User Guide 2022

Ultrasonic Sensor Demo Kit

Quick Starter

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Ultrasonic Sensor Demo Kit

Quick-Starter

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1. Requirements

- USB-A to micro-B cable
- TDK USSM Demo board
- TDK US Sensor
- TDK Demo Software
- PC running windows operating

2. Quick Start Guide

1. Install TDK demo software as described in Software-Installation section 3.
2. Connect the Sensors to the Demo board as in Figure 1.
3. Connect the Demo board to the PC via USB-A to micro-B cable.
4. Double Click on “Sensor User Interface” icon on desktop to user interface to start measurements (more details from section 4).

Figure 1: USSM Demo Kit

3. Software-Installation

3.1 Set-Up Wizard

1. Navigate to the “GUI” folder location.
2. Find the installer (offline) “tdk_install.exe” in 4-Software/installer sub folders.
3. Install demo software by clicking on the installer.
4. TDK Sensor Software set up wizard is launched as shown in Figure 2.
5. Proceed by Clicking on “Next” button to install demo software.

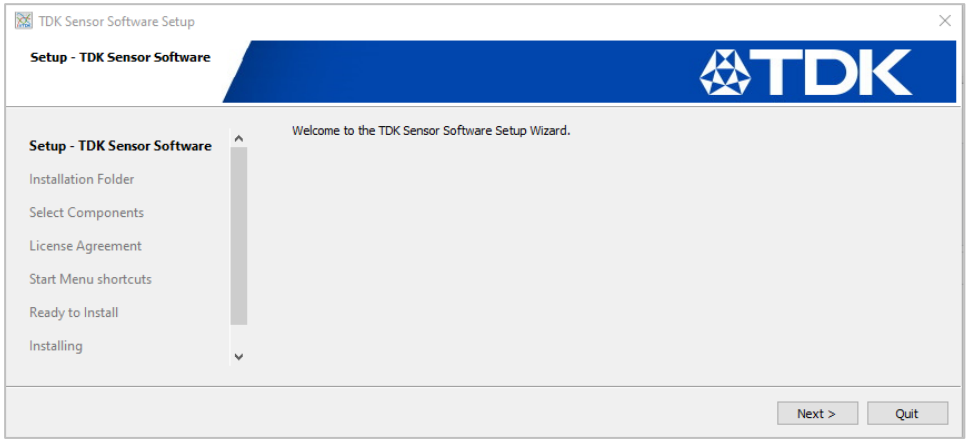
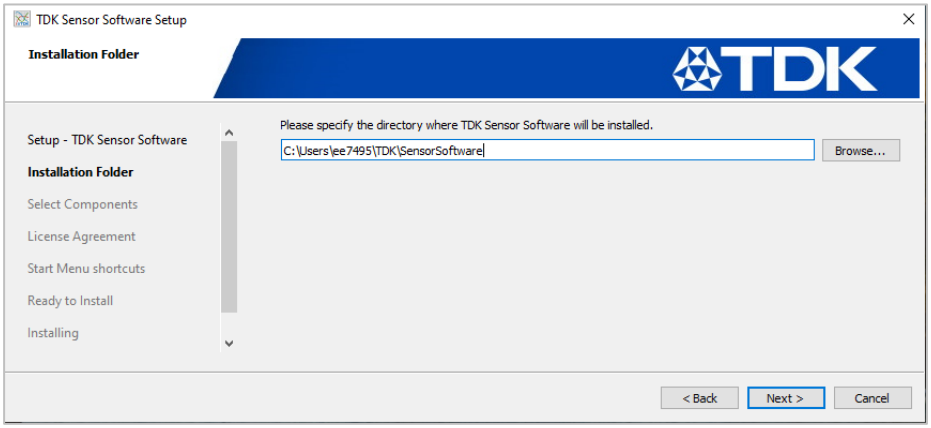
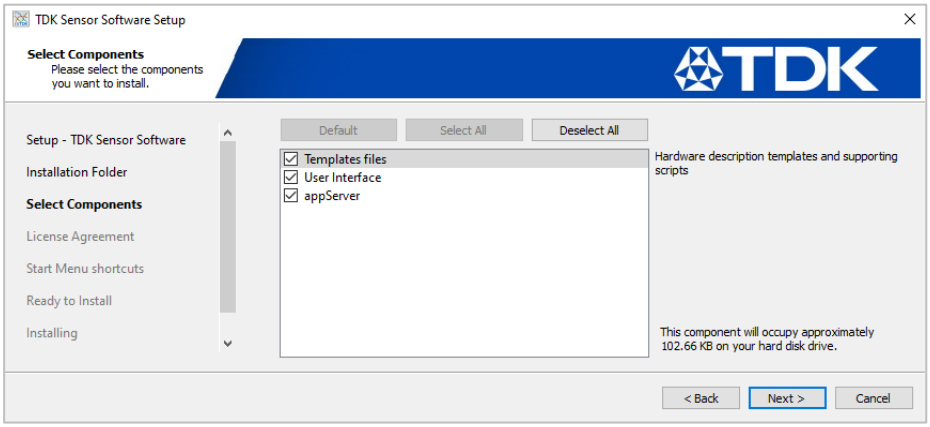


Figure 2: TDK Sensor Software Setup Wizard

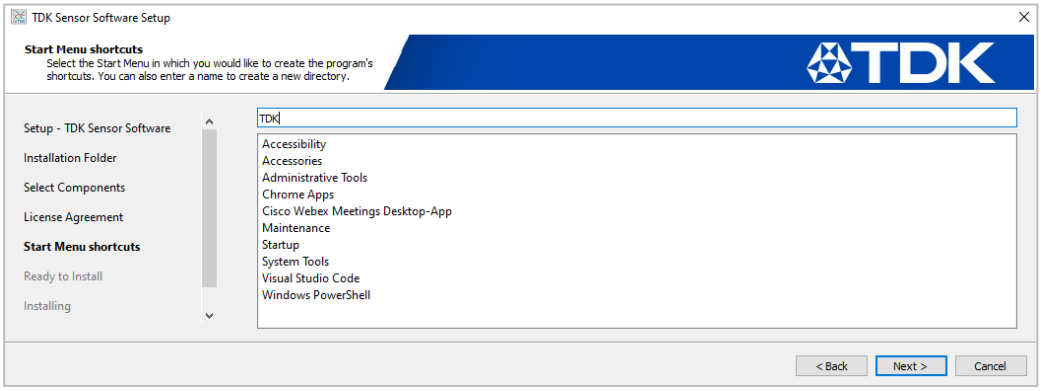
6. By default, installation directory is chosen in users' folder. Click the browse button to select other desired location. Click "Next" to proceed.

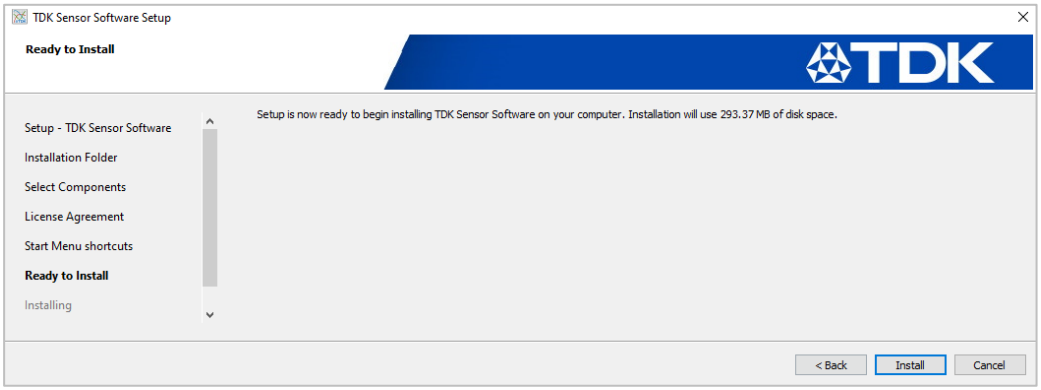


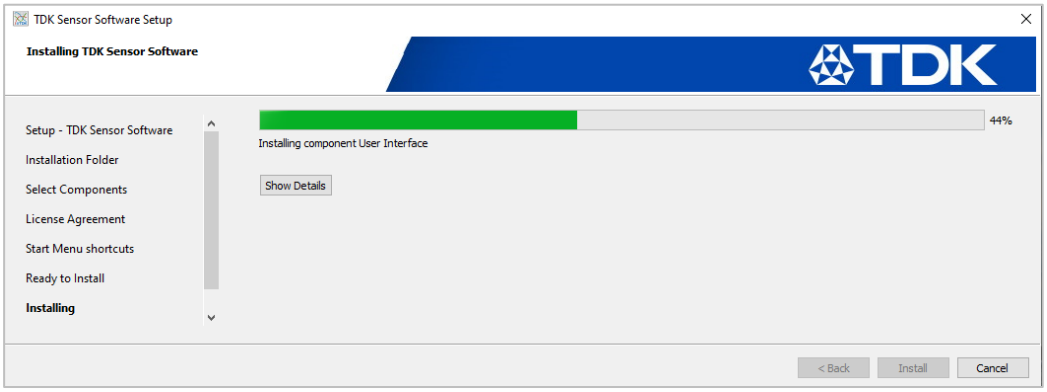
7. Make sure to select all check boxes to select all components (recommended) and click "Next".

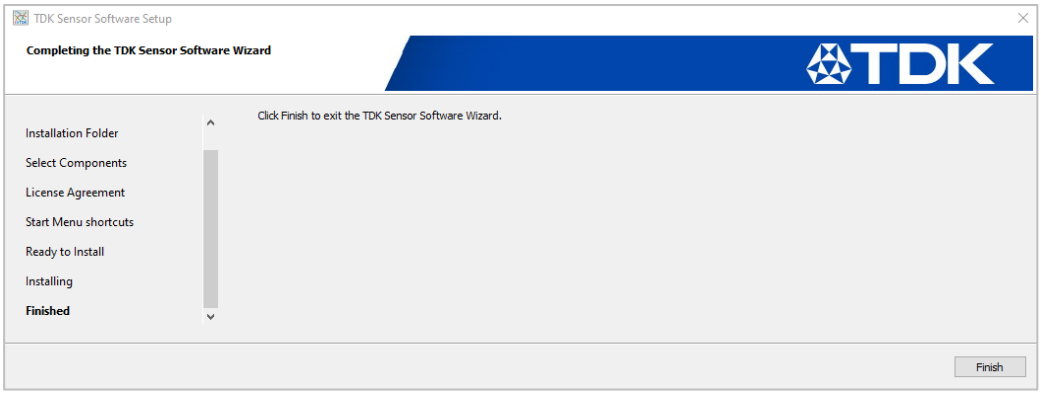


8. Proceed by clicking “Next” button and click on “install” to install software. After installation setup is completed, click on “Finish” button to exit from setup wizard.









9. After successful installation, 3 icons namely “Sensor User Interface”, “Start app Server” and “TDK software maintenance” are shown on desktop as seen in Figure 3.

Figure 3: Installed software icons on Desktop

- Double click on “Sensor User Interface” icon launches the demo software with User Interface (UI).
- “Start app Server” is the main module having interfaces to demo board/sensors on one hand while on the other hand it provides interfacing to http sockets.

Note: Upon launching of demo software by fault it automatically launches app server.

3.2 Maintenance Tool

“TDK Software maintenance” is used to update or reinstall all software modules. The Maintenance tool looks like in Figure 4 upon launch. For example, “remove all components” removes all previously installed software from the PC.

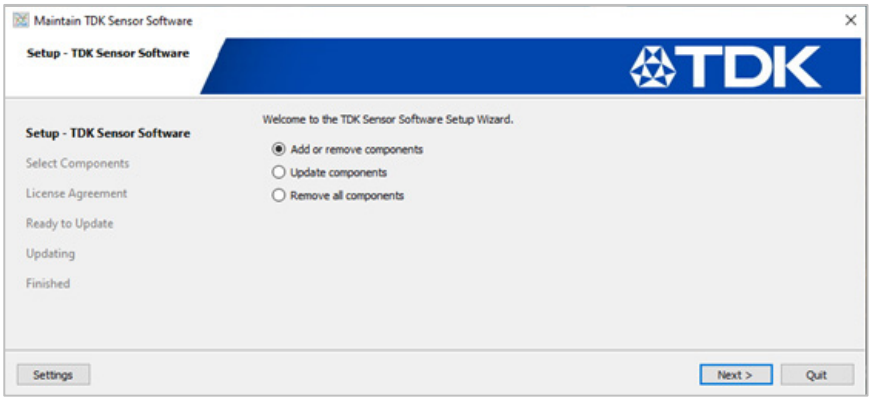


Figure 4: TDK Software maintenance tool

4. UI Main Windows

Figure 5 depicts the main window of the user interface. It consists of the following views- Main menu, channel explorer, measurement explorer, data explorer, properties explorer and terminal. All views are dock windows that means every window can be re-arranged based on user preference with exception of Main menu and data explorer window. The functionality of each window explorer is explained in individual sections.

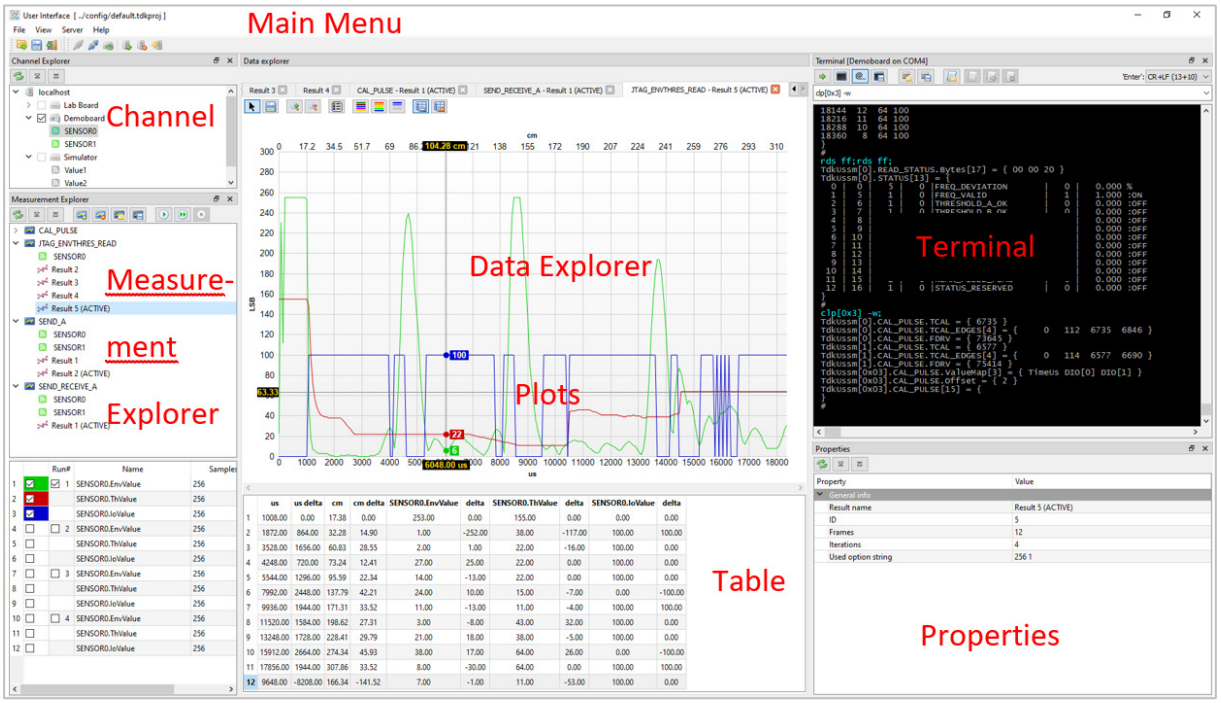


Figure 5: User Interface Window with sub views for the channels, measurements, properties, data, and terminal logging.

5.Main Menu

5.1 Upper Tool Bar

Upper tool bar consists of the four menu items and description is as given below.

- File Button- provides the options such as load/save project, Application settings and Exit as seen in Figure 6.

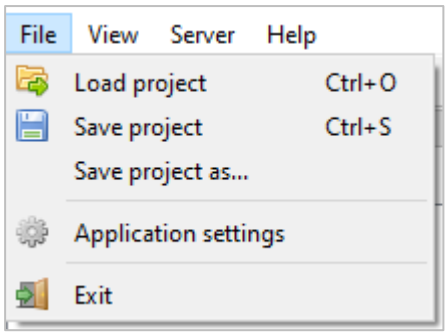


Figure 6: File button options

Application settings option upon selection enables pop up window to select saved data and check box to restore last project as seen in Figure 7.

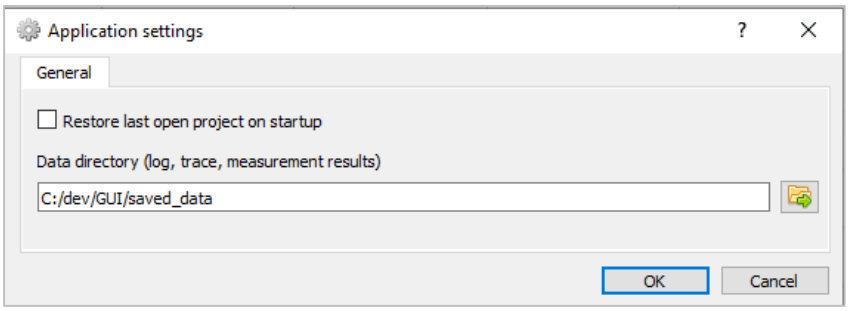


Figure 7: Application settings pop up window.

- View button- to navigate to the TDK web page for demos (Figure 8).

Figure 8: view button demo options

- Server button - provides server control options shown in Figure 9.

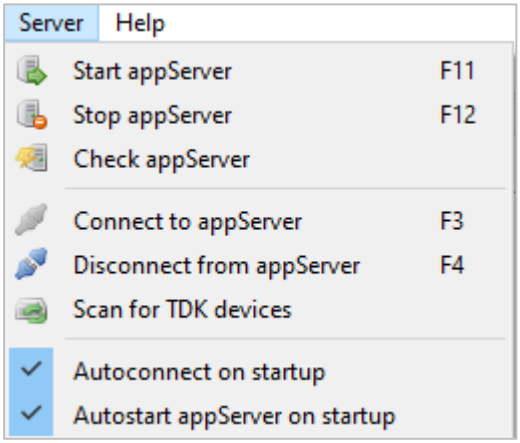


Figure 9: Server Buttons Options

- Help button- provides the software version information.

5.2 Server Control Tool Bar (lower right tool bar)

Server tool bar is as seen in Figure 10.

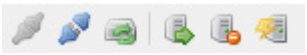


Figure 10: Server control tool bar with icons

After launching the demo software, it automatically connects to the demo. The function of each icon is described below.

- Connects to app Server
- Disconnects from app Server
- Scan USB port
- Start local app server
- Stop local app server
- Check if app server is running

Press start/stop local server icon to manually connect/disconnect from demo board. The connection status of the sensors is seen in channel explorer.

5.3 Project settings (lower left tool bar)

It provides the buttons to load/save project and to exit from the application.

6. Channel Explorer

Fig. 3 shows the channel explorer. It displays available boards and the sensors that are connected to it. The status information of each sensor is displayed on color coding. Green color corresponds to active connection to sensor. If the sensor is not connected, then it is represented in gray color as in Figure 11.

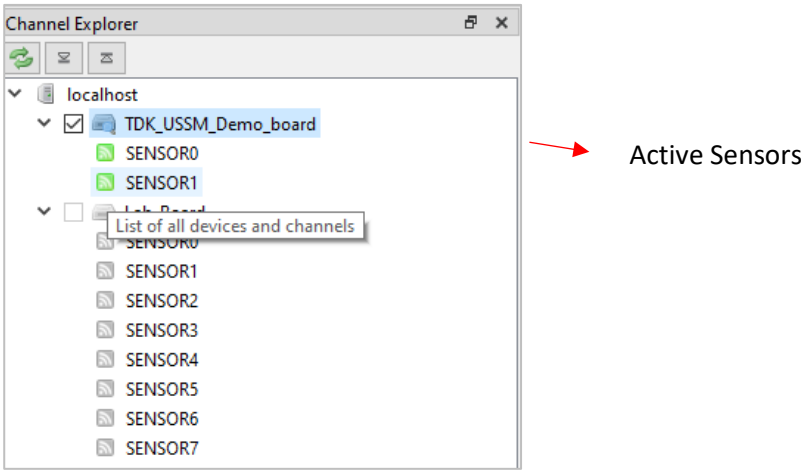


Figure 11: channel explorer with available boars and connected sensors

6.1 Mouse click options

Channel explore provides with the features such as mouse right click and left click on board or sensor as seen in Figure 12 and Figure 13.

- **Right click** on board or sensor shows the available commands to send to board/sensor with a mouse click as seen in Figure 12 and Figure 13.
- **Left click** shows the properties of board or sensor in properties explorer (section 9).

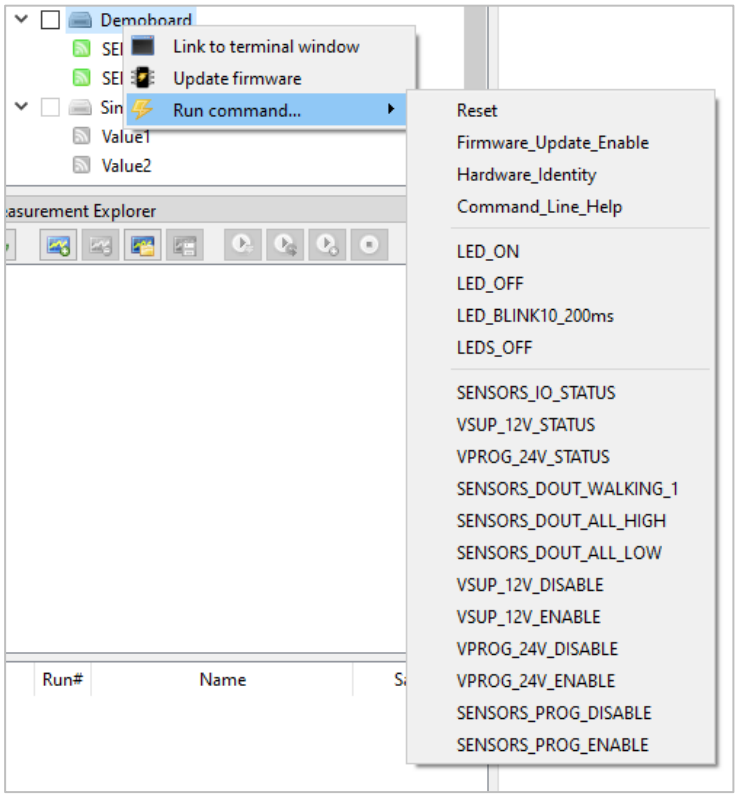


Figure 12: List of available commands to send to the board upon mouse right click.

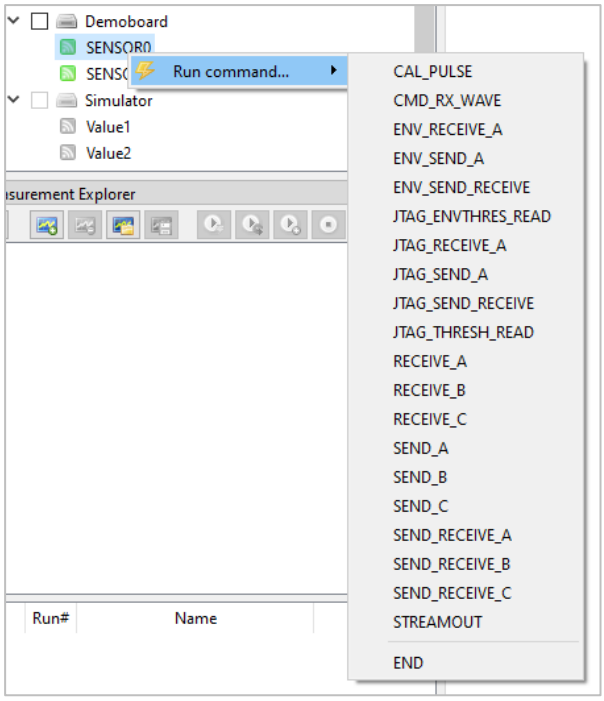


Figure 13: List of available commands to send to the sensor upon mouse right click.

- Refresh channel tree button – updates the actual sensor information i.e. connected or disconnected. The same button is available in measurement and properties explorer to update measurements and properties upon mouse click.

7. Measurement Explorer

This window enables the measurements in real time from the sensors. It is also possible to load previously saved measurements. The functionality of each icon button is as provided below.

- add new measurement
- remove selected measurement
- load a selected measurement
- save selected measurement
- start new measurement /Restart measurement with active result/ Restart measurement and add data to active measurement /stop measurement.

7.1 How to start measurement:

1. Click on add measurement icon which pops up a window (Figure 14) with different measurement options.

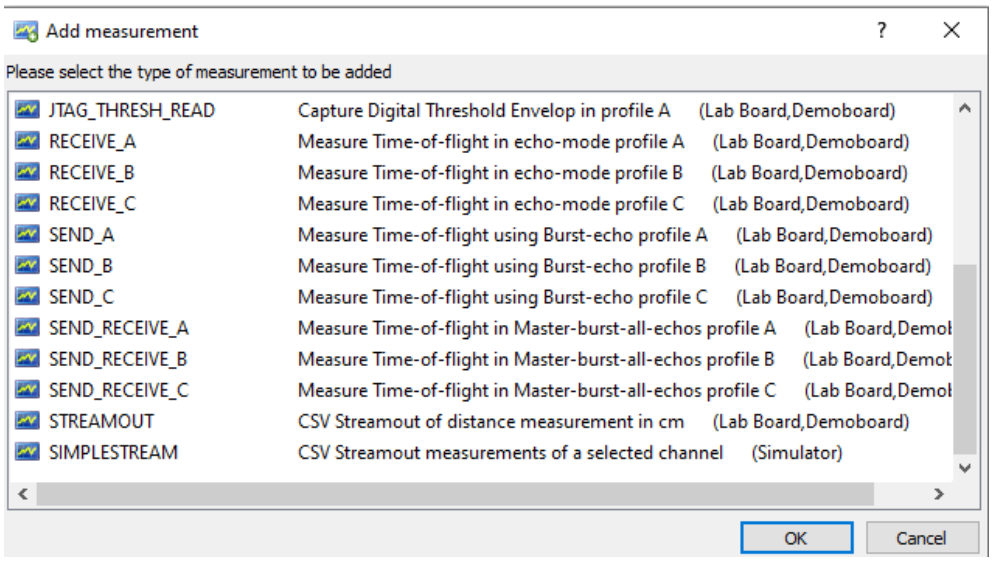


Figure 14: Measurement options

Select the measurement and click on “Ok”

2. A pop-up window (Figure 15) appears to choose the channel (sensor) from and with which previously selected measurement to be carried out. Select the sensor by clicking on check box and click “ok” button.

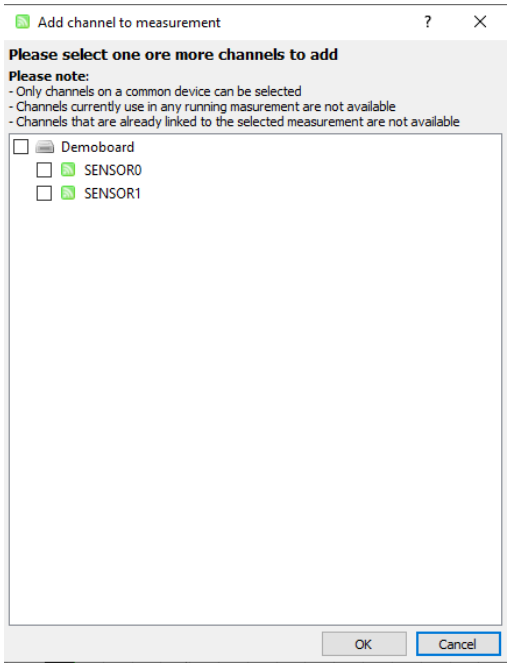


Figure 15: Channel selection for measurements

The selected measurement with associated sensor(s) is displayed in the measurement explorer is as shown in below Figure 16.

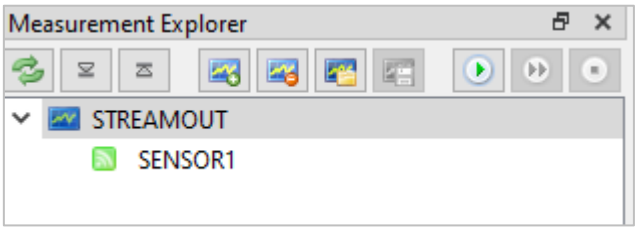


Figure 16: Selected measurement and sensor

3. Start the measurement by clicking on "start measurement" button. Then the result tab is added to the measurement as shown in Figure 17. Results are shown in the Data explorer window in the plots. Measurements are in either continuous mode or single frame mode. All measurement types use single frame to acquire data while steam out measurement is streamed in continuous mode.

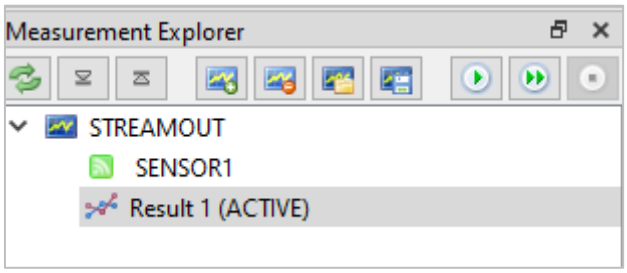
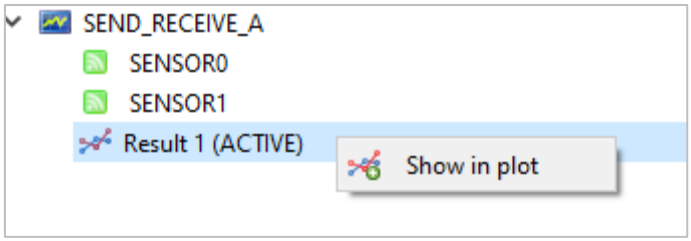


Figure 17: Illustration of active measurement

Measurement explorer provide features upon mouse right click on sensor or result, for example right clicking on the active results displays "show in plot" option to show the plot in data explorer. That means even after closing plots in data explorer user still have option to view it again.



8. Data Explorer

Figure 18 and Figure 19 show the data explorer view. The real time Measurements or recorded measurements are shown in the plots. It also provides tool bar with buttons. The individual functionality of each button is given below.

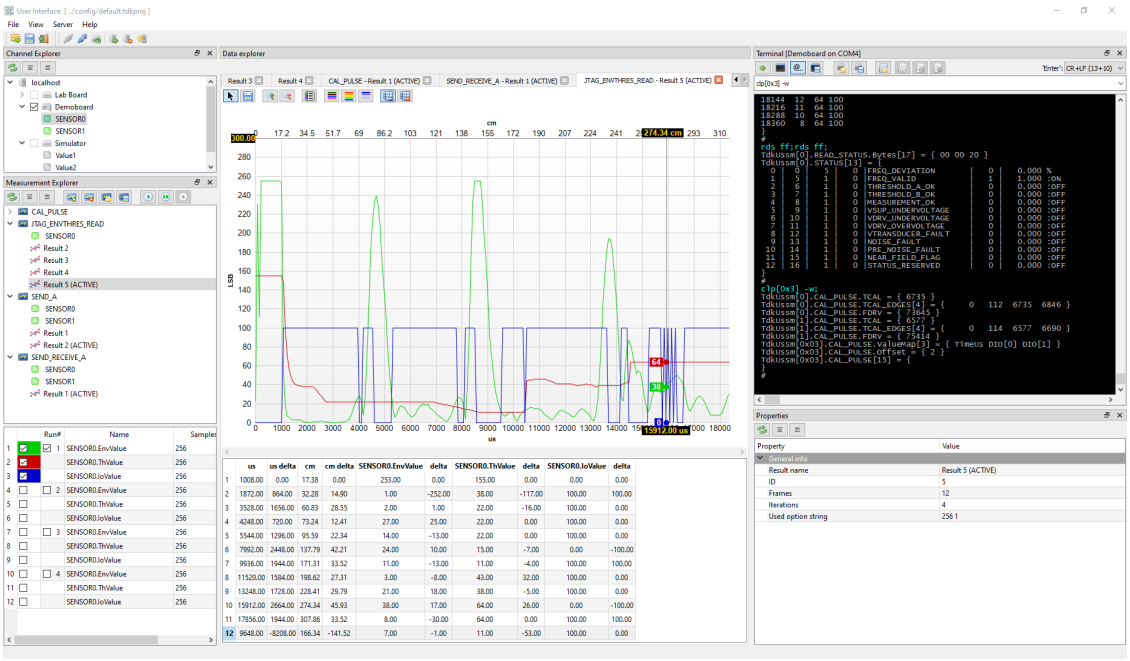


Figure 18: Data Explorer with plots and data points table.

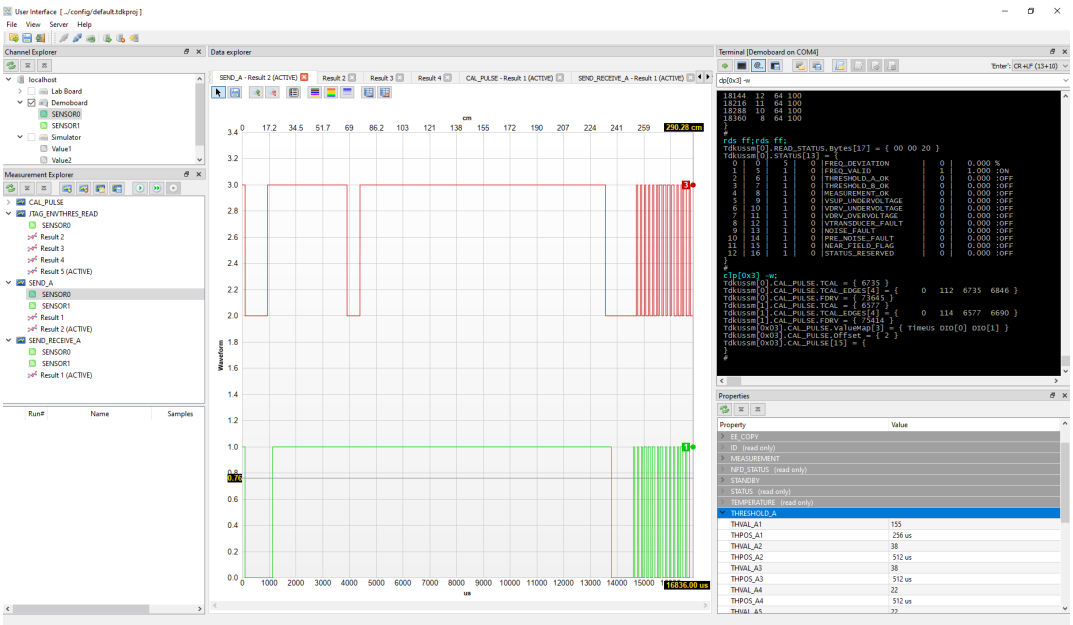


Figure 19: Data explorer view with real time measurements

- pointer button.
- save button to save the plot.
- Zoom in button.
- Zoom out button.
- legend button to show color coding associated with each plot.
- Default palette.
- spectrum palette.
- fadeout palette.
- upon clicked on it a table appears (Figure *20*). User can select data points by mouse click on the plot which are shown in table form.
- clears the table.

	us	us delta	cm	cm delta	SENSOR0.EnvValue	delta	SENSOR0.ThValue	delta	SENSOR0.IoValue	delta
1	1008.00	0.00	17.38	0.00	253.00	0.00	155.00	0.00	0.00	0.00
2	1872.00	864.00	32.28	14.90	1.00	-252.00	38.00	-117.00	100.00	100.00
3	3528.00	1656.00	60.83	28.55	2.00	1.00	22.00	-16.00	100.00	0.00
4	4248.00	720.00	73.24	12.41	27.00	25.00	22.00	0.00	100.00	0.00
5	5544.00	1296.00	95.59	22.34	14.00	-13.00	22.00	0.00	100.00	0.00
6	7992.00	2448.00	137.79	42.21	24.00	10.00	15.00	-7.00	0.00	-100.00
7	9936.00	1944.00	171.31	33.52	11.00	-13.00	11.00	-4.00	100.00	100.00
8	11520.00	1584.00	198.62	27.31	3.00	-8.00	43.00	32.00	100.00	0.00
9	13248.00	1728.00	228.41	29.79	21.00	18.00	38.00	-5.00	100.00	0.00
10	15912.00	2664.00	274.34	45.93	38.00	17.00	64.00	26.00	0.00	-100.00
11	17856.00	1944.00	307.86	33.52	8.00	-30.00	64.00	0.00	100.00	100.00
12	9648.00	-8208.00	166.34	-141.52	7.00	-1.00	11.00	-53.00	100.00	0.00

Figure 20: Table with selected points with mouse click.

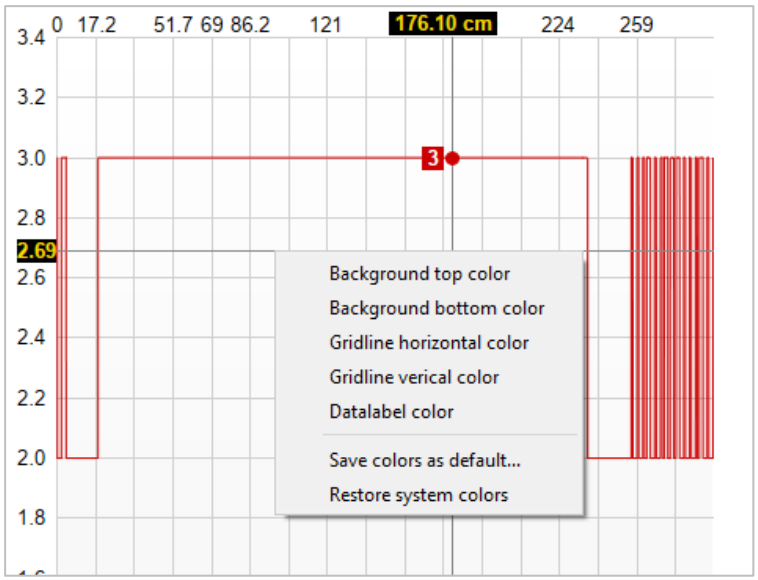


Figure 21: plots context menu in dat explorer view with right click on plot area

Right click on plot provides the context menu to change color theme of the plots (Figure 21).

9. Properties Explorer

This window provides the properties of the sensor that is selected from the measurement explorer. These properties changes depending on the sensors, for example sensor calibration details are seen in Figure 22. A property can be a read only or writable. The values of the writable property can be changed and upon change of the property respective command will be sent out to the sensor that is connected to the demo board.

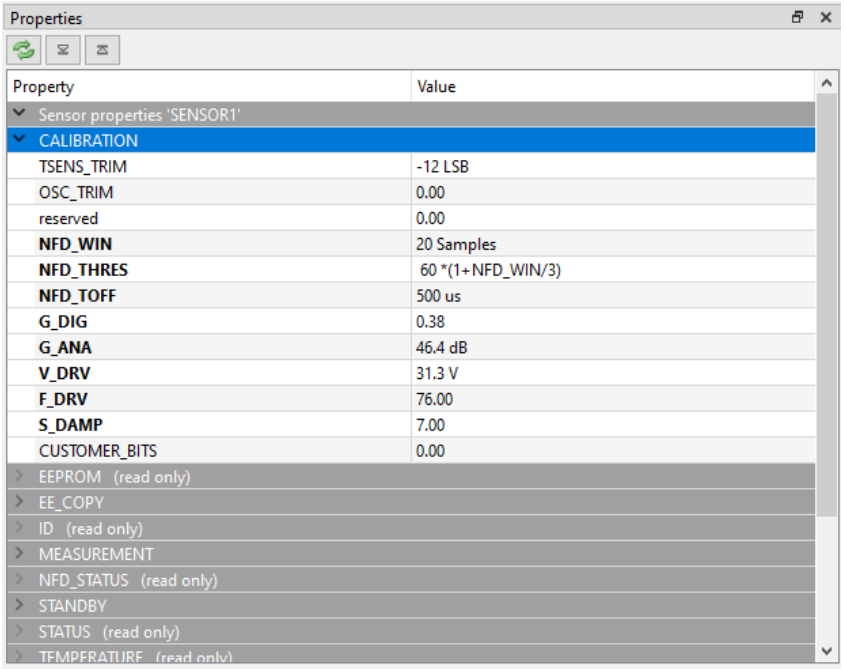


Figure 22: Property Explorer with listed properties

10. Terminal

The below Figure 23 depicts the terminal windows together with terminal logging and different terminal options as listed below.

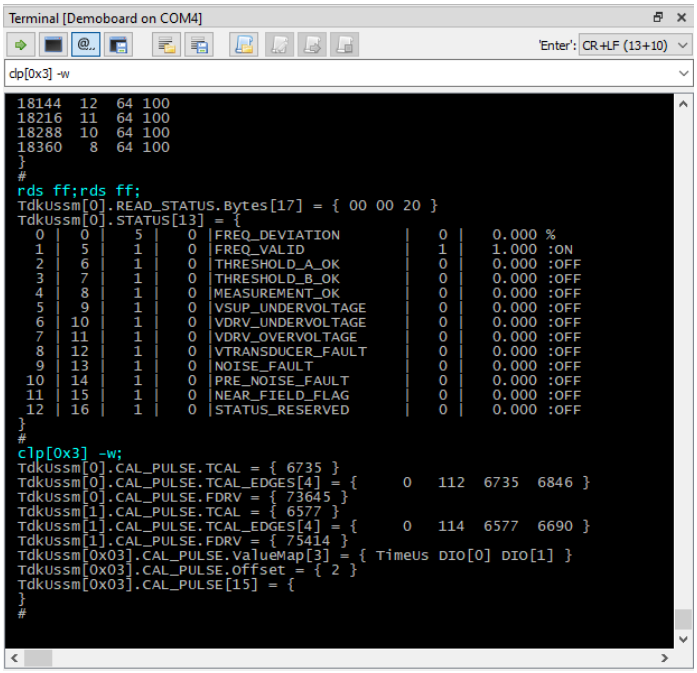


Figure 23: Teminal Window view

- Ssend commands to device.
- Clears the terminal output.
- Prepends command character.
- Log to the file. when clicked on check box all sent commands are saved in log file.
- Load history from the file.
- Save history to the file.
- Load script.
- Edit the script.
- Run the Script.
- Stop the Script from running.

The Textbox between terminal options tab and console output view provides the user to enter commands to send directly to the board. Make sure that the board is slected in the channel explorer as in Figure 24 otherwise commands wont' be send to the board.

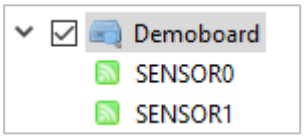


Figure 24: Example -selection of demo board from channel explorer.

Terminal view also provides the features to select the desired script file to edit/run the commands. A context menu is appeared upon the mouse click on the terminal output to choose different options as provided in Figure 25.

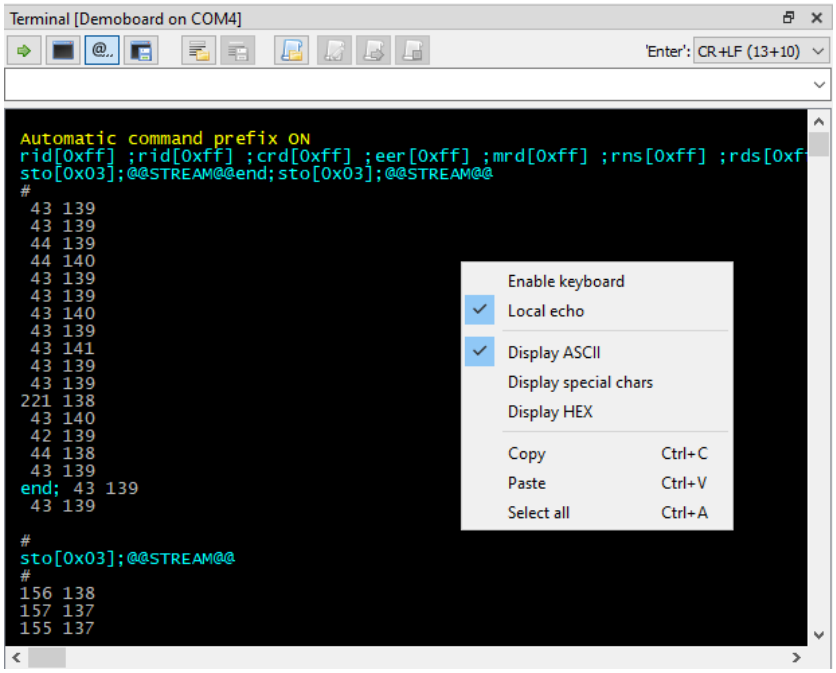


Figure 25: context menu with right click in terminal logging

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