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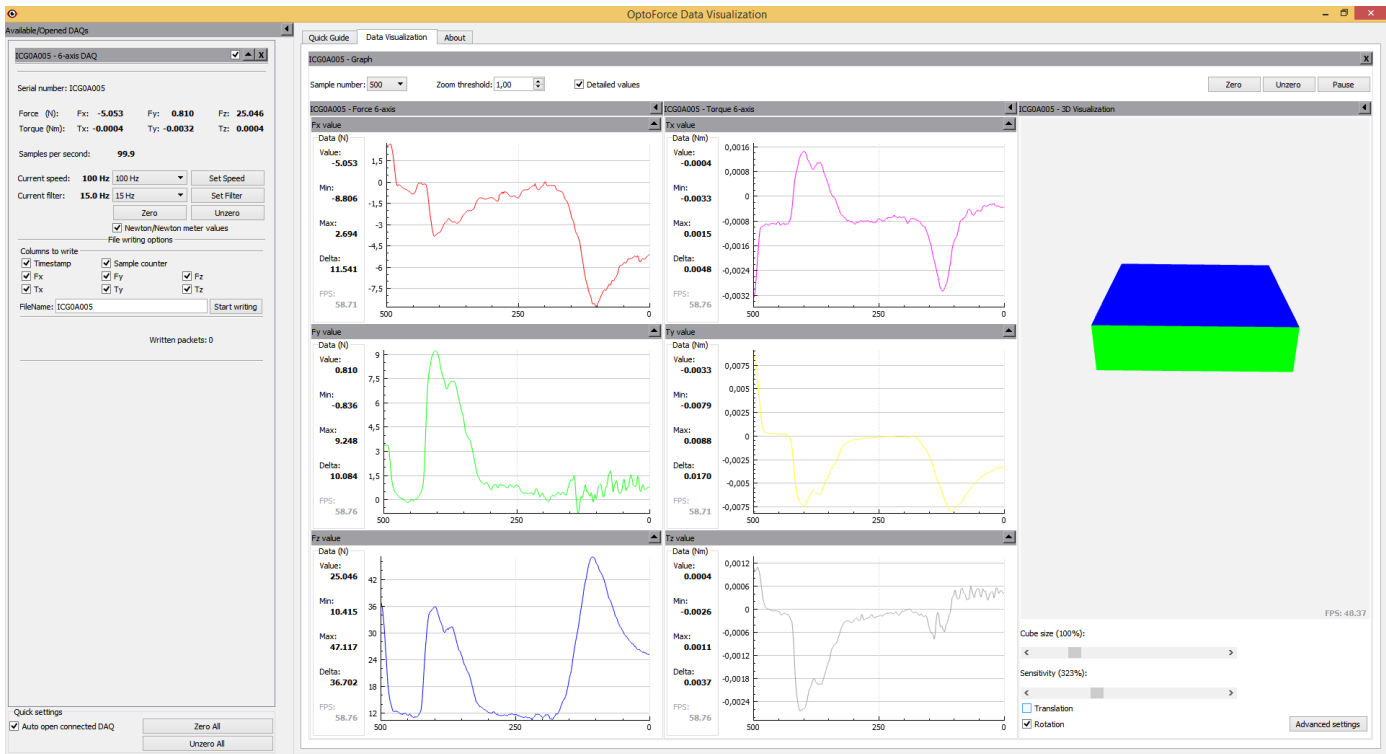
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USER GUIDE - ODV – Document Version: 1.0



BENEFITS

- Analog data visualization
- Force vector representation
- 2D and 3D plot
- Data Logging
- Easy to use

SYSTEM REQUIREMENTS

CPU: Intel Core i5 (or equivalent)

RAM: 2GB

Operating systems:

- Windows 7/8/10
- Linux (64 bit, Tested on Ubuntu 16.04)
- OpenGL 3.3 or greater

HDD space: 500 MB



USER GUIDE - ODV

STARTING THE APPLICATION (WINDOWS)

- After installation, you can find the link of the program on your desktop
- You may need to start the application as administrator (right click on the icon and choose „**Run as Administrator**“) in order to use the recording to file function

STARTING THE APPLICATION (LINUX)

- After unpacking the archive, you need to go through these steps:
 1. Open a new Terminal
 2. Change directory where you unpacked the application
 3. Start the application: `sudo ./ODV2`
 4. If you do not want to start the application with **sudo** all the time, you need to use the following command:

```
sudo usermod -a -G dialout $USER
```

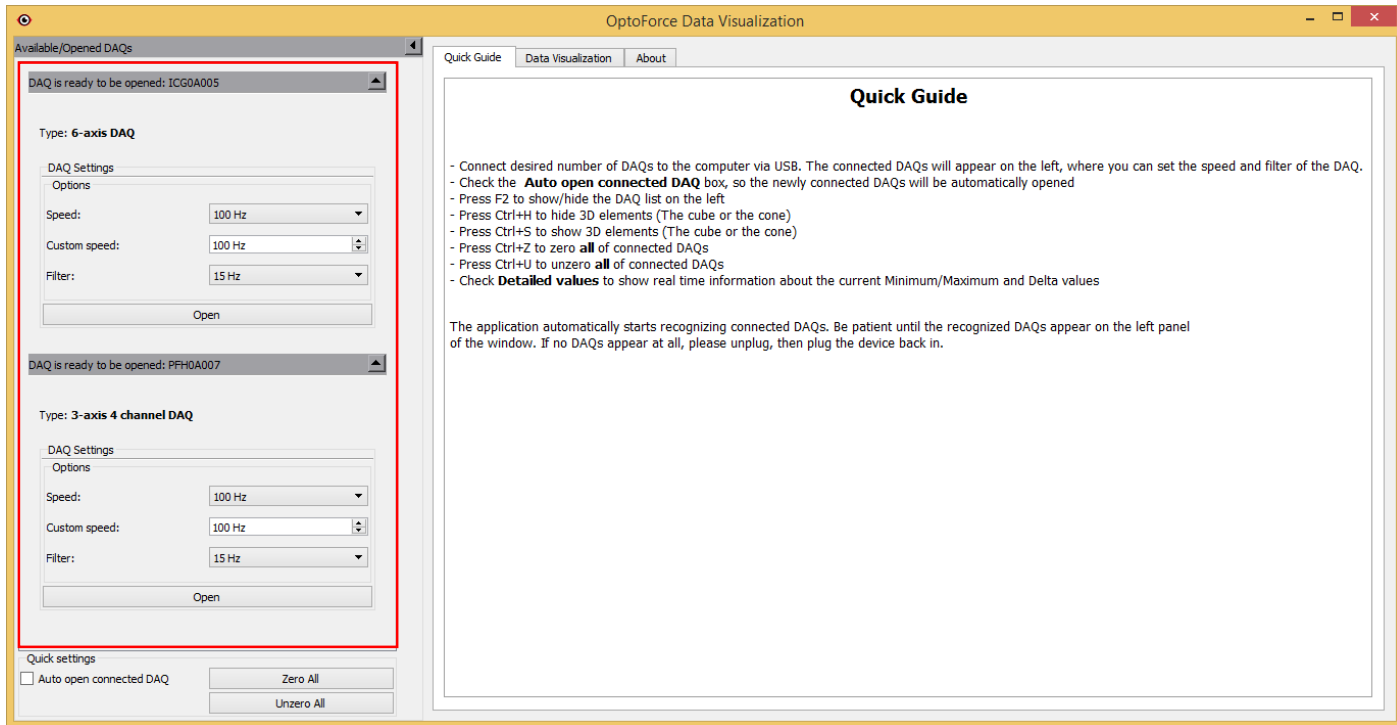
Do a logout/login to apply the setting.

5. If **libcui18n.so.52** is not found on your system, please download it from <http://packages.ubuntu.com/trusty/amd64/libicu52/download> and install with the following command:

```
dpkg -i libcui52_52.13ubuntu0.4_amd64.deb
```



DAQ Opening Settings



Main Features

- Before opening a DAQ, speed and filter options can be set here
- Custom speed can be set (eg. 111 Hz, 142 Hz, 166 Hz, etc)



DAQ Opening Settings

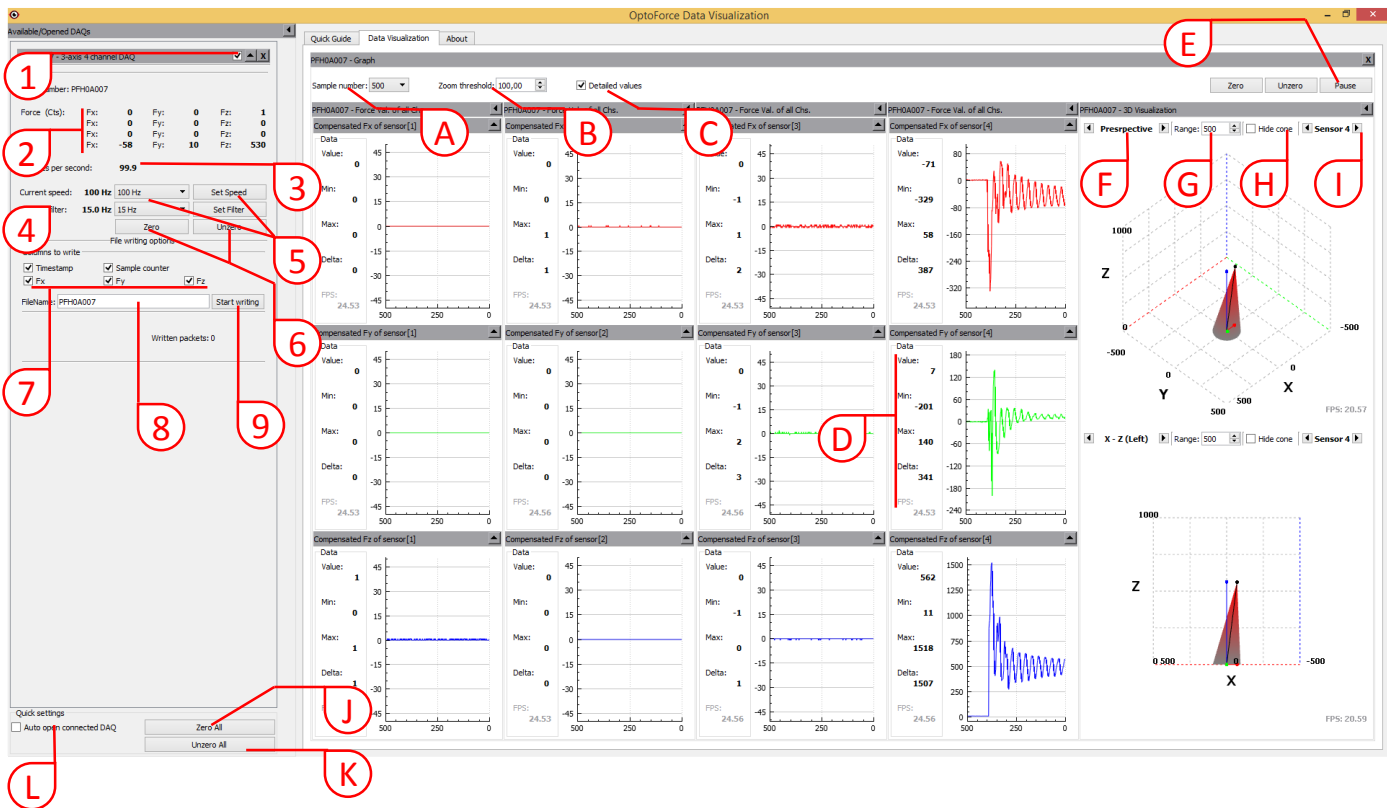
The screenshot shows the 'OptoForce Data Visualization' application window. On the left, under 'Available/Opened DAQs', there are two DAQ entries. The first is 'ICG0A005' (6-axis DAQ) and the second is 'PFH0A007' (3-axis 4 channel DAQ). Each entry has a 'DAQ Settings' section with 'Options' for 'Speed' and 'Filter', and an 'Open' button. A 'Quick Guide' window is open on the right, providing instructions for connecting and opening DAQs. Red circles with numbers 1 through 6 are overlaid on the interface, pointing to specific elements: 1 points to the DAQ ID, 2 to the 'auto open connected DAQ' checkbox, 3 to the 'Speed' dropdown, 4 to the 'Filter' dropdown, 5 to the 'Open' button, and 6 to the 'Quick Guide' text.

1. The Serial Number of the DAQ which is connected to the computer
2. The type of the DAQ (3-axis 1 channel, 3-axis 4 channel, 6-axis).
3. The preset speeds which can be selected.
4. Custom speed but not any speed can be set though. The closest speed supported by the DAQ will be calculated by an internal formula after you set your desired speed.
5. The preset filterings which can be selected.
6. Open the DAQ. The set speed and filter settings will be used.

Note: Any number and type of DAQs can be connected to the application.



Using the application (with 3-axis sensor)



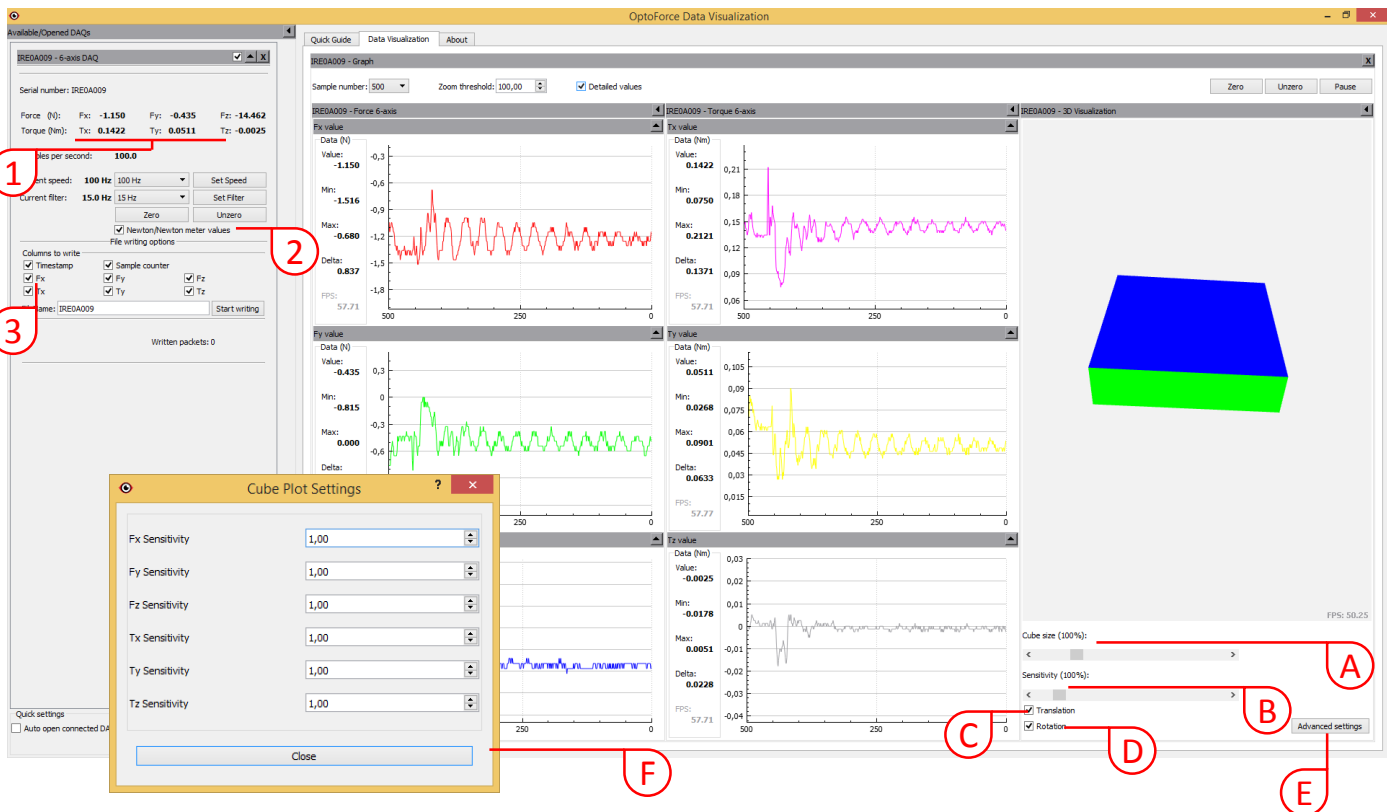
- 1) Check or uncheck this box to hide or show the visualisation of the given DAQ. This is more important when you have more than one DAQ opened and you want to see another DAQ's visualization in a bigger size.
- 2) The actual Fx, Fy, Fz force values of the given sensors. In the case of one channel DAQ only one row of values will be shown.
- 3) The current samples per second calculated by the count of incoming packets
- 4) The current speed and filter of the given DAQ.
- 5) The speed and filter settings can be modified by these items. Note: If you want to modify one of these settings you have to click on the appropriate button („Set Speed” or „Set Filter”) to send the configuration.
- 6) Zero or Unzero the given DAQ. ‚Zero’ will set each sensor’s signal to zero. ‚Unzero’ will set signals to default value.
- 7) Checking or unchecking these boxes will set the content of written file. Each box represents a column in a file. **Fx**, **Fy**, **Fz** boxes are the force values of the sensor, **Timestamp** is an HH:MM:SS.sss format of time where sss are milliseconds, **Sample counter** is the internal packet counter of the DAQ.
- 8) You can set the name of the written file. By default it is set to the serial number of the DAQ. The final form of the filename will be „ABCDEFGH_SENSOR_N_HH_MM_SS.txt” where ABCDEFGH will be the name given by the user, N is the actual sensor (in the case of 4 channel DAQ it can be 1..4), HH_MM_SS is the current time (the time when the given file created).
- 9) Start or stop file writing.

**Using the application (with 3-axis sensor)**

- A. The number of points to be shown on the X-axis of each graph. By default it is 500, maximal size is 10000.
- B. the minimum range of the Y axis can be set on each graph.
- C. By checking this box, detailed values will be shown/hidden on each graph in real-time. (See D.)
- D. These values are the current value, Minimum value, Maximum value and delta of Minimum and Maximum values and FPS (frames per second, the number of redraw of each graph in one second)
- E. Pause or Resume of visualization of given DAQ. (This is a logical pause, so DAQ will not stop broadcasting data and file writing will be continued too)
- F. The type of 3D visualization can be selected here (Perspective, X – Y (Top), Y – Z (Front), X – Z (Left)) by pushing left or right arrowed buttons.
- G. Set the range of X, Y and Z on the 3D visualization.
- H. Show/Hide cone on the 3D visualization. When cone is hidden only force-vectors will be drawn.
- I. One can select the current sensor. (eg. In the case of 4 channel DAQ, one can select Sensor 1, ... Sensor 4 to be visualized)
- J. By clicking this button, every opened DAQ can be zeroed.
- K. By clicking this button, every opened DAQ can be unzeroed.
- L. By checking the box, newly connected DAQs will be automatically opened

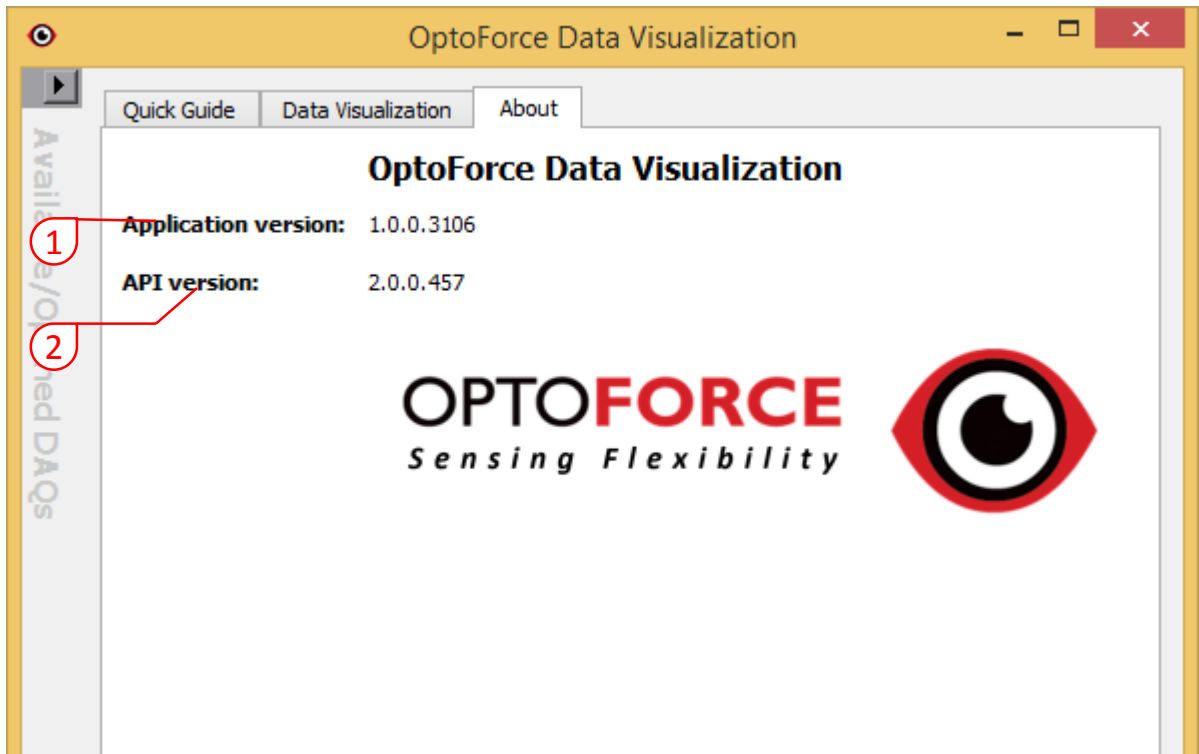


Using the application (with 6-axis sensor)



Only extra cases described here. For example setting the **Zoom threshold**, change the **speed** or **filtering** of the given DAQ and so on are the same as in 3-axis case.

- 1) The actual Fx, Fy and Fz force values and the actual Tx, Ty and Tz torque values of the given sensor. These values can be dimensionless counts or Newton/Newton meter values (See 2.)
- 2) Change between dimensionless counts mode or Newton/Newton meter mode. If the actual DAQ cannot be used in Newton/Newton meter mode, this checkbox is not shown. To use the Newton/Newton meter mode, in some cases you have to copy the provided **OSR** file in the folder where your ODV application has been installed. *Note: After you started writing to file, changing this setting has no effect on the content of the file (if the file writing started in counts mode, it will stay in counts mode until you stop then restart writing)*
- 3) The columns of the file writing supplemented with Tx, Ty and Tz values.
 - A. The size of the „cube” in 3D visualization
 - B. The overall sensitivity of the „cube” in 3D visualization. If set to zero, the cube stays still otherwise the bigger the sensitivity the stronger the rotation and the translation of the cube.
 - C. By unchecking this box, cube will not „move” on the X, Y and Z axes.
 - D. By unchecking this box, cube will not be rotated by the values of Tx, Ty and Tz.
 - E. Clicking on this button will pop up a settings window, where one can change the sensitivity of the „cube” on each axis (Fx, Fy, Fz, Tx, Ty, Tz) (See F)
 - F. This window pops up after pressing button E). Change of a value has immediately effect on the „cube” For example if you want more sensitive moving on X-axis, change the value of Fx to 10,0. If you want to disable moving on X-axis, simply change Fx value to 0,0

**About tab**

- 1) The version of the Application
- 2) The version of the API

Please always provide those informations when you found a bug or have any question about the application!



Modifying settings.ini

The application is shipped with configuration file „**settings.ini**” This file can be modified by the end-user so this guide will describe the modifiable values and the effects of modifications.

[Application] section

Key: „**AutoOpen**”

Values: True or False

Description: if set to true, the application automatically opens any connected DAQs. If false, the DAQs must be opened manually

Key: „**AutoZero**”

Values: True or False

Description: DAQ is auto-zeroed after it has been opened when set to true.

Key: „**DefaultSpeed**”

Values: Any value between 4 and 1000.

Description: This setting has effect only when **AutoOpen** is set to **True**: the automatically opened DAQ's speed will be set to this value.

Key: „**DefaultFilter**”

Values:

0 - No filtering

1 - 500.0 Hz

2 - 150.0 Hz

3 - 50.0 Hz

4 - 15.0 Hz

5 - 5.0 Hz

6 - 1.5 Hz

Description: This setting has effect only when **AutoOpen** is set to **True**: the automatically opened DAQ's filtering will be set to this value.

Key: „**3DPlotEnabled**”

Values: True or False

Description: If set to true, 3D visualizations are enabled („Cone” and „Cube”), otherwise 3D visualizations disabled

Key: „**BaudRate**”

Values: Any valid baudrate (eg. 384000)

Description: This setting only has effect, when DAQ is connected to the computer via UART.



Recorded file format

- The recorded file format is a simple text file, containing the selected columns selected by the user (see page 5. and 7.)
- The recorded files can be found in the „LOGS“ directory (where you started the application)
- Every line is closed by a ,\r' and a ,\n'
- Columns separated by a „,“ (comma)
- Time format is „HH:MM:SS.sss“ Where HH means Hours (00-23), MM means Minutes (00-59), SS means Seconds (00-59) and sss means milliseconds (000-999). The time is represents the time when the application captured the packet.
- Sample Counter is an internal counter of the DAQ. It changes every ms. If the DAQ's speed is set to 1000, increment of the sample counter will be 1, if the speed set to 100, increment of the sample counter will be 10, and so on.
- The created file is in CVS format, thus it makes it suitable and easy to open it even in Excel for further data processes and display.

Example:

TimeStamp,SampleCounter,Fx,Fy,Fz

```
15:54:43.044,39985,-2,-1,0
15:54:43.054,39995,-2,0,0
15:54:43.064,40005,-2,0,0
15:54:43.074,40015,-2,-1,-1
15:54:43.084,40025,-2,-1,0
15:54:43.094,40035,-1,0,0
15:54:43.104,40045,-3,0,0
15:54:43.114,40055,-1,0,0
15:54:43.124,40065,-2,0,-1
15:54:43.134,40075,-2,0,0
```

The speed of the DAQ was 100 Hz here, so SampleCounter values incremented by 10 in every new line.



Hot keys

You can use the following hotkeys in the application:

- **F2** – Hide/Show left panel (list of DAQs) (It is useful when you need a bigger size of visualization panel)
- **Ctrl + H** – Hide 3D visualization elements (the „Cube” or the „Cone”)
- **Ctrl + S** – Show 3D visualization elements (the „Cube” or the „Cone”) *Note: if you modified your **settings.ini** by setting **3DPlotEnabled** to **False**, you cannot use this shortcut to make 3D visualization to be shown!*
- **Ctrl + Z** – Do a zeroing on **all** connected DAQs
- **Ctrl + U** – Do an unzeroing on **all** connected DAQs