OPERATION MANUAL

DIGIVISION
Torque

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1 Symbols used in the operation manual

1.1 Signal words

The following signal words are used in the operation manual according to the specified hazard classification.

DANGER	
High degree of risk: indicates a hazardous situation which, if not avoided, will result in death or serious injury.	
WARNING	
Moderate degree of risk: indicates a hazardous situation which, if not avoided, may result in death or serious injury.	
CAUTION	
Low degree of risk: indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.	
NOTICE	

Note: It is important to heed these safety notices in order to ensure correct handling of the sensors.

IMPORTANT: Follow the information given in the operation manual.

1.2 Pictograms

	Electric shock hazard.
	Observe the advice for protecting the instrument.

2 Introduction

IMPORTANT: Read the operation manual carefully before using the equipment, and keep it for future reference.

2.1 Intended use

The DigiVision software can be used to configure various burster sensors and devices, and to carry out measurements. This operation manual relates exclusively to torque sensors. If using other sensors or devices, please refer to the respective operation manual.

2.2 Customer service

2.2.1 Customer service department

If you have repair inquiries or software problems, please call our customer service department on +49 7224 645-53.

2.2.2 Contact person

If you have any questions, please contact your representative or go directly to burster präzisionsmesstechnik gmbh & co. kg.

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3 Non-rotating torque sensors, model 8625/8630/8631, USB version

3.1 Electrical connection

NOTICE

The USB socket is supplied with a protective dust cap fitted. Before putting the sensor into use, this cap must be levered off, without damaging it. It is not meant to be cut off!

This is how it works

1. Take the cap off the USB socket.

2. Connect the torque sensor to a computer using the supplied USB cable.
3. Please be sure to follow the instructions in section 3.2 Power supply on page 7.

3.2 Power supply

The device draws 200 mA from the USB port. Usually this is not a problem for desktop PCs.

For laptops, however, several USB ports may share one power supply that is additionally loaded by other connected USB devices (mouse etc.) Therefore, under some circumstances, the torque sensor may be supplied with too little power and cannot register its presence. In this case, you need to connect the torque sensor to the laptop via an active USB hub.

3.3 Connector pin-out

The USB interface complies with the USB 2.0 standard and the pin assignment is as usual. The built-in connector on the torque sensor is for a “Micro USB” plug.

Pin	Name
1	+5 V
2	Data -
3	Data +
4	ID (not used)
5	GND

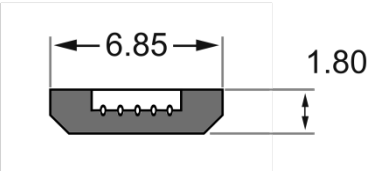


Figure 1: Micro USB [mm]

The connector fitted on the supplied cable is a “USB Type A” plug.

Pin	Name

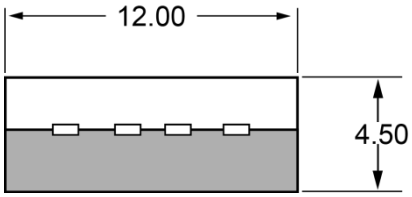


Figure 2: USB A [mm]

3.4 Ground connection

The common ground connection “Digital Ground GND” is shared by:

- USB plug casing
- Shield
- Sensor housing
- Protective ground

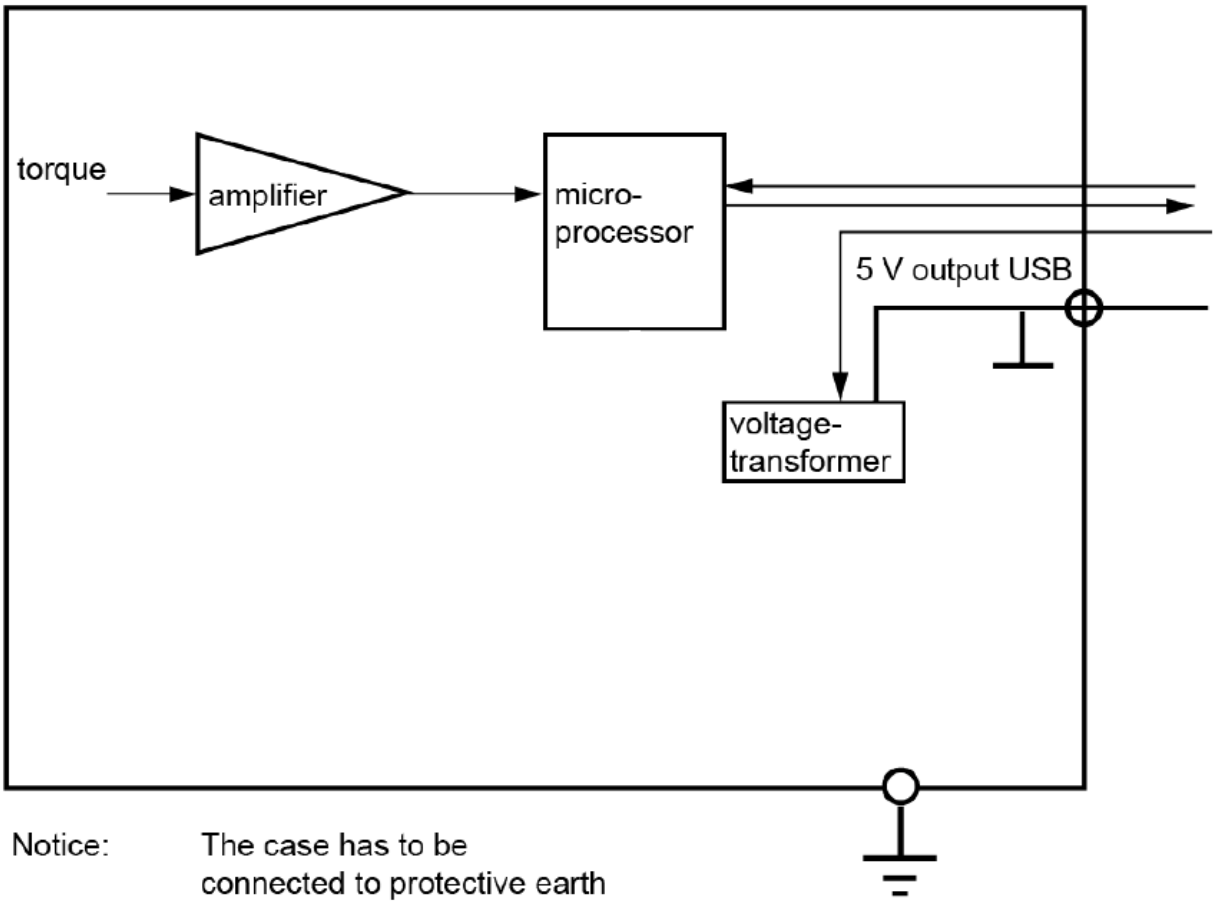


Figure 3: Ground connection

3.5 Running cables

In general the following applies:

- The torque sensor must be grounded via its mounting screws.
- The USB cable length should not exceed 2 m. For longer cables it may be necessary to connect an active USB hub in the cable link to avoid losing the USB connection.

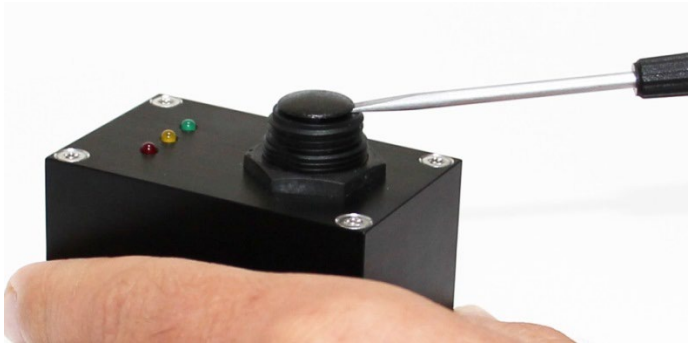
4 Rotating torque sensors, model 8655/8656/8661, USB version

4.1 Electrical connection

The USB socket is supplied with a protective dust cap fitted. Before putting the sensor into use, this cap must be levered off with a suitable tool, without damaging it. It is not meant to be cut off!

This is how it works

1. Carefully prise off the protective cap using a pointed tool.



2. Take the cap off the USB socket.

3. Connect the torque sensor to a computer using the supplied USB cable.
4. Please be sure to follow the instructions in section 3.2 Power supply on page 7.
5. The torque sensor goes through a self-test mode lasting 4 seconds after power-up. Once the self-test has finished, all the LEDs – if fitted – light up solidly for about 1 s. Then the sensor is ready for operation.

4.2 Power supply

After the torque sensor is connected to the USB port, the sensor identifies itself as a “high power device”. In this case, the device draws 495 mA from the USB port. Usually this is not a problem for desktop PCs.

For laptops, however, several USB ports may share one power supply that is additionally loaded by other connected USB devices (mouse etc.) Therefore, under some circumstances, the torque sensor may be supplied with too little power and cannot register its presence. In this case, you need to connect the torque sensor to the laptop via an active USB hub.

Note: The actual power consumption is: P = 5 V * 0.35 A = 1.75 VA.

4.3 Connector pin-out

The USB interface complies with the USB 2.0 standard and the pin assignment is as usual. The built-in connector on the torque sensor is a “USB Mini B” plug.

Pin	Name
1	+5 V
2	Data -
3	Data +
4	ID (not used)
5	GND

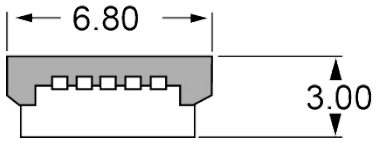


Figure 4: USB Mini B [mm]

The connector fitted on the supplied cable is a “USB Type A” plug.

Pin	Name
1	+5 V
2	Data -
3	Data +
4	GND

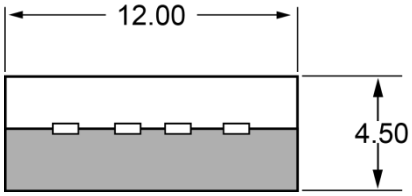


Figure 5: USB A [mm]

4.4 Ground connection

The common ground connection “Digital Ground GND” is shared by:

- USB plug casing
- Shield
- Sensor housing
- Protective ground

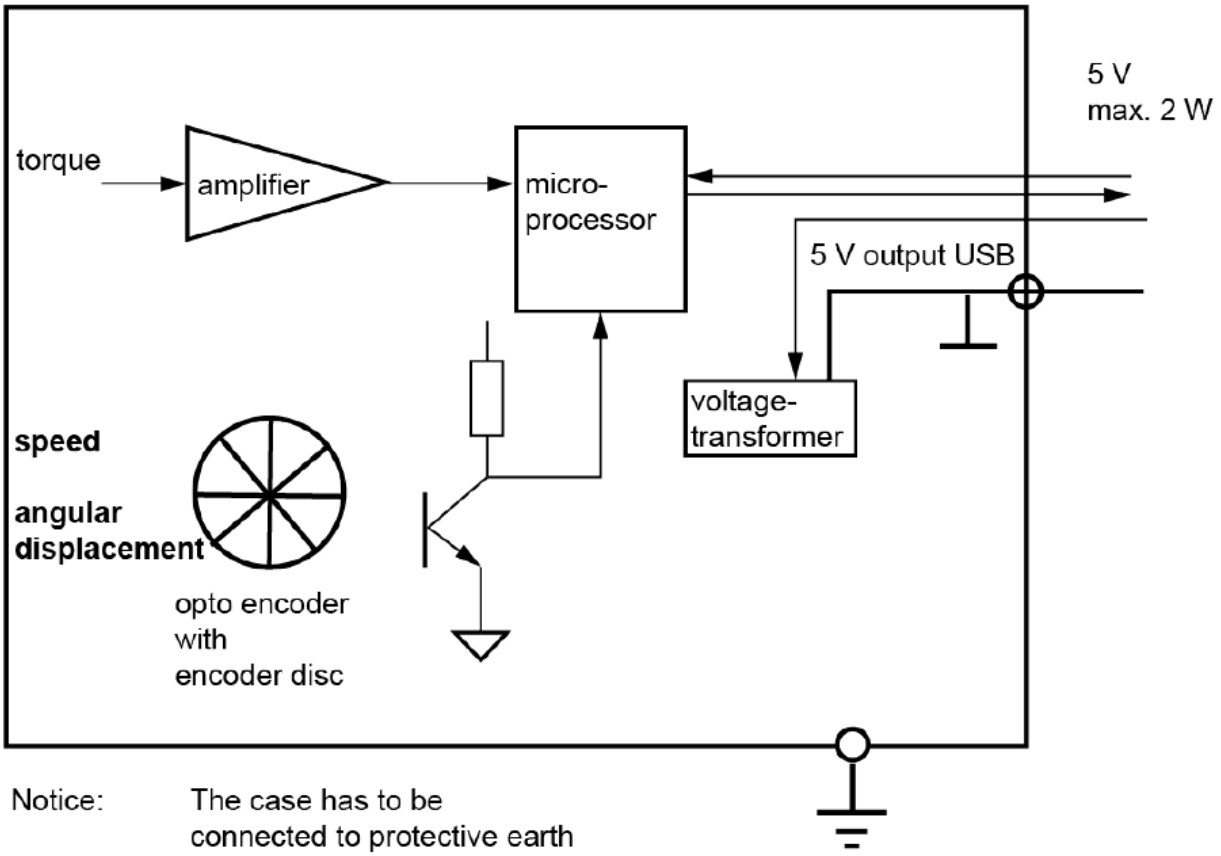


Figure 6: Ground connection

4.5 Running cables

In general the following applies:

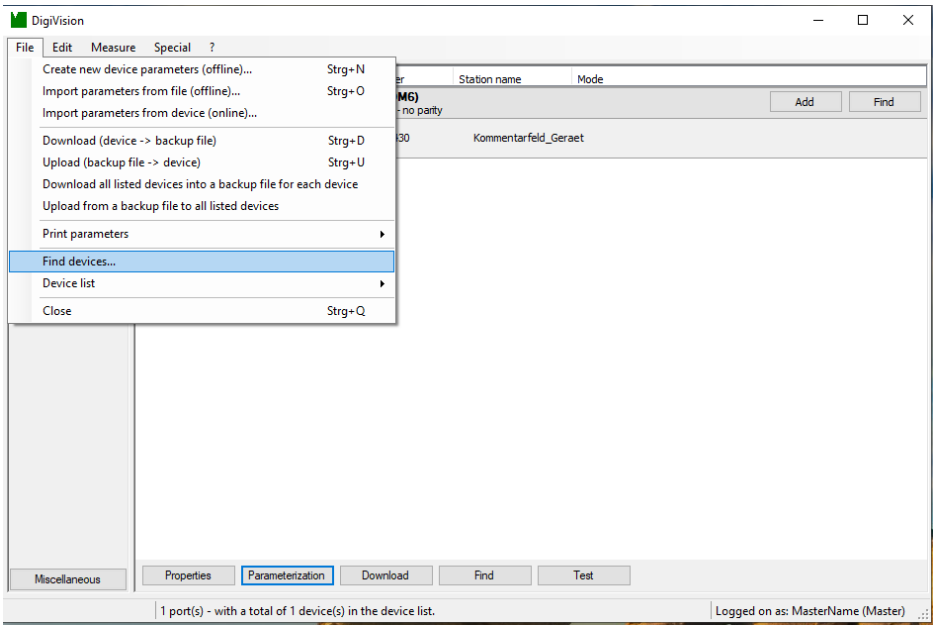
- The torque sensor must be grounded via its mounting screws.
- The USB cable length should not exceed 2 m. For longer cables it may be necessary to connect an active USB hub in the cable link to avoid losing the USB connection.

5 DigiVision software

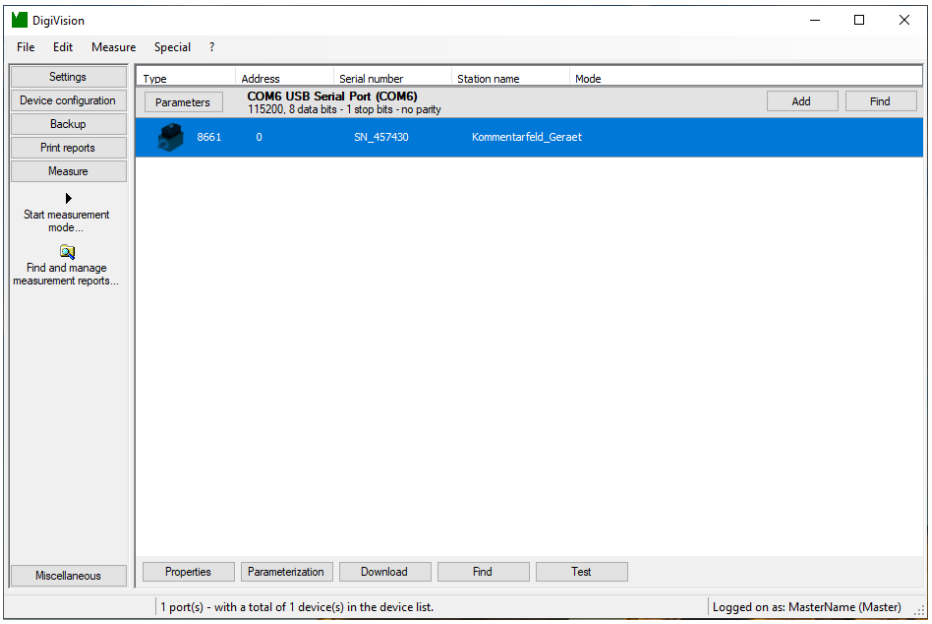
5.1 Device list / Device detection

This is how it works

1. Open DigiVision.
2. Go to “File” > “Find devices…”.



3. As soon as the torque sensor has been detected, it is displayed under the associated port.

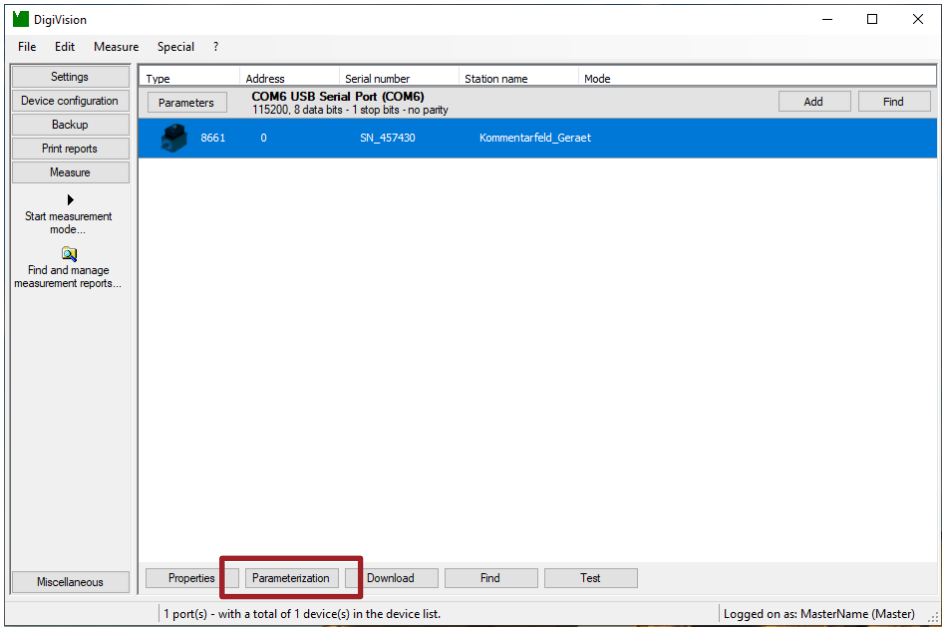


5.2 Device settings

You can access the “Device settings” menu from the DigiVision device list.

This is how it works

1. Open the device list in DigiVision.
2. Select the torque sensor and click “Parameterization”.



3. You can now configure the sensor-specific settings.

5.3 Setup

5.3.1 Setting up rotating sensors

On the “Settings” tab, you can specify the units and conversion factors to be used for the relevant measurement channels. Units suitable for the measured variable should be selected, otherwise errors may occur when displaying the measured value and in its interpretation.

With “Number of Averages” you can set the number of individual measured values to be used to form an arithmetic mean. The value can be set in the range N = 1 to N = 20. When N = 1, averaging is not performed. In this case, the value at the output is refreshed every 10 µs. This corresponds to 100 000 digitizations per second. So if you select N = 20, for example, then a measuring time of 200 µs is needed for a new value at the output (20 x 10 = 200 µs). The averaging has a direct effect on the measured values per second. The higher the averaging value, the fewer measured values per second are possible.

If the torque sensor includes the speed/angle measurement option, you can switch between these two measurement modes on this tab.

If the torque sensor is the optional dual-range version, you can also select the required measurement range here. Applying the settings saves them in the sensor.

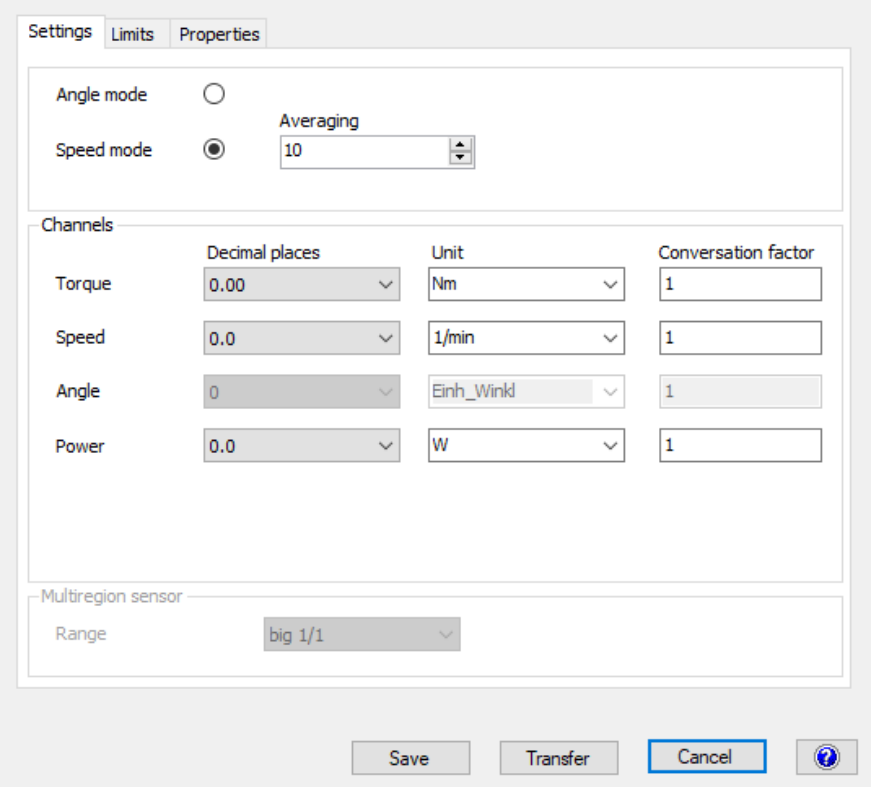


Figure 7: Settings for rotating sensors

5.3.2 Setting up non-rotating sensors

On the “Settings” tab, you can specify the units and conversion factors to be used for the relevant measurement channels. It is important to select units that make sense and are suitable for the measured variables, otherwise errors may occur when displaying the measured value.

With “Number of Averages” you can set the number of individual measured values to be used to form an arithmetic mean. The value can be set in the range N = 1 to N = 50 000. When N = 1, averaging is not performed. In this case, the voltage value at the output is refreshed every 10 µs. This corresponds to 100 000 digitizations per second. So if you select N = 50 000, for example, then a measuring time of 5 seconds is needed for a new voltage value at the output (50 000 x 10 = 0,5 s). The averaging has a direct effect on the measured values per second. The higher the averaging value, the fewer measured values per second are possible.

Disable the low-pass filter if you set a value N ≠ 1.

Filter settings: Set the averaging value to N = 1 if you select a cut-off frequency ≠ OFF.

The low-pass filter is a digital filter designed as a first-order low-pass filter.

Apart from the “OFF” setting, you can select various cut-off frequencies. The cut-off frequency is the frequency at which the output signal is attenuated by -3 dB, corresponding to about 70.7 % of the signal at very low frequencies.

If the torque sensor is the optional dual-range version, you can also select the required measurement range here, or activate switching by a voltage level.

Applying the settings saves them in the sensor.

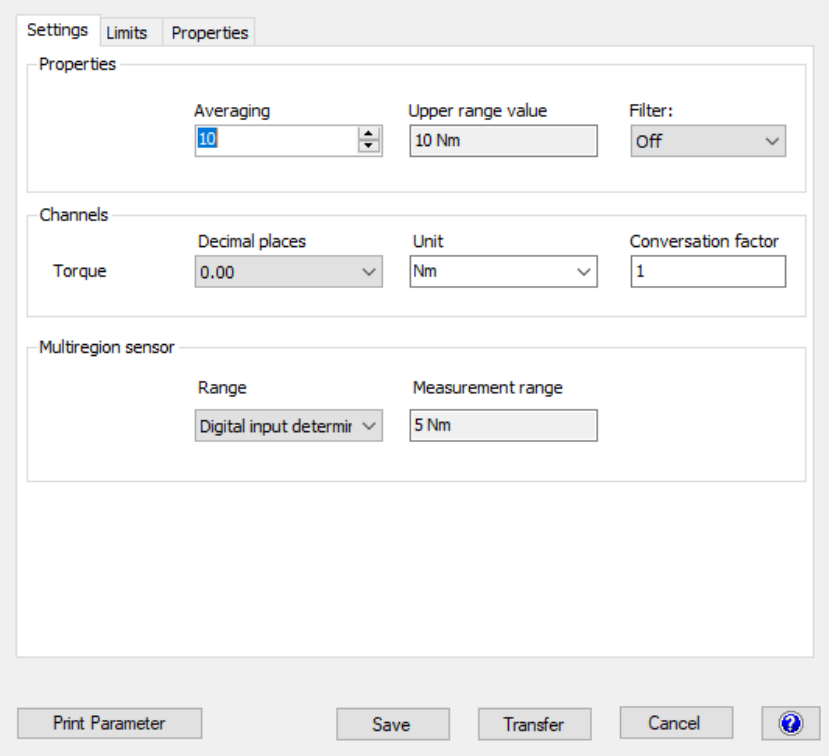


Figure 8: Settings for non-rotating sensors

5.4 Limits

The “Limits” tab is where you can set the sensor limits you require. Select the level for the limit, the channel reference for this limit and whether you wish to monitor the measurement signal for ≥ or ≤.

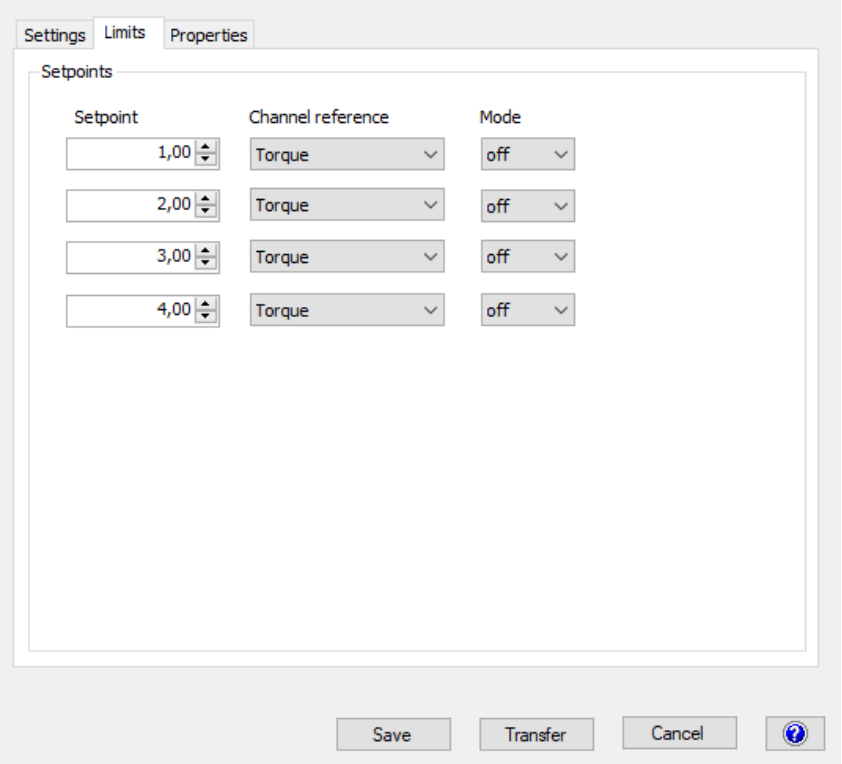


Figure 9: Limits

5.5 Properties

The “Properties” tab contains information about the torque sensor being used. This is where you can find the software version, device type, serial number, device option and calibration date. You can also add comments for documentation purposes.

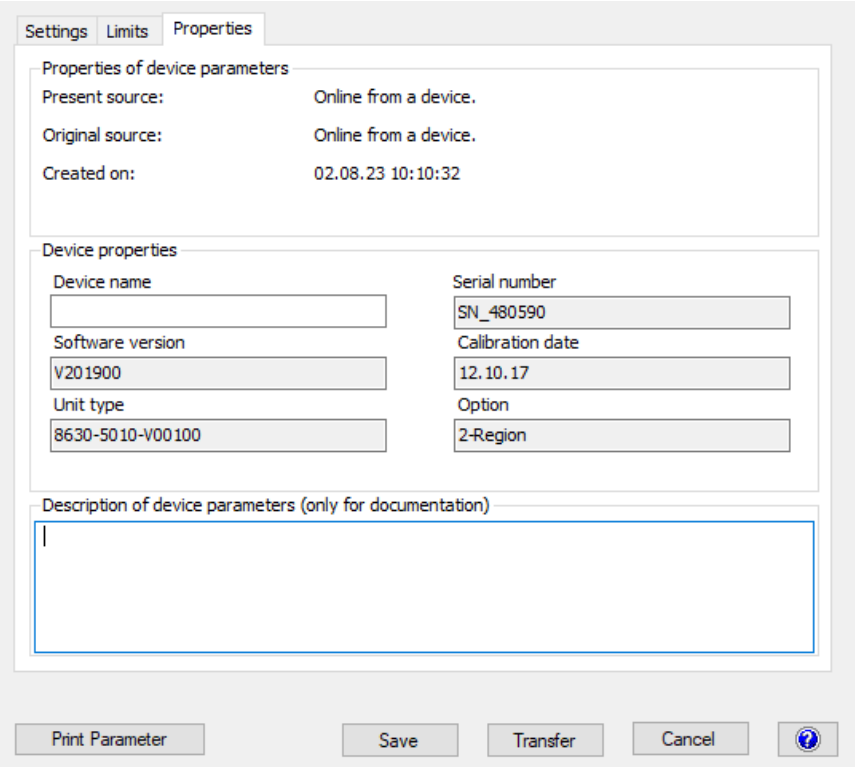


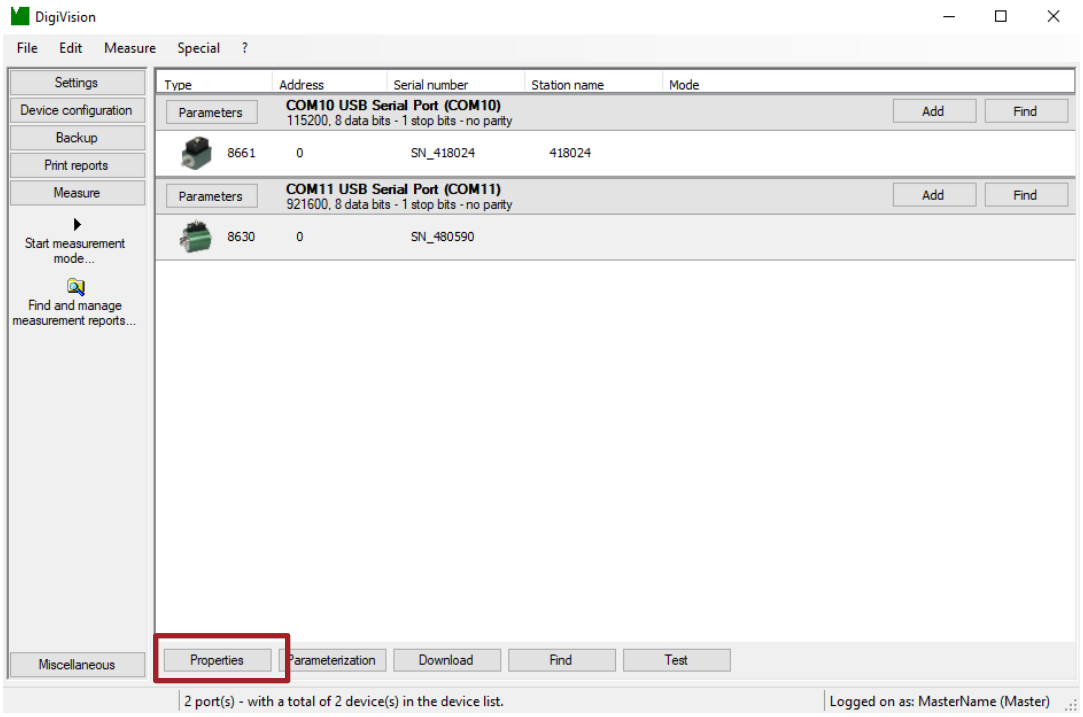
Figure 10: Properties

6 Properties, measurement rate etc.

You can use the “Properties” button to make additional general settings. For instance you can set the measurement rate for the torque sensor here.

This is how it works

1. Open the device list in DigiVision.
2. Select the torque sensor and click “Properties”.



3. You can now configure additional general settings.

6.1 General settings

The “General information” tab contains general information about the torque sensor being used. You can also enter a station name for the torque sensor, i.e. a name identifying the device.

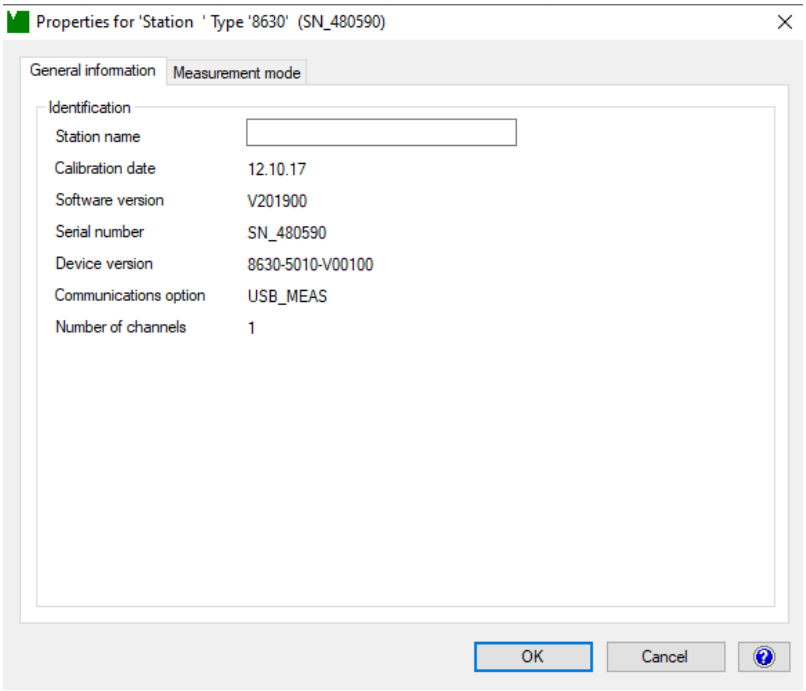


Figure 11: General settings

6.2 Measurement mode and data acquisition

Different measurement rates (sampling rates) can be selected. The maximum number of measurements/second is determined by the number of averages and the license.

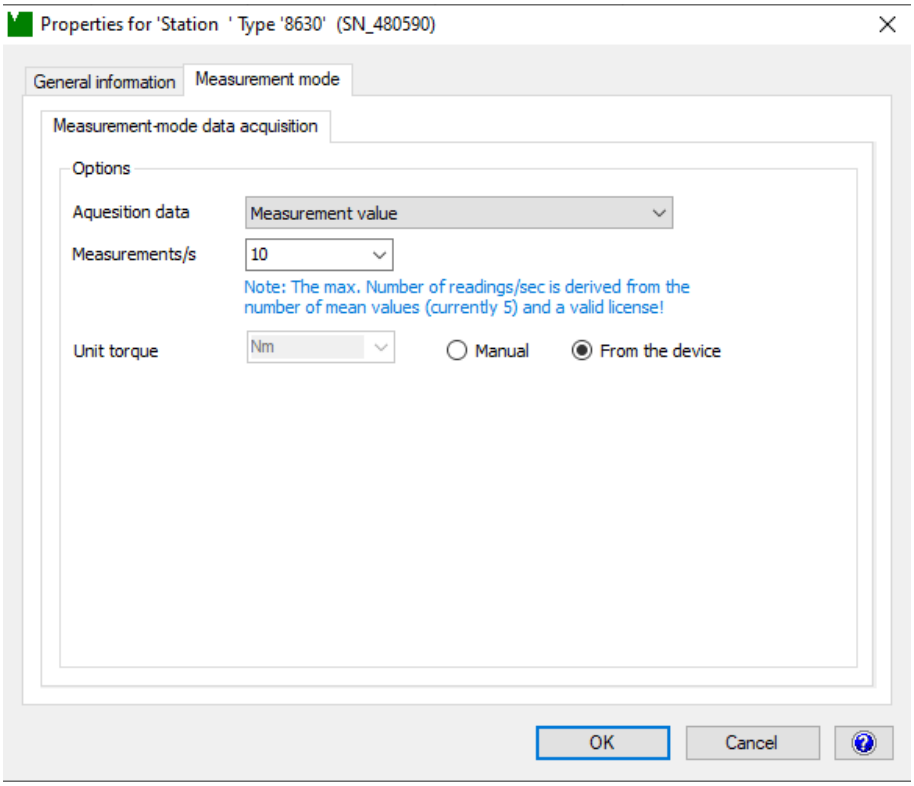


Figure 12: Measurement mode data acquisition for non-rotating sensors

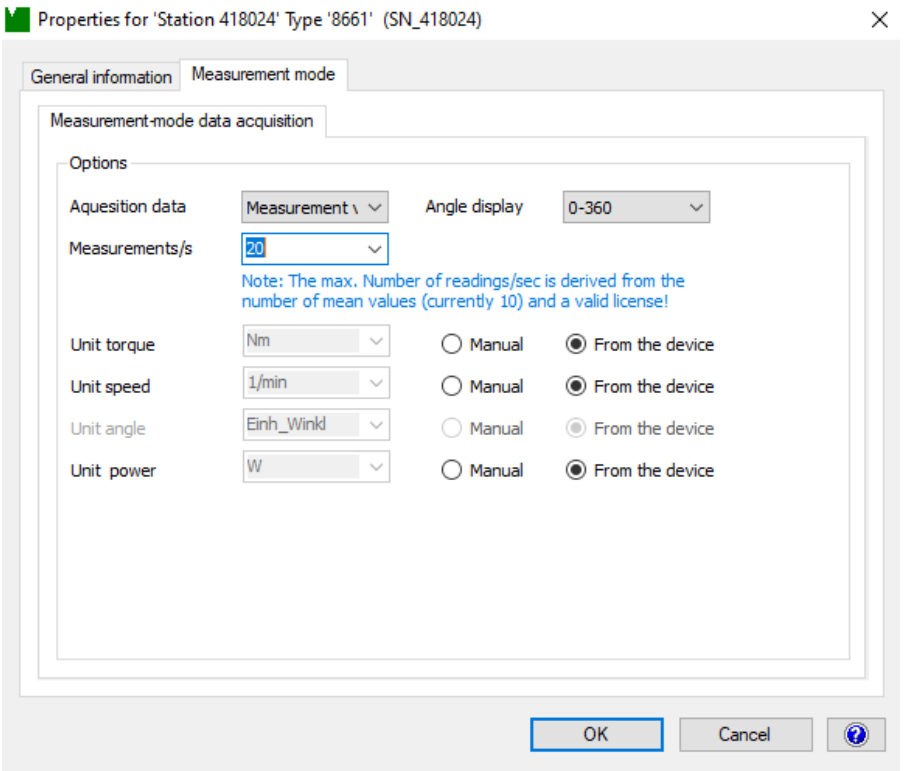


Figure 13: Selecting the measurement rate and acquisition mode for rotating sensors

Two different acquisition modes are available. Different measurement rates (sampling rates) can be selected depending on the acquisition mode.

Normal

Measurement rates of between 0.1 and 20 measurements per second are possible here.

SPOM (Speed optimized POlling Mode), only available with model 8661

Measurement rates of between 0.1 and 1000 measurements per second are possible here.

Angle display (only available with rotating sensors)

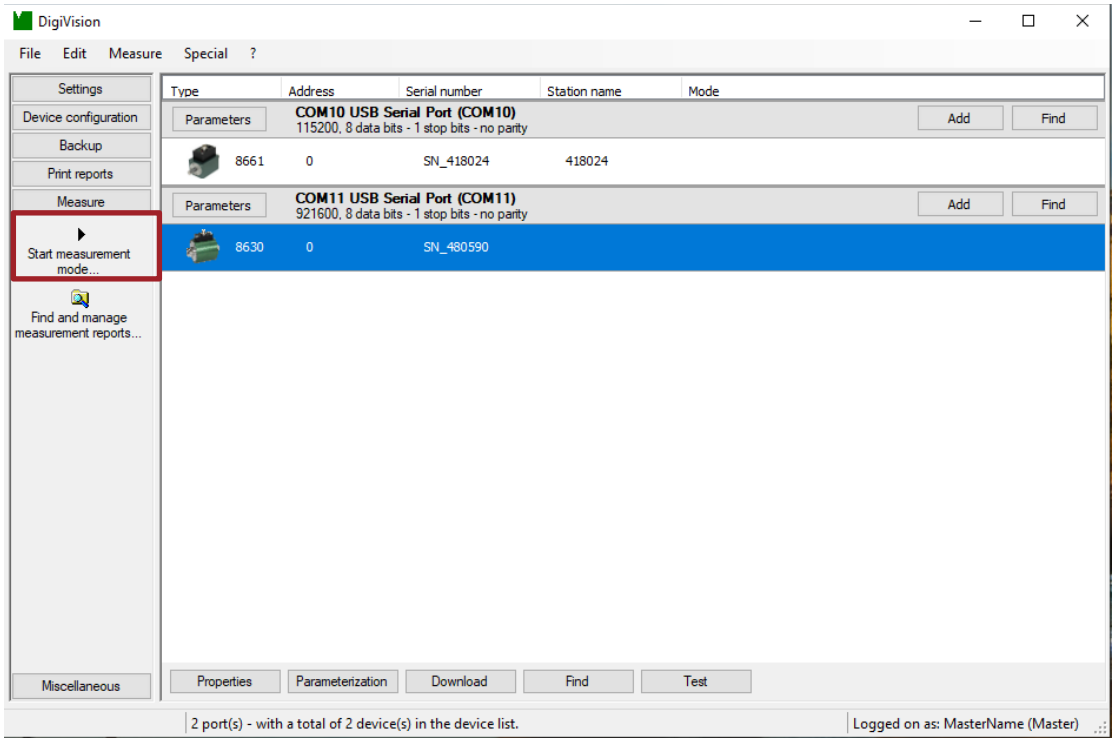
The “Measurement mode” tab also lets you set how you want to display the (optional) angle reading: from 0 to 360° or continuously without limit.

6.3 Measurement mode settings

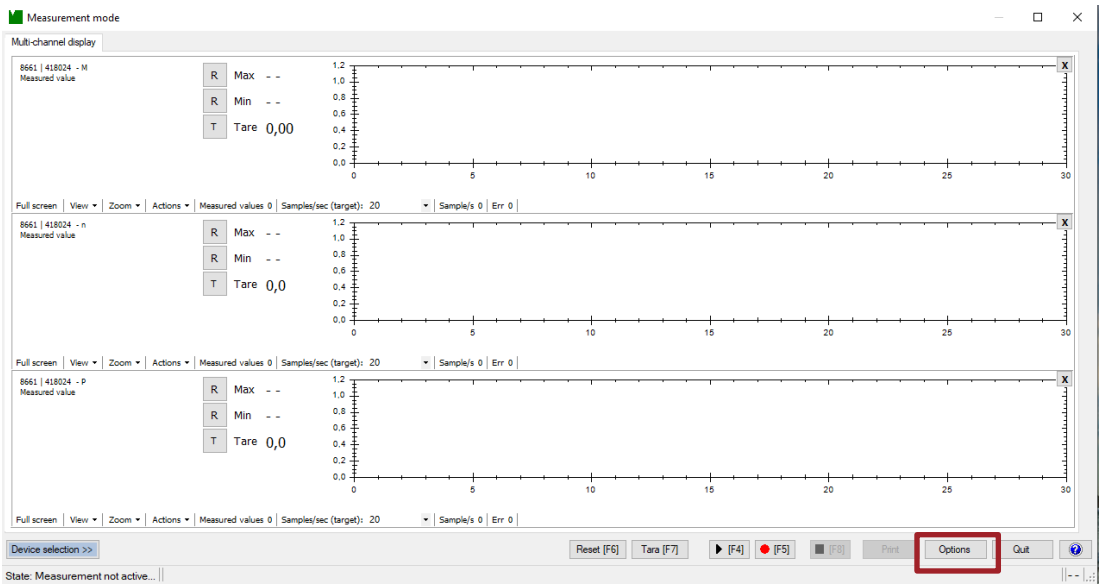
In DigiVision, numerous different settings can be made for the measurements. You can access the Settings menu directly from the “Measurement mode” function.

This is how it works

1. Open DigiVision.
2. Select the “Start measurement mode …” item in the device overview.



3. Press the “Options” button. This opens the “Basic configuration” window.



6.4 Basic configuration

On the “Basic configuration” tab, you can specify how many channels you wish to display. You can also make various settings here for the display and presentation of the measurement curve.

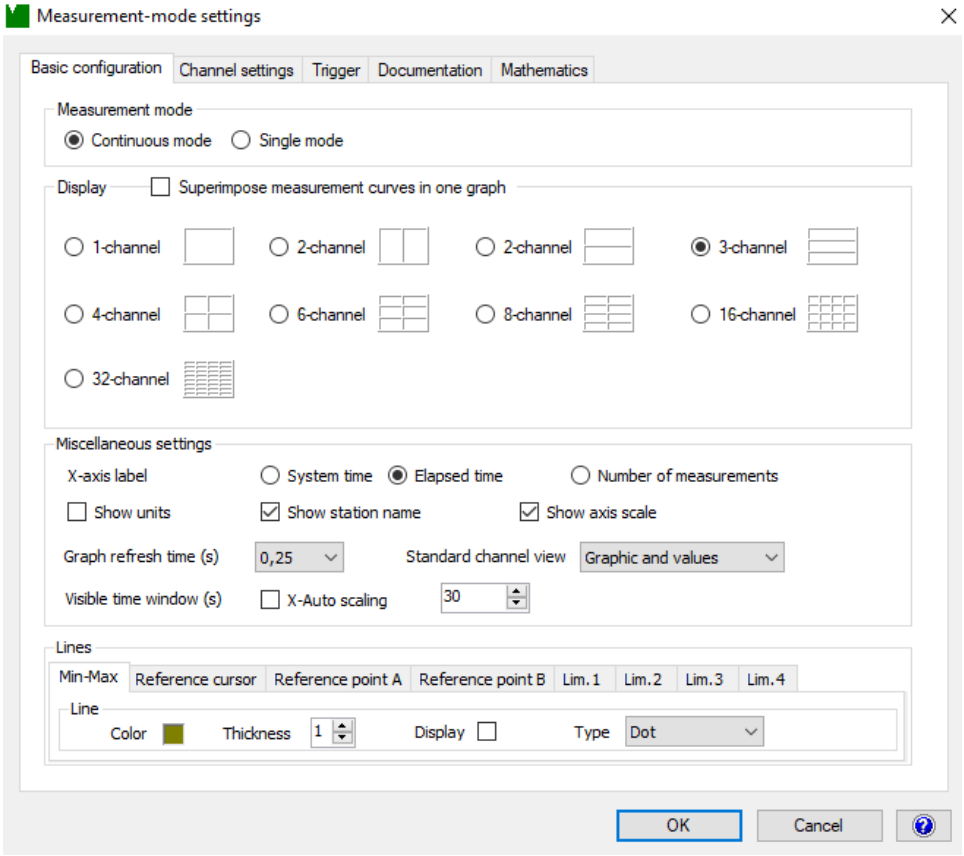


Figure 14: Basic configuration

6.5 Channel settings

The “Channel settings” tab is where you can set specific parameters for each measurement channel.

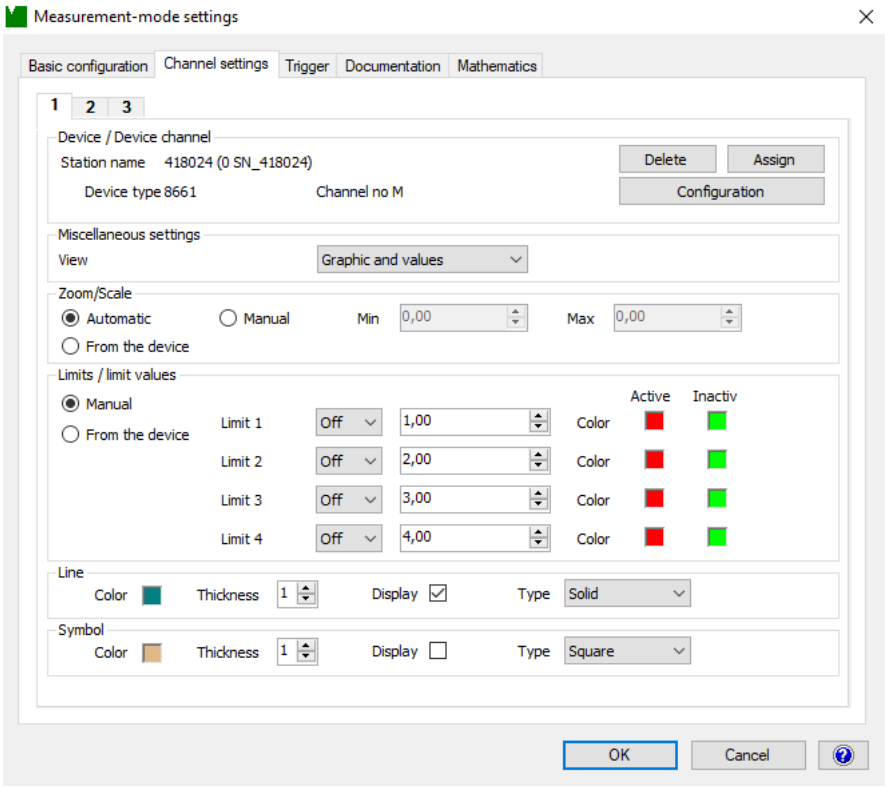


Figure 15: Channel settings

The default setting is to adopt the parameters from the torque sensor, although you can also make manual changes to any parameter. Here you can also define the limits, measurement curve colors and the colors and shapes of the symbols that can be shown in the graphs. You have to make these settings separately for each measurement channel.

6.6 Trigger

Measurement can also be stopped using a trigger with a suitable stop condition.

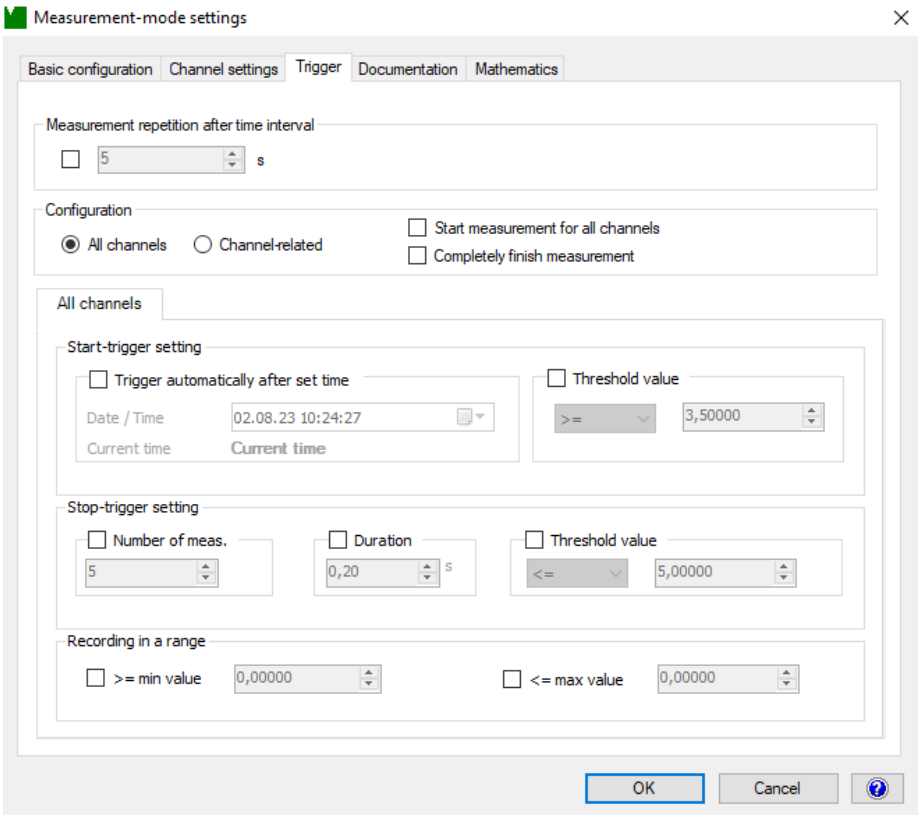


Figure 16: Trigger settings

6.6.1 Repeat measurement after time interval

You can use the “Repeat measurement after time interval” setting to specify a time interval after which a repeat measurement shall take place following the end of a measurement process. You can configure the settings to apply to all channels or each channel individually.

6.6.2 Start-trigger setting

Here you can define the start condition.

6.6.3 Stop-trigger setting

Here you can define the stop condition.

6.6.4 Recording in a range

You can use this setting to specify the range of values within which a measurement shall take place.

6.7 Documentation

Various documentation settings are available here. For instance you can define various counter settings, which can be common to all channels or apply to specific channels. You can also enable/disable the documentation setting.

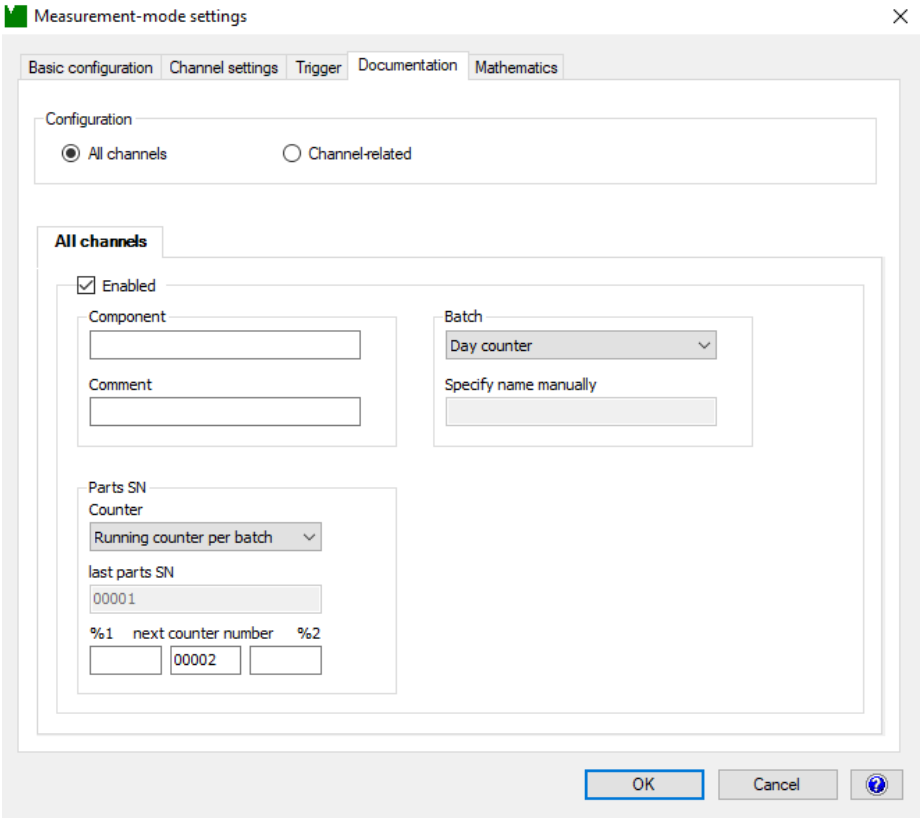


Figure 17: Documentation settings

6.8 Display

The measurement curves are displayed in a line graph separately for each measurement channel. The measured values are plotted against measurement time in this graph.

You have various zoom and display options available to gain a better view. For instance you can show/hide measurement channels.

Maximum and minimum values (Max, Min) are shown in the area to the left of the graph. You can reset these values using the “R” buttons.

The “T” button tares the current value; the tare value is displayed next to the button. Pressing the button again clears the value.

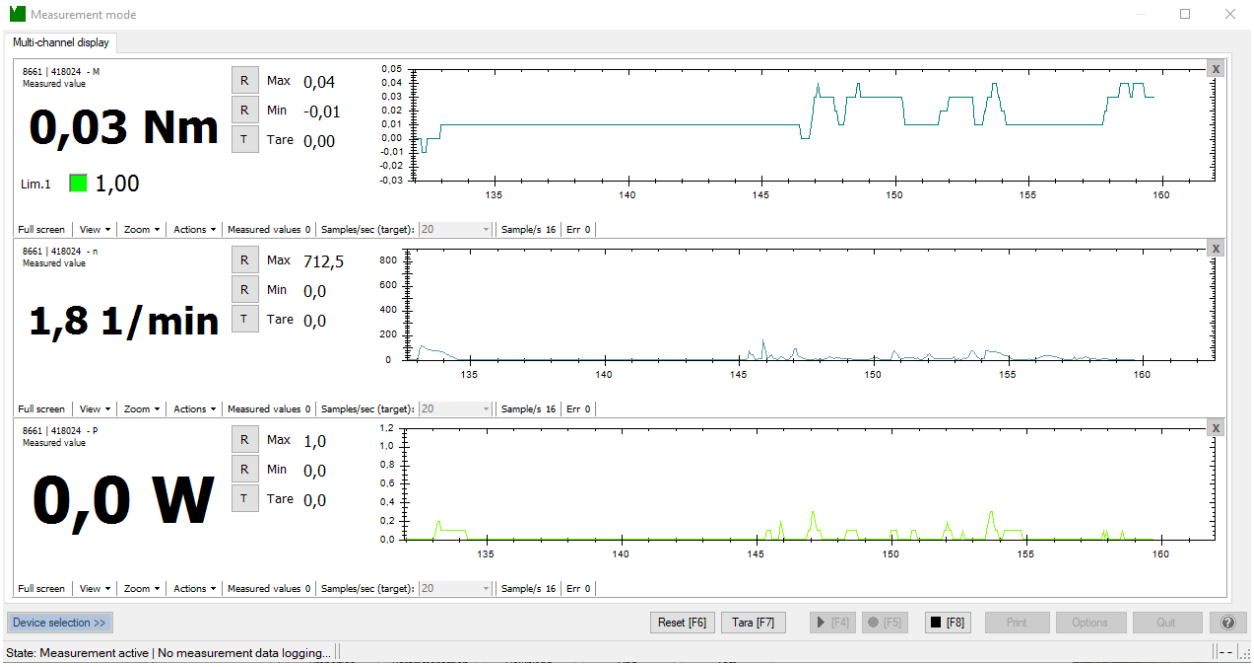
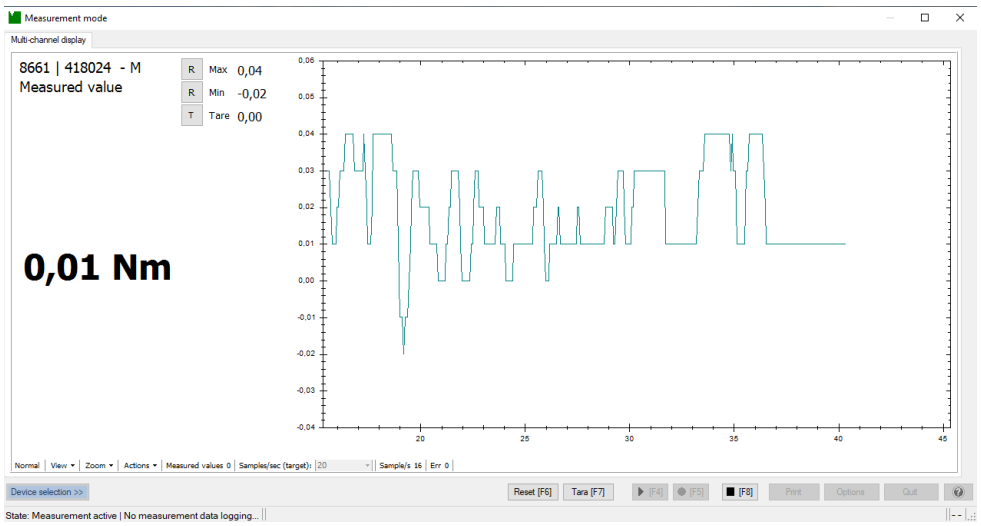


Figure 18: Display showing the measurement curves for torque, speed and mechanical power

In the Standard or Professional multi-channel software versions, you can switch between different views.

This is how it works

1. Click on “full screen” to get a larger view of the measurement curve. This enlarges the individual graph to full screen size during the measurement process.



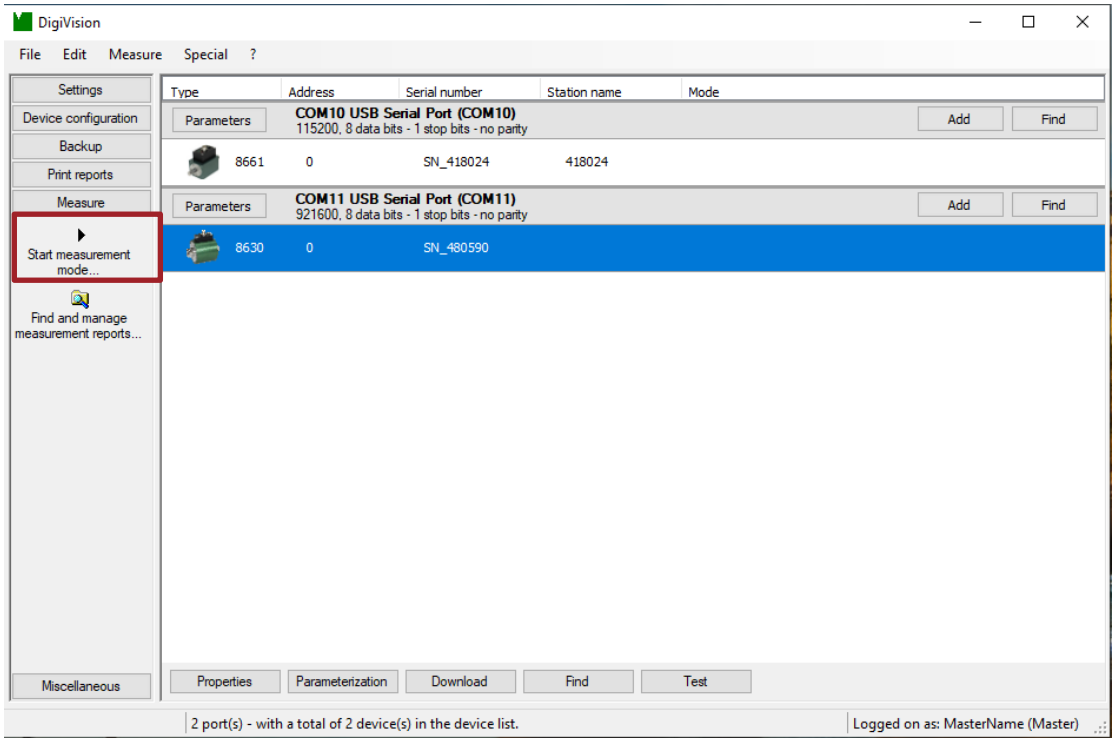
2. Click on “Normal” to revert to the standard view.

6.9 Start and stop measurement

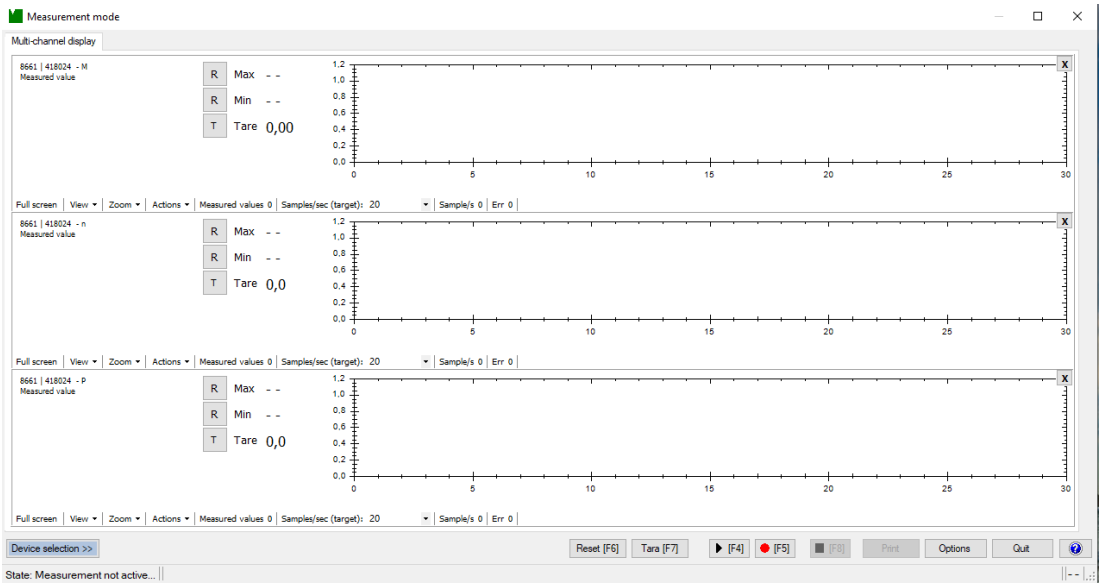
To start a measurement with DigiVision and a connected torque sensor, follow the steps below:

This is how it works

1. Select the torque sensor in the device list and click “Start measurement mode...” under “Measure” in the left-hand menu bar.



2. Click on “Start measurement” or press **[F4]** to start displaying the values, or **[F5]** for recording.



3. During the measurement process, the instantaneous measured value and minimum and maximum values are displayed and updated at the set measurement rate. Click on “R” or press **[F6]** to reset the maximum or minimum values, “T” or **[F7]** to tare the current value.

4. To stop measuring, click “Stop measurement” or press **[F8]**. Measurement can also be stopped using a trigger with a suitable stop condition. For more information on the trigger function, see section 6.6 Trigger on page 24.

6.10 Measurement reports

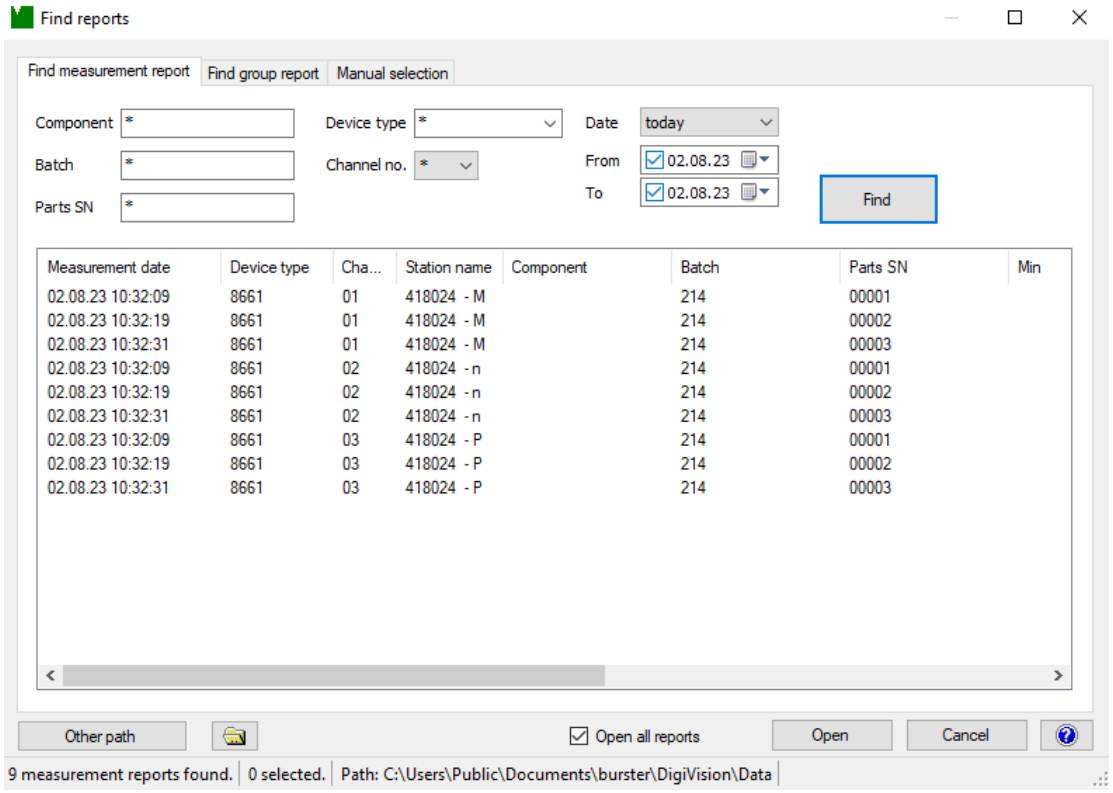
Note: If you wish to save the raw data for the measurement data reports, before starting measurement you must tick the “Save raw data measurement files” under “Preferences” > “Data storage”.

6.10.1 Measurement report finder

DigiVision has a convenient archiving feature for measurement reports. It lets you save all measurements that have been made, and then retrieve them again as required. You can use the “find reports” feature to perform the following actions for one or more reports: view, analyze, print, save as a PDF document or export to an Excel file.

This is how it works

1. To access the report search, click on “Measure” in the left-hand menu bar and then on “Find and manage measurement reports”.



2. Here you have a choice of two different report types: measurement report or group report.

   A measurement report displays each individual physical variable (M, α, n, P), which are presented as one measurement sequence.
   A group report is a report that contains all the measurement sequences. The individual measurement reports that were involved in the measurement are recorded here. This makes it easier to assign the measured variable.
   Select the report type you require.

3. Various filters such as device type, date and channel number can be used to reduce the number of measurement reports displayed for a clearer picture. Left-click on the measurement report you want to select. If you want to select more than one measurement report, hold down the **[CTRL]** key while selecting multiple reports.

4. Once you have selected the measurement reports, click “Open”.

6.10.2 Archive viewer

Once you have selected the measurement reports from the Find reports window, the Archive viewer opens. This gives you detailed information on your measurement. The Archive viewer is also the management center for viewing and editing measurement reports.

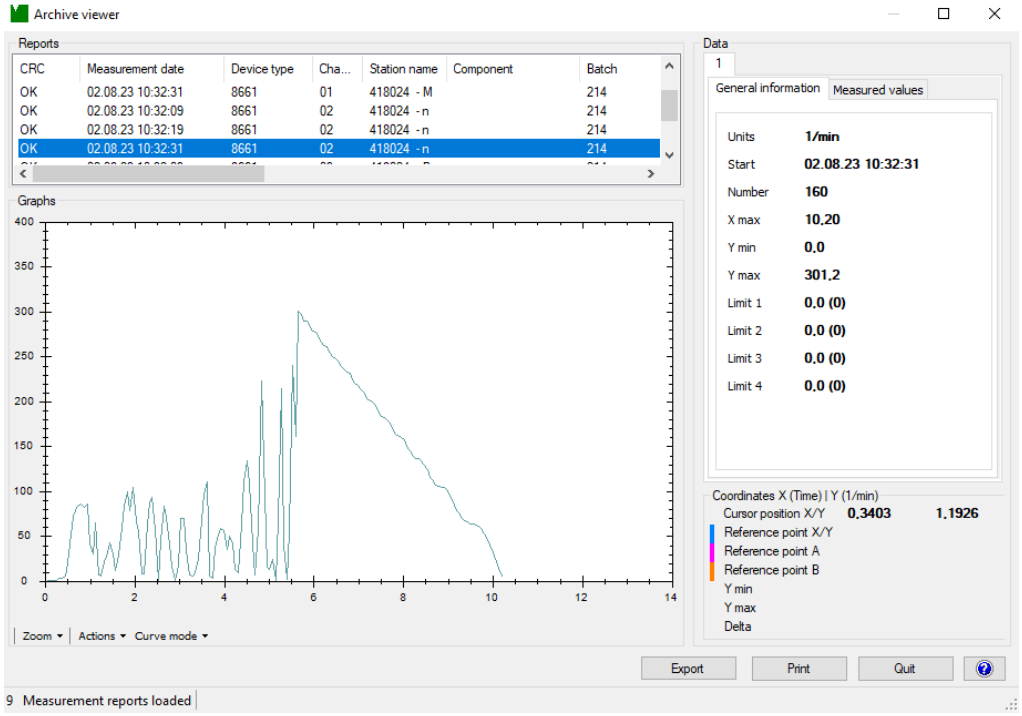


Figure 19: Archive viewer

This is how it works

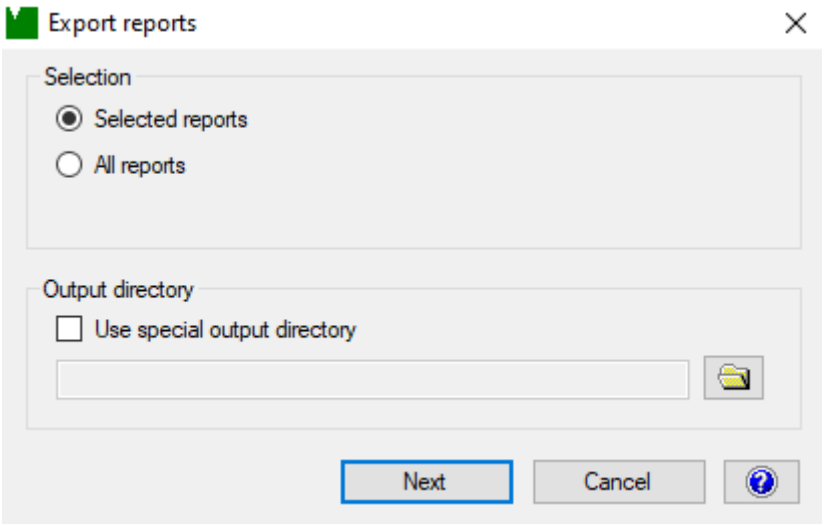
1. To view each measurement report separately, left-click on the desired measurement report.
2. To group together several measurement reports, i.e. to superimpose the measurement curves in one graph, press the **[CTRL]** key while left-clicking on the measurement reports you wish to display.

6.10.3 Export measurement reports to Excel

Note: To export the measurement reports in the Excel format you will need Microsoft Excel or an equivalent piece of software.

This is how it works

1. Once you have selected the measurement reports you click on “Export” to export an XLS file.
2. Specify whether you wish to export all the reports or just those you have selected.
3. Specify the path to the directory in which you wish to save the file. The default setting is to save the XLS files in the same directory as the measurement reports. You can also specify an alternative path here.

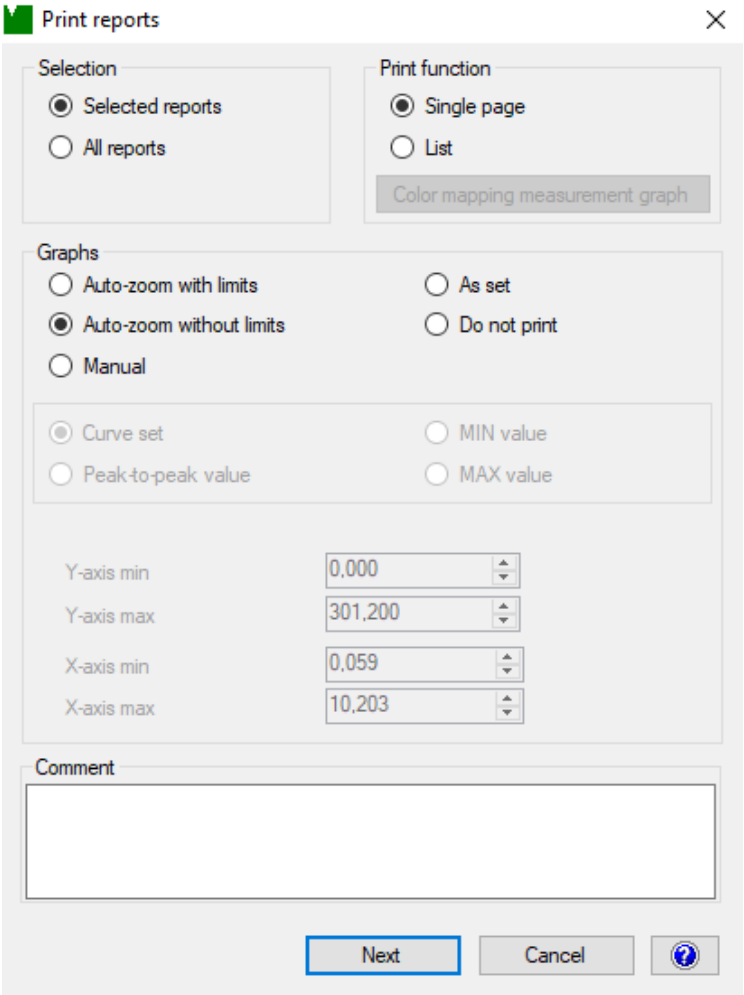


4. Click “Next”.
5. The data is converted and saved in the specified directory.

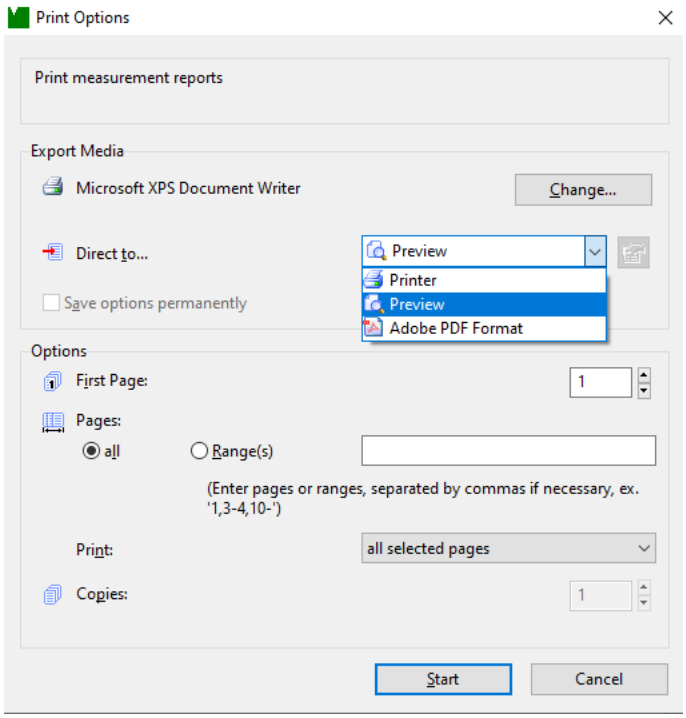
6.10.4 Print measurement reports

This is how it works

1. Once you have selected the measurement reports you click “Print”.



2. Select how you want the measurement reports to be printed.
3. Click “Next”. The Print Options window opens.



4. Now specify how you want the data to be output. You have the option to choose a printer, print preview or output as a PDF document.
5. Click on “Start”.
6. The data is output according to your settings.

7 Installing DigiVision

7.1 System requirements

Item	Manufacturer / description
Operating systems	Windows Server 2003, Windows XP, Windows 7, Windows 8, Windows 10
Processor	At least Pentium 1200 MHz, Pentium 2.0 GHz recommended
Graphics card	At least VGA 800 x 600; at least 256 colors
Memory	At least 2048 MB RAM
Hard disk	Approx. 500 MB free
Input devices	Microsoft-compatible mouse, standard keyboard
Font setting	Small fonts

7.2 Software installation

IMPORTANT: To install DigiVision, the user needs to be logged in as an administrator.

This is how it works

1. Download the latest version of DigiVision from our website and unzip the package.
2. Run Setup.exe and follow the instructions of the installation routine.

7.3 Driver installation

If DigiVision has been installed, it is not necessary to install the drivers separately. If you want to install just the drivers, e.g. if LabView is used, please install the burster Instrument drivers. The driver package can be found in the download area on our website.

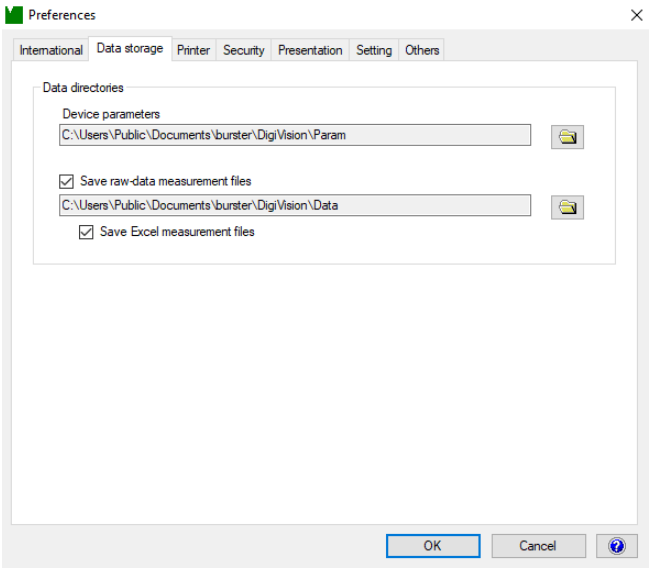
IMPORTANT: To install the driver, the user needs to be logged on as an administrator.

7.4 Data storage

In order to be able to store the raw data from measurements carried out, you simply need to enable the option “Save raw-data measurement files” once before starting the measurement.

This is how it works

1. In the DigiVision device list, click on “Edit” > “Preferences“ > “Data storage”.
2. Tick the checkbox for “Save raw-data measurement files” and click “OK”.


Preferences
International
Data storage
Printer
Security
Presentation
Setting
Others
Data directories
Device parameters
C:\Users\Public\Documents\burster\DigiVision\Param
Save raw-data measurement files
C:\Users\Public\Documents\burster\DigiVision\Data
Save Excel measurement files
OK
Cancel

8 Software version and licensing

8.1 DigiVision Light

The USB torque sensor is supplied with the free DigiVision Light configuration and analysis software. This version provides the following functions:

- Measurement function for one sensor
- Maximum sampling rate of 200 measured values per second
- Display of angle or speed (for relevant sensor model)
- Calculation of mechanical power (only with the angle or speed measurement option)

8.2 86xx-P100, Standard version

An upgrade from the DigiVision Light version to the Standard version (86xx-P100) can be purchased as an option (license key). In comparison to the Light version, the Standard version includes the following extra functions:

- 16-channel measurement for up to 16 sensors in parallel
- Maximum sample rate of the sensor possible

In the multichannel versions, you can switch between different views (for further details see section 6.8 Display on page 26).

This is how it works

1. Click on “full screen” to get a larger view of the measurement curve. This enlarges the individual graph to full screen size during the measurement process.
2. Click on “Normal” to revert to the standard view (see section 6.8 Display on page 26 for details).

8.3 86xx-P200, Professional version

The DigiVision Professional version (86xx-P200) is available as an upgrade for DigiVision Light or Standard. In comparison with the Standard version, the Professional version includes the following extra functions:

- Additional user-configurable mathematical channels.
- 32-channel measurement for up to 32 sensors in parallel

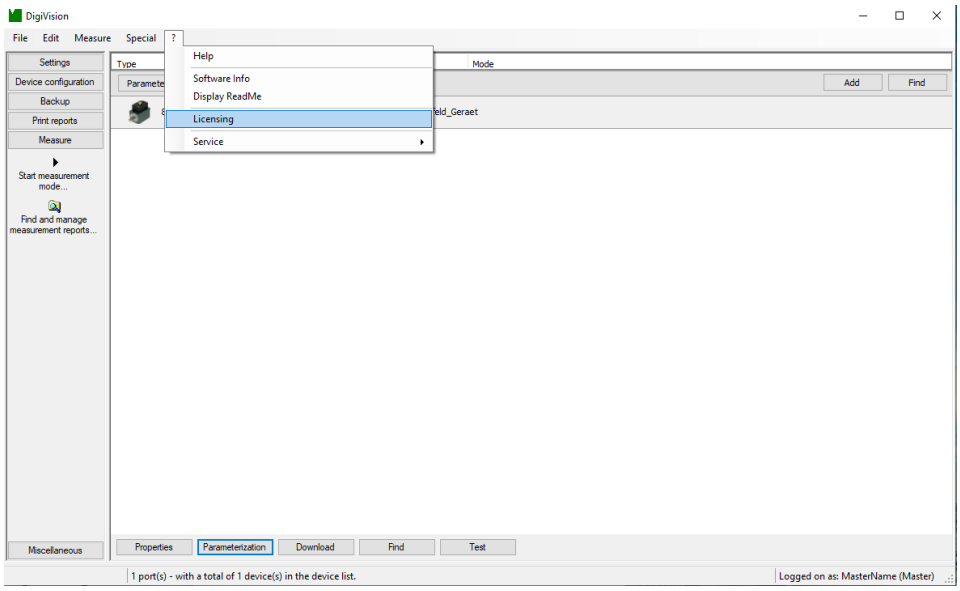
See below for an example of how to configure an additional mathematical channel. Simple calculations such as calculating the efficiency or difference speeds and also complex mathematical operations can be performed.

8.4 Licensing

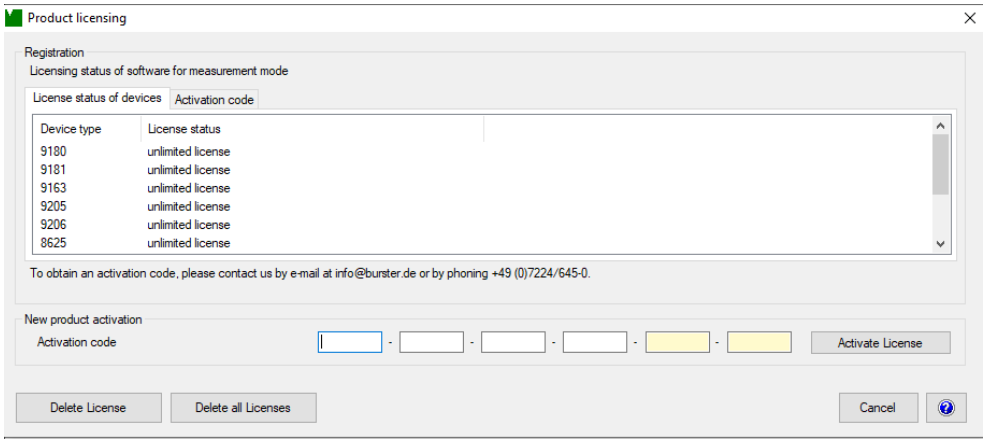
To activate the DigiVision Standard or Professional version, follow these steps:

This is how it works

1. In the top menu bar, click Help > Licensing.



2. Enter your license key. The license key could look like this: 12345-12345-12345-12345. Make sure that you enter the license key exactly as it appears in your license documents.

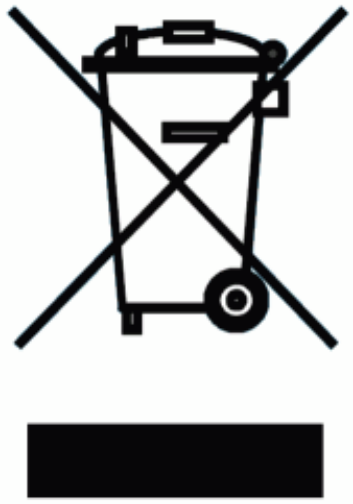


3. Click “Activate License”. When the correct license key is entered, the corresponding device type is activated. If the license key is invalid, the licensing process is terminated.

8.5 Uninstall

Follow these steps to uninstall the software: Go Start > Settings > Control Panel, open the Programs group and select the “DigiVision” entry in the installation list. You can then uninstall the application by selecting “Add/Remove” and “Remove program” in the installation routine.

9 Disposal



Battery disposal

In Germany, the end user is legally obliged to return all used batteries, and it is illegal to dispose of batteries in the household waste. This law may also affect you as purchaser of the instrument described here. Please dispose of your used batteries properly and in accordance with national statutory regulations. Either take them to the relevant collection point in your organization or to the collection points provided by your local authority, our company or any battery retail outlet.

Instrument disposal

If your instrument is no longer usable, please comply with your legal obligations by disposing of the instrument described here in accordance with statutory regulations. You will then be helping to protect the environment!