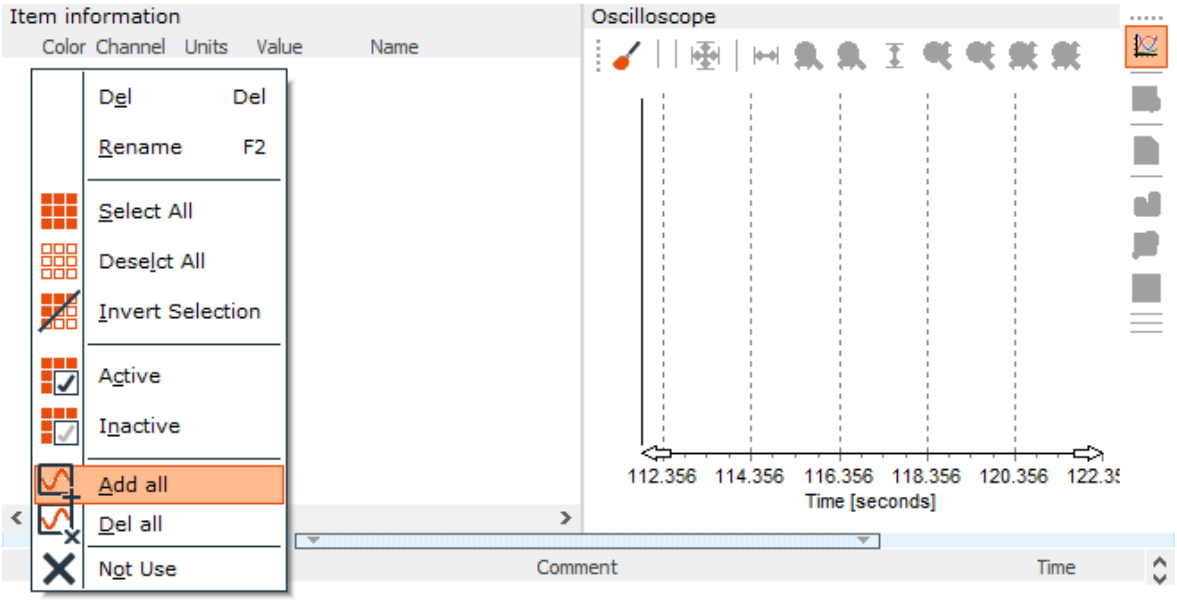
5.3. Adding All Channels to the Oscilloscope (Method 2)

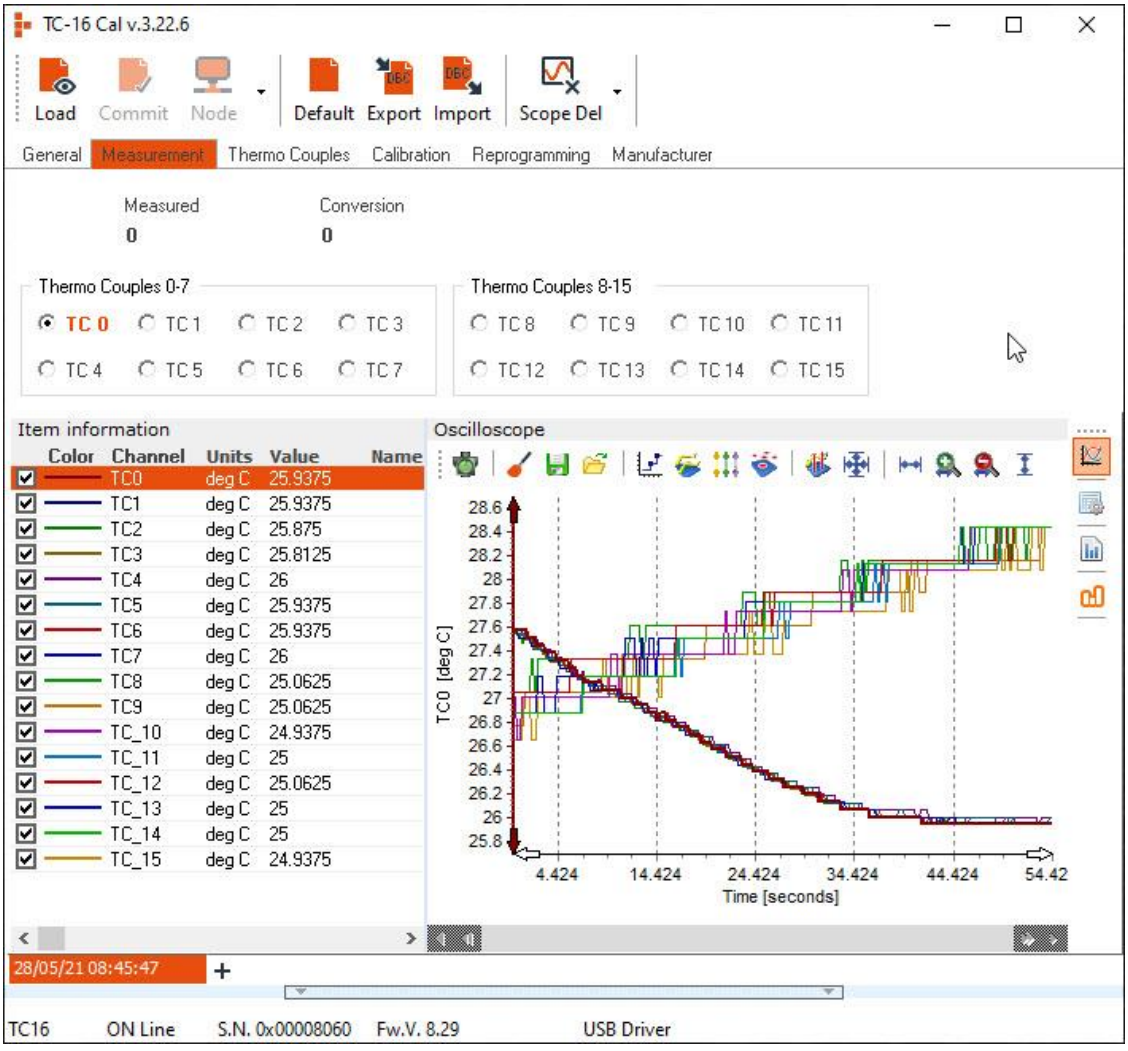
All Channels can be added to the Oscilloscope by following the following steps:

Step 1

Right-click in the Item Information Area and Select Add all:



All channels will be added to the Oscilloscope.



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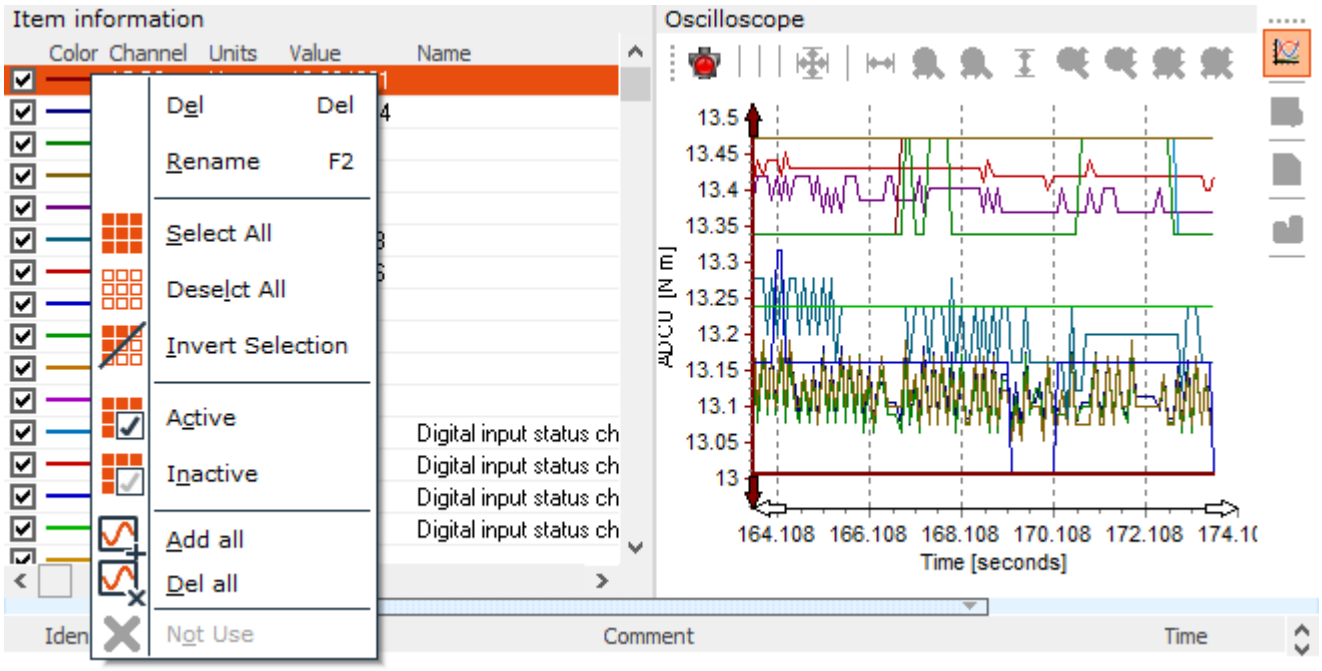
5.4. Working with items added to the Oscilloscope

Right-click in the Item Information Area; this will bring up the following menu



The Menu Items allow the following functionality:

Del	Deletes the item or item selected in Orange
Rename	Assigns a Name to the Channel; this will appear in the Name column
Select All	Selects all items
Deselect All	Deselects all items
Invert Selection	Selects all items not currently selected and deselects the items currently selected
Activate	Makes the selected items 'Active', they will be shown on the Oscilloscope
Inactive	Makes the selected items 'Inactive', they will NOT be shown on the Oscilloscope
Add all	Adds all items to the Oscilloscope
Del all	Deletes all items from the Oscilloscope
Not Use	Removes conversion tables or formulas from the selected item(s)

5.5. Using the Oscilloscope

The 'Oscilloscope' functionality is controlled by a dedicated toolbar which is considered below. Each feature is then considered individually.

1. Allows the Oscilloscope to go online
2. Clear the Logged Data in the Oscilloscope
3. Saves the data Logged in the Oscilloscope, it can be saved in:
   - Vector MDF (.DAT)
   - MATLAB 5.0 (.MAT)
   - MATLAB 5.0 Structured single or double precision (.MAT)

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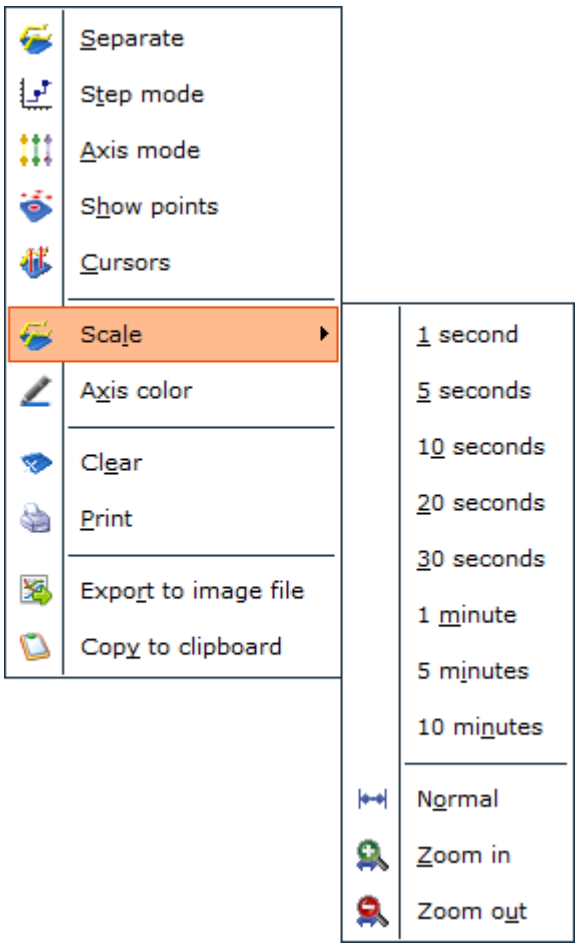
- MATLAB 5.0 Structure Extended (.MAT)
- Comma Separated Variables (.CSV)

4 Opens previously Logged data files.
5 Show steps between data points
6 Separate Items on Oscilloscope
7 Axis display modes
8 Show item points
9 Show cursors
10 Reset Zoom Factor
11 Reset X-axis Zoom Factor
12 Zoom X-axis in
13 Zoom X-axis Out
14 Fit Items to visible zoom area
15 Zoom Y-axis in
16 Zoom Y-axis Out
17 Zoom all axis in
18 Zoom all axis Out

Right-Clicking on the oscilloscope also brings up a menu with several further options; these include changing the scale of the time axis to several different resolutions and changing the axis colour, clearing the data, printing, and printing exporting the image displayed on the scope.



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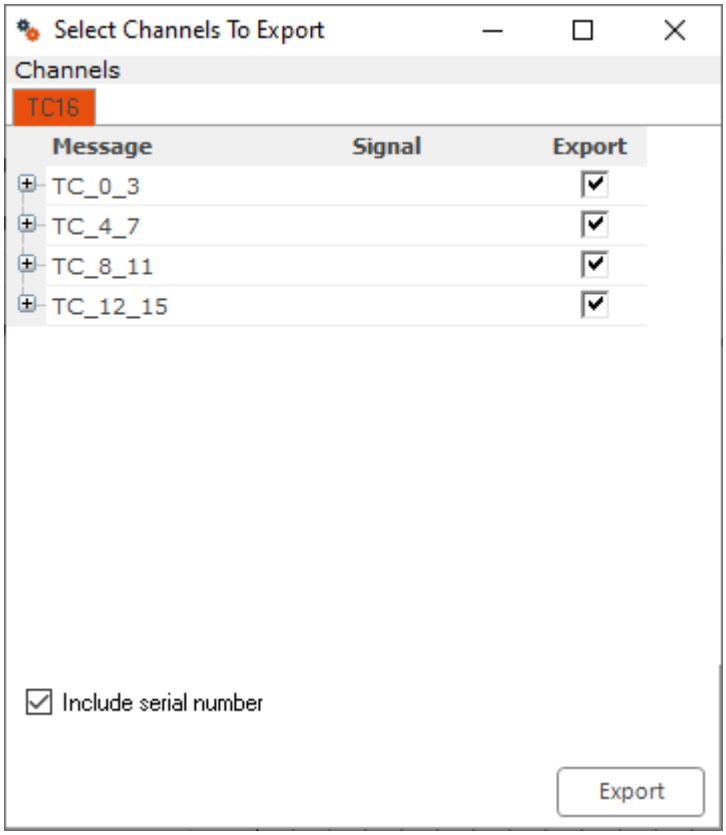
6. Exporting a DBC file

Using the DBC Export Feature allows you to export the Conversion tables and Formulas Applied to the various Analog channels for use in other tools such as DiaLog.

Step 1

Export

Clicking DBC Export will open the DBC export window.



Step 2

Select the channels which you wish to include in the DBC and click Export.

Step 3

Choose the location where you wish to save the DBC file.

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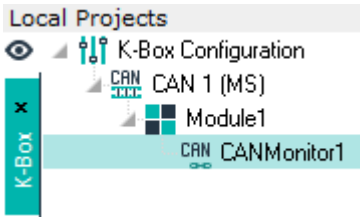
7. Loading the K-TCxx configuration into DiaLog.

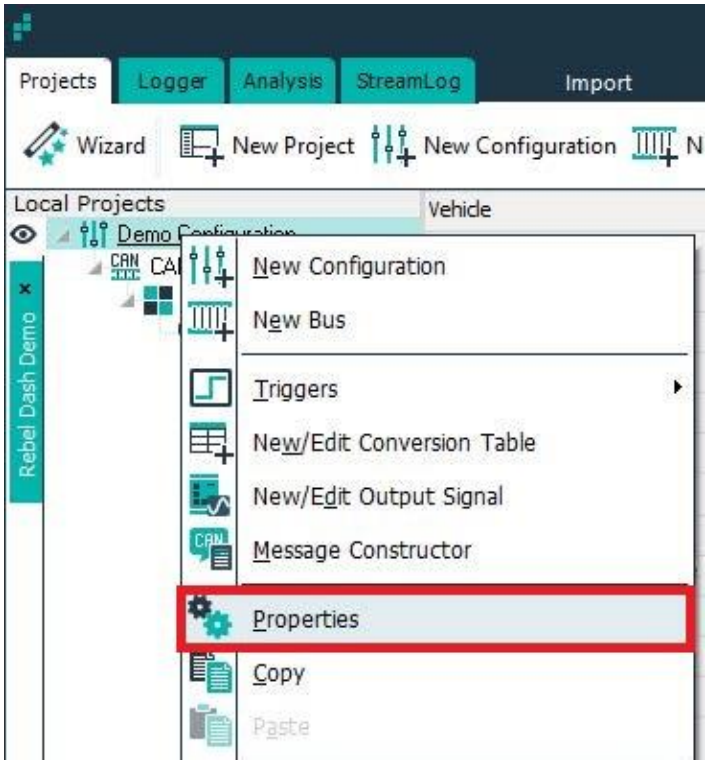
Once the K-TCxx is configured as you wish to use it and have generated a DBC file that describes its configuration, you may load that description file into DiaLog and use it to configure the Logger to record the data output by the K-TCxx.



If you power it from the Logger, the Logger will need to be powered from the vehicle or an external power source **(NOT just via USB)**, and you will need to make sure the AUX power feature in the configuration is set to on. To do this, follow the Steps Below:

Step 1:

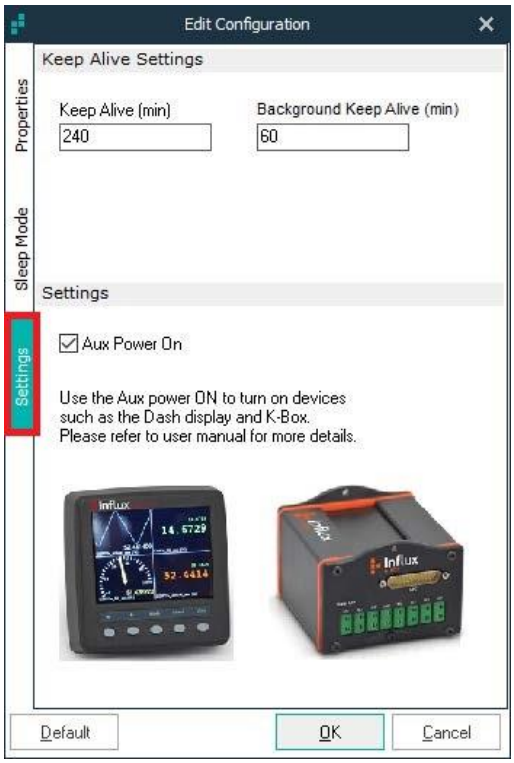
Open DiaLOG, Right-click on a project that has CAN 0 HS bus and selects 'Properties.



©Influx Technology.

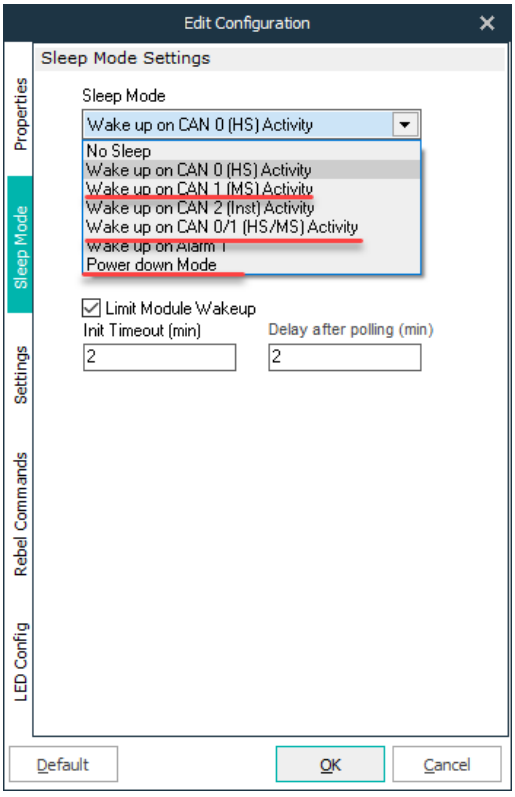
Step 2:

Once the Edit Configuration window is displayed, click on the 'Settings' Tab and put a Checkmark in Aux Power On; Click OK.



Step 3:

Select the sleep mode suitable for you; it is recommended to use:
Wake On CAN 1 or Wake On CAN 0/CAN 1 or Power Down mode.



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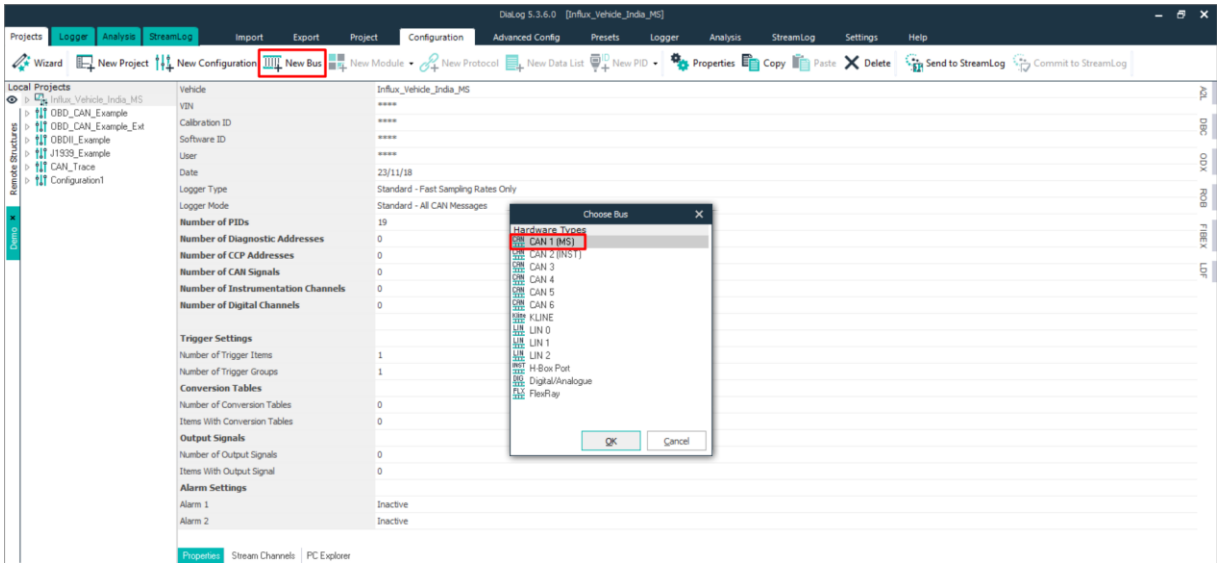
Step 4:

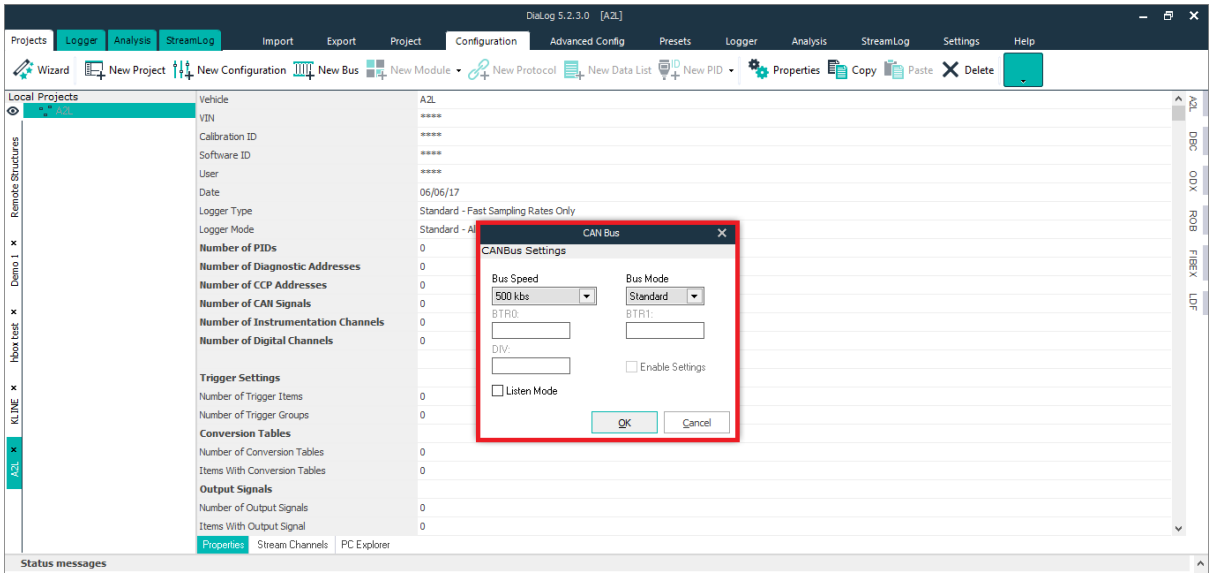
Create new BUS

Select the hardware type (CAN 1 MS) from the popup menu.



Step 5:

Enter the BUS properties



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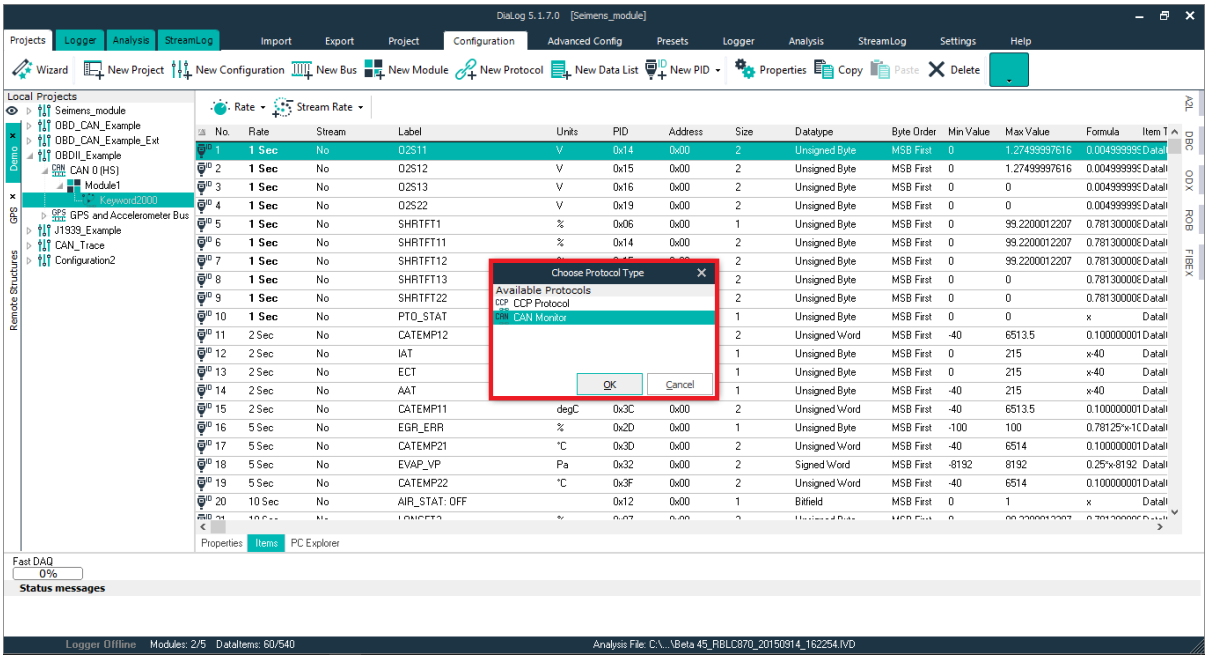
Step 6:

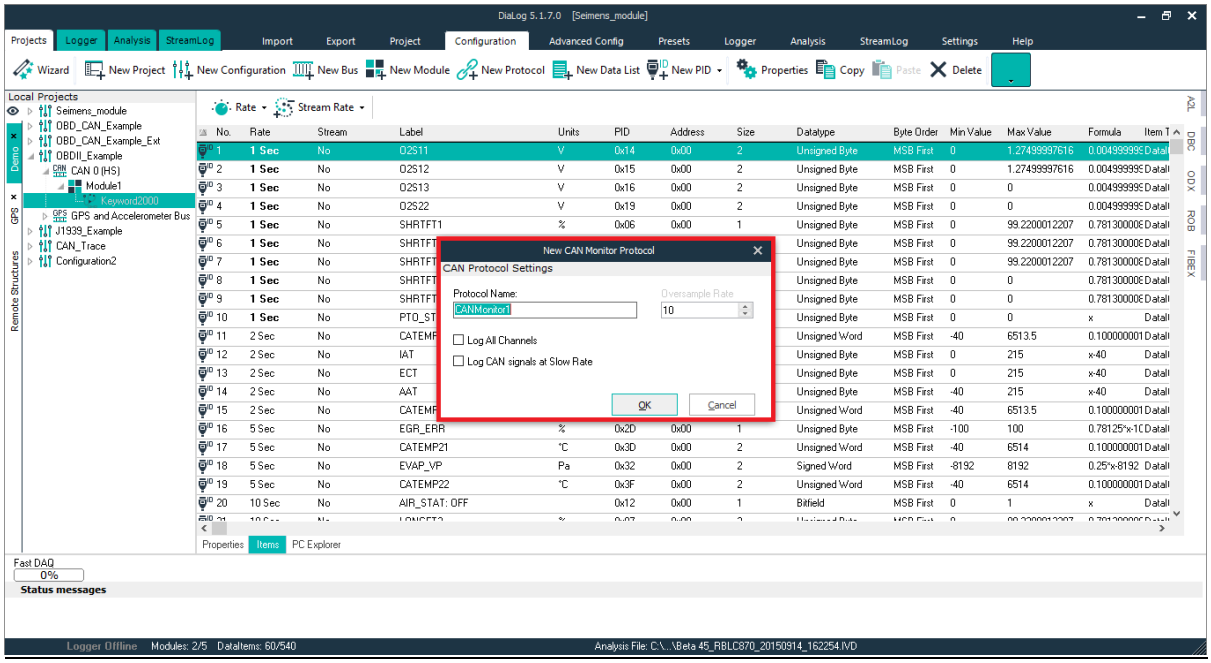
Create New Protocol

Select the CAN Monitor protocol



Step 6:

Assign the settings and protocol name.



Note: Enable 'Log all channels' only if you wish to log all CAN messages appearing on the bus.

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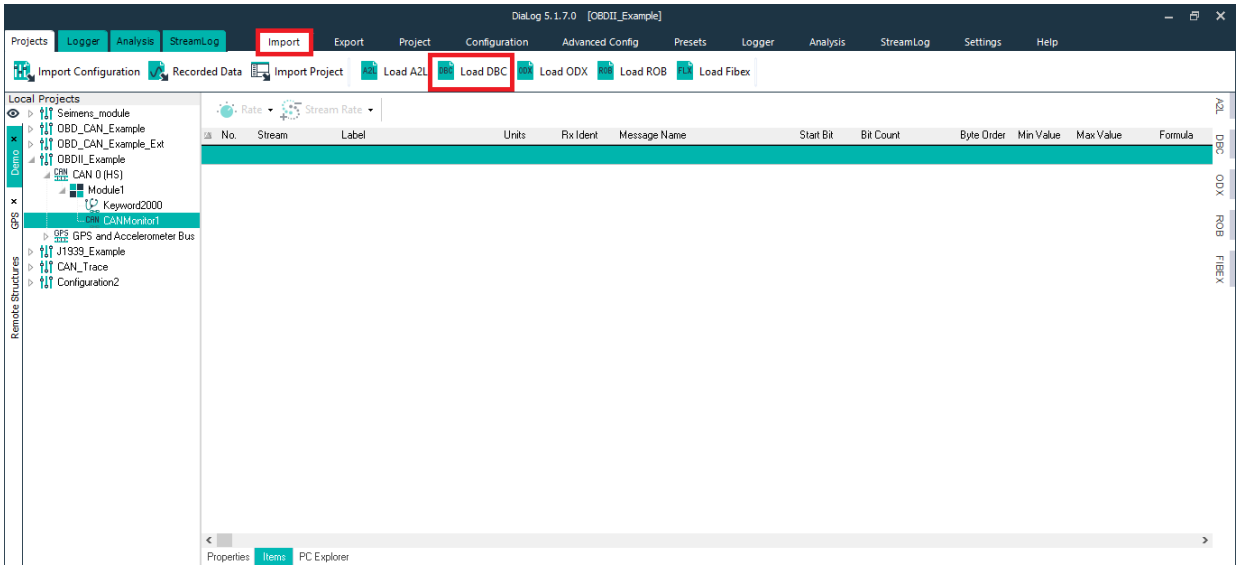
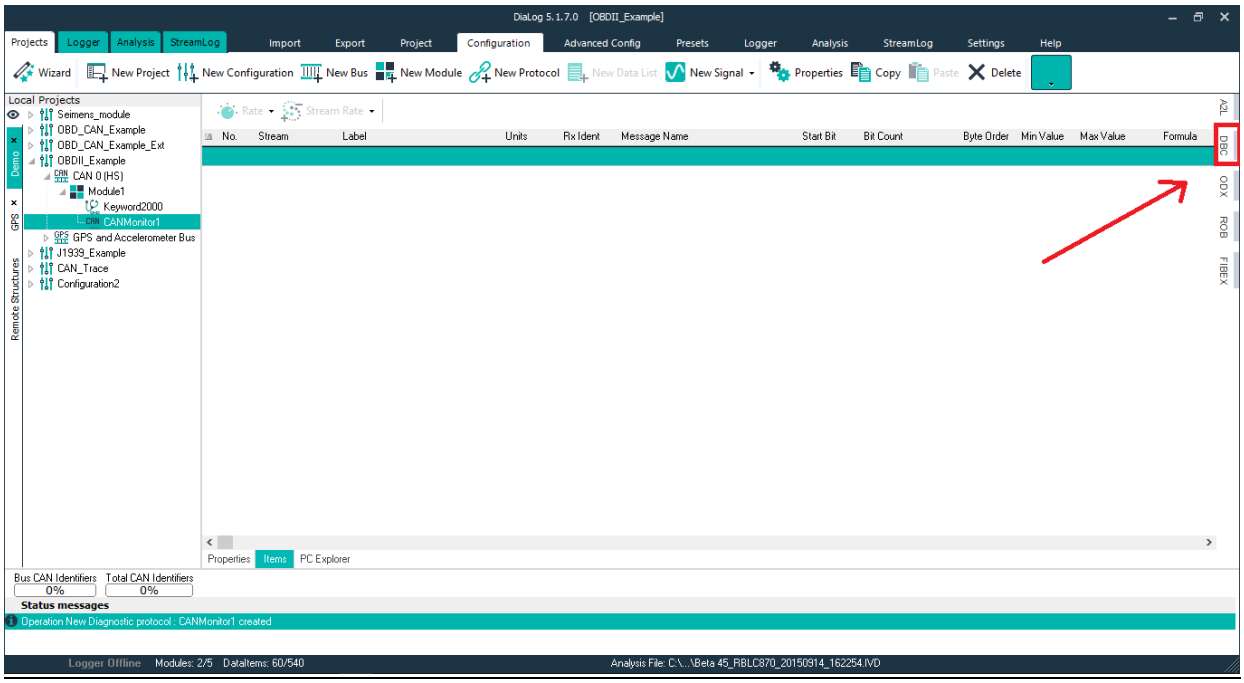
Step 7:

Select the import tab and click load DBC.

Or

Click the DBC tab on the right side.





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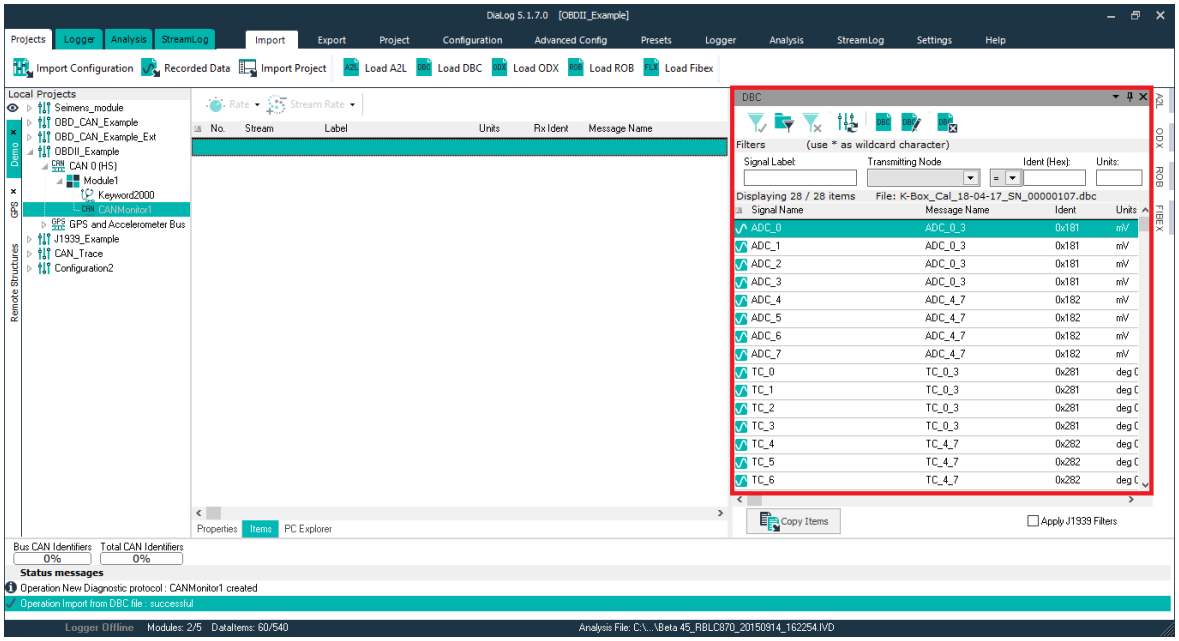
Step 8:

Select the required signal from the DBC window.

Copy the selected signals and paste them to the DAQ list.



Step 9:

Send the configuration to the Logger.

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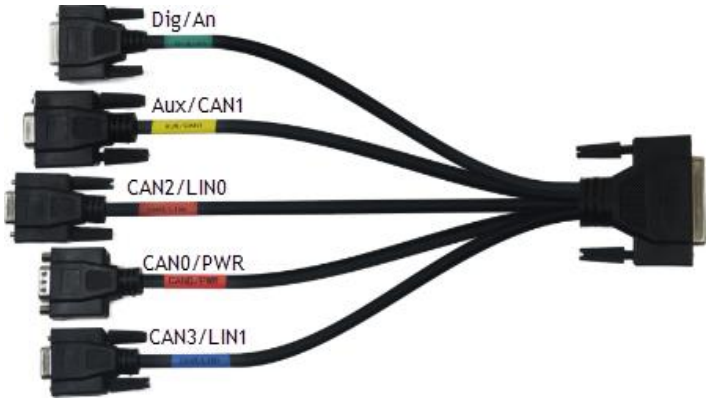
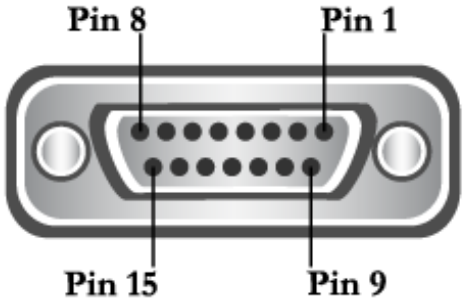
Appendix: Pinout of the Multi Connect Cable

The K-Box may be connected to the AUX cable of the multi-connect cable to allow it to be connected to the Rebel CT or LT Loggers. The pinout is as follows:



Dig/An (This Connector is used to connect Digital and Analogue signals to the Logger)

The Dig & An connector is a Female 15 pin Subminiature D Type connector.

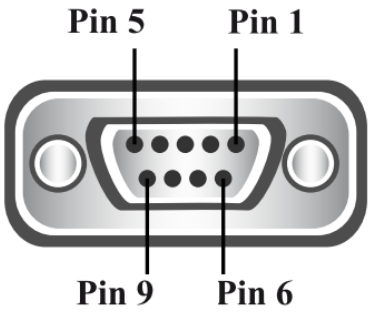


Pin No	Pin Function
Pin 2	Digital Input or Output 1 - When used as an input, do not apply voltages outside the 0 to +12V range. When used as an Output, ensure that the current drawn is not more than 100mA.
Pin 3	+4.5V Instrumentation Supply Voltage, ensure that current draw is not more than 100mA
Pin 4	Ground
Pin 6	Analog Ground
Pin 7	Analog Input 1 - do not apply voltages outside of the -10 to +10V range
Pin 8	Analog Input 3 - do not apply voltages outside of the -10 to +10V range
Pin 9	Digital Input or Output 0 - When used as Input, do not apply voltages outside the 0 to +12V range. When used as an Output, ensure that the current drawn is not more than 100mA.
Pin 10	Digital Input or Output 2 - When used as Input, do not apply voltages outside the 0 to +12V range. When used as an Output, ensure that the current drawn is not more than 100mA.
Pin 11	Ground
Pin 13	Wake-Up pin to wake Logger from sleep mode
Pin 14	Analog Input 0 - do not apply voltages outside of the -10 to +10V range
Pin 15	Analog Input 2 - do not apply voltages outside of the -10 to +10V range

© Influx Technology.

AUX/CAN1 (The port of the Multi Connect Cable that is generally used with the K-Series Device)

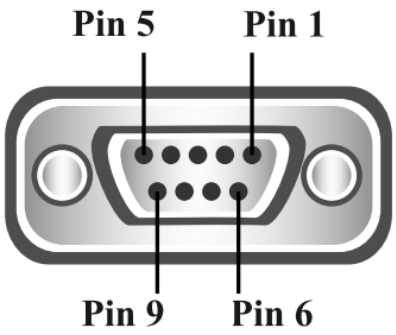
The AUX/CAN1 connector is a Female 9-pin Subminiature D Type connector.



Pin No	Pin Function
Pin 2	CAN Bus 1 (Medium Speed Bus) Low Signal
Pin 3	Ground
Pin 5	Power Ground
Pin 7	CAN Bus 1 (Medium Speed Bus) High Signal
Pin 9	Power Supply Switched

CAN2/LIN0 (Used for connecting CAN2 and Ethernet to the Logger)

The connector is a Female 9-pin Subminiature D Type connector.



Pin No	Pin Function
Pin 1	LIN 0
Pin 2	CAN / CAN FD Bus 2 (Instrumentation Bus) Low Signal
Pin 3	Ground
Pin 5	Power Ground
Pin 7	CAN / CAN FD Bus 2 (Instrumentation Bus) High Signal
Pin 9	Digital Input or Output 3 (can also be used as a switched power supply +Vd). When used as Input, do not apply voltages outside of the 0 to +12V range

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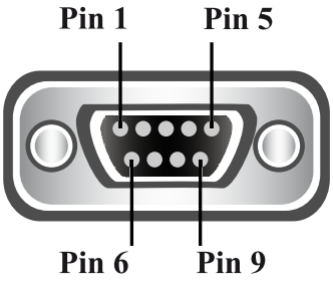
CAN0/PWR (This Connector is used to power the Logger, e.g. it could be powered via the diagnostics connector of a vehicle connected to the OBD2 to DB9 Cable)

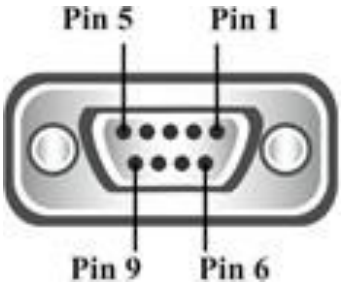
The CAN0/PWR connector is a Male 9-pin Subminiature D Type connector.



Pin No	Pin Function
Pin 1	CAN Bus 1 (Medium Speed Bus) Low Signal
Pin 2	CAN Bus 0 (High Speed Bus) Low Signal
Pin 3	Ground
Pin 4	K-Line (1 wire bus) of ISO 9141
Pin 5	Power Ground
Pin 7	CAN Bus 0 (High Speed Bus) High Signal
Pin 8	CAN Bus 1 (Medium Speed Bus) High Signal
Pin 9	4.5-36V Supply Voltage

CAN3/LIN1

The CAN3/LIN1 is a Female 9-pin standard D-type connector with screws



Pin No	Pin Function
Pin 1	LIN 1
Pin 2	CAN / CAN FD Bus 3 (Instrumentation Bus) Low Signal
Pin 3	Ground
Pin 5	Power Ground
Pin 7	CAN / CAN FD Bus 3 (Instrumentation Bus) High Signal
Pin 9	Digital Input or Output 3 (can also be used as a switched power supply +Vd). When used as Input, do not apply voltages outside of the 0 to +12V range

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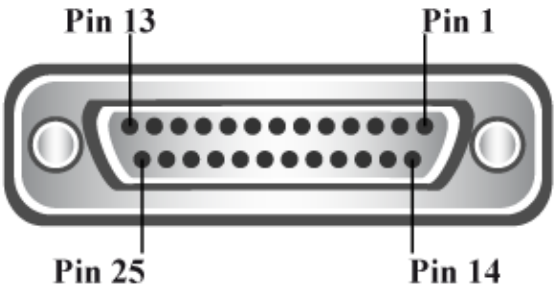
OBD&INST (The multi connect cable attaches to the Logger via this connector)

The OBD&INST connector is a Female 25-pin Subminiature D Type connector.



Pin No	Pin Function
Pin 1	Analog Input 3 - do not apply voltages outside of the -10 to +10V range
Pin 2	LIN 1
Pin 3	CAN / CAN FD 3 L
Pin 4	Analog Input 1 - do not apply voltages outside of the -10 to +10V range
Pin 5	Wake-Up pin to wake Logger from sleep mode
Pin 6	CAN Bus 1 (Medium Speed Bus) Low Signal
Pin 7	CAN Bus 0 (High-Speed Bus) Low Signal
Pin 8	K-Line (1 wire bus) of ISO 9141
Pin 9	4.5-36V Supply Voltage
Pin 10	+4.5V Instrumentation Supply Voltage, ensure that current draw is not more than 100mA
Pin 11	Digital Input or Output 2 - When used as Input, do not apply voltages outside the 0 to +12V range. When used as an Output, ensure that the current drawn is not more than 100mA.
Pin 12	Digital Input or Output 0 - When used as Input, do not apply voltages outside the 0 to +12V range. When used as an Output, ensure that the current drawn is not more than 100mA.
Pin 13	CAN / CAN FD Bus 2 (Instrumentation Bus) Low Signal
Pin 14	Analog Input 2 - do not apply voltages outside of the -10 to +10V range
Pin 15	LIN 0
Pin 16	CAN / CAN FD 3 H
Pin 17	Analog Input 0 - do not apply voltages outside of the -10 to +10V range
Pin 18	Analog Ground
Pin 19	CAN Bus 1 (Medium Speed Bus) High Signal
Pin 20	CAN Bus 0 (High Speed Bus) High Signal
Pin 21	Ground
Pin 22	Power Ground
Pin 23	Digital Input or Output 3 (can also be used as a switched power supply +Vd)
Pin 24	Digital Input or Output 1 - When used as Input, do not apply voltages outside the 0 to +12V range. When used as an Output, ensure that the current drawn is not more than 100mA.
Pin 25	CAN /CAN FD Bus 2 (Instrumentation Bus) High Signal

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