

USER MANUAL EvaluationTools

STIM210 Evaluation Kit - USB

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## EvaluationTools

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#### 1 EVK features

- USB connectivity to PCs/ laptops
- Up to 2000Hz sampling rate supported
- Temperature measurements supported
- Service mode access
  - Full gyro module information
  - Full gyro module configuration capability
  - Detailed gyro module diagnostics
  - Help section
- Measure panel
  - o Data presentations and save data to file capability
  - Custom scale and zoom functions
  - CRC check
- Logging panel
  - Support for any measurement duration, only limited by hard drive, available memory and processor capacity of PC
  - Various stop criteria for measurements available ('Manually', 'No. of samples' or 'Time elapsed')
- Measurements of up to 4 gyro modules simultaneously supported (requires additional cables depending on the type of evaluation kit)

#### 1.1 General description

The evaluation kit provides measurement and configuration access to STIM210 gyro. Configuration, graphical result presentation and saving data to file functions are supported. The single voltage supply required for the gyro module operation is provided from an USB port.

| Feature                                    | Available             |
|--|-----------------------|
| Portability across PC's                    | No                    |
| Hardware installation required?            | Yes                   |
| Gyro output available?                     | Yes                   |
| Temperature data available?                | Yes                   |
| TOV, PPS, CRS, External trigger available? | Yes (break-out cable) |
| Transmission rate supported                | Up to 5.34Mbit/s      |

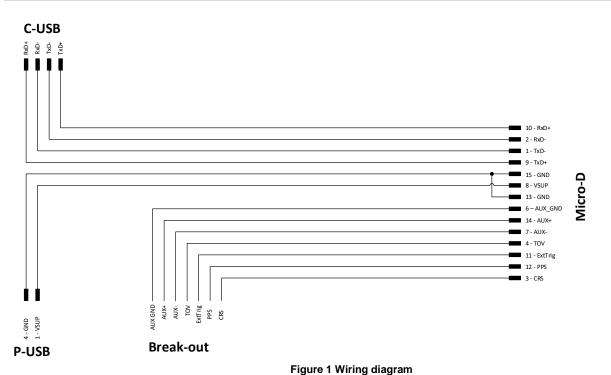
Table 1: Features of PCI/PCIe kit





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#### 1.2 Configurable and readable parameters

Configurable parameters in Service Mode:

- Output format (angular rate, increment angle etc.)
- Datagram format
- Sampling rate
- Bandwidth / Low pass filter frequency
- RS-422 transmission bit rate
- Number of stop bits in datagram
- Parity
- Line/ Datagram termination

Readable parameters:

- Part number
- Serial number
- Firmware revision
- Hardware revision
- Gyro module diagnostics

Detailed diagnostic information including RAM and flash checks, stack handling checks, status of internal voltage supply references, and various parameter reports for each measurement axis is available in SERVICE mode.

**Note**: Time of Validity (TOV) and external trigger functionalities of STIM210 are not supported by the EVK PC-software.

#### 2 Kit contents

- USB to RS422 interface cable with USB power supply connector
- Memory stick with
  - PC software
  - o FTDI CDM20824 serial driver for Windows
  - User manual for evaluation kit
- Tool for fixing connector of communication and power cable to the gyro module



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• Hard copy of User manual

Note that the evaluation kit does not include a STIM210 gyro module. This must be ordered separately.

#### 3 System requirements

- Windows XP SP2 (or later), Windows Vista, Windows 7 (32/ 64bit), Windows 10 (32/ 64bit)
- 2 free USB ports
- Quad core processor recommended (when simultaneously logging data from two gyro modules)



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#### 4 Getting started

Preparing your system involves the following steps:

| FTDI Serial Driver installation |  |  |
|---------------------------------|--|--|
|                                 |  |  |
| Serial Driver verification      |  |  |
|                                 |  |  |
| EVK PC Software installation    |  |  |

#### 4.1 USB kit Installation of FTDI serial driver

To install the drivers for the FTDI serial driver under Windows, follow the instructions below:

- Connect the USB-RS422 plug to a spare USB port on your PC.
- If there is an available Internet connection, some Windows versions will silently connect to the Windows Update website and install a suitable driver
- In the event that no automatic installation takes place, please refer to the set-up guide from FTDI: <u>http://www.ftdichip.com/Support/Documents/InstallGuides.htm</u>



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#### 4.2 Verification and configuration of serial driver

Launch Device Manager. See Control Panel -> Hardware and Sound -> Devices and Printers.

Verify that the driver installation has completed successfully:

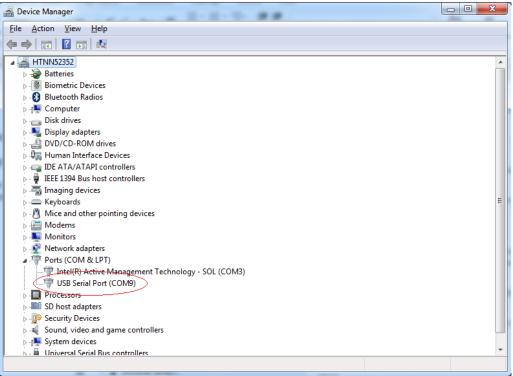


Figure 1: COM port assignments for USB cable in Windows 7.

Make a note of the assigned COM port value(s) information. This will be needed later for connecting to the STIM210 from the PC software.

USB Serial Port (COM9) Properties

Right-click "USB Serial Port (COM<n>)" and select "Properties"

Select "Advanced" from the "Port Setting" tab.



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| Advanced Settings for COM9   | <u>ନ୍</u>                                     |
|--|---|
| COM Port Number: COM9  | • ОК  |
| USB Transfer Sizes<br>Select lower settings to correct performance problems at low | Cancel Defaults                               |
| Select higher settings for faster performance.                                     |   |
| Receive (Bytes):   |   |
| Transmit (Bytes):  |   |
| BM Options   | Miscellaneous Options                         |
| Select lower settings to correct response problems.                                | Serial Enumerator                             |
|  | Serial Printer                                |
| Latency Timer (msec):  | Cancel If Power Off Event On Surprise Removal |
| Timeouts   | Event On Surprise Removal                     |
| Timeouts   | Disable Modem Ctrl At Startup                 |
| Minimum Read Timeout (msec):   | Enable Selective Suspend                      |
| Minimum Write Timeout (msec):  | Selective Suspend Idle Timeout (secs): 5      |
|  |   |

Set the "Receive (Bytes)" and Transmit (Bytes) settings to 256. Press OK twice.

The computer may have to be restarted for the changes to take effect.



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#### 4.3 Installation of PC software

Install the PC software by running "setup.exe" found on the included memory-stick. Follow the on-screen instructions to complete the installation. The PC software also can be downloaded from the <u>Sensonor support site</u>. Check this site regularly for updates.

#### 5 Connecting the STIM to your PC

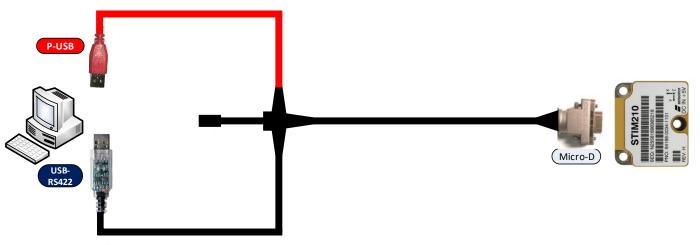


Figure 2 Connecting the STIM210 to the computer

#### 6 Using PC software

1. Navigate to the 'Sensonor evaluation tools' folder from Windows start menu. Click on the shortcut named "STIM210 EVK" to start the PC software. For full functionality, the computer user should have Local Administrator rights.

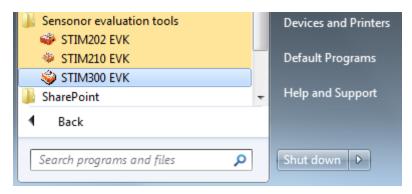


Figure 3: Starting PC software from Windows start menu

 A pop-up box appears, asking for a parameter (.INI) file. Select the INI-file (available in the installation folder by default) and press "Load"



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| Main panel <u>File</u> <u>H</u> elp |                       |                                       |                                   |                     |         | - 0 X    |
|-------------------------------------|-----------------------|---------------------------------------|-----------------------------------|---------------------|---------|----------|
| Loadingplease wait                  |                       |                                       |                                   | S                   | TIM 210 | sensonor |
|                                     | 🌞 Select parame       | ter-file                              |                                   | ×                   |         |          |
|                                     | Directory<br>History: | Sensonor evaluation tools\STIM210 EVK |                                   | •                   |         |          |
|                                     | Look in:              |                                       |                                   |                     |         |          |
|                                     | Quick access          | Name STIM210_EvalKit.INI              | Date modified<br>16.10.2019 12:30 | Type<br>Configura   |         |          |
|                                     | Desktop               |                                       |                                   |                     |         |          |
|                                     |                       | < File name: Files of type: ('.INI)   | •                                 | ><br>Load<br>Cancel |         |          |
|                                     |                       |                                       |                                   |                     |         |          |
| ParaFile                            |                       |                                       |                                   |                     |         |          |

Figure 4: INI-file selection

3. A pop-up box for software registration appears. Fill in the open fields and press "Submit". The default email client opens. Press "Send" in order to complete this step (user information is sent to Sensonor for support issues). This step will only have to be completed once.

| STIM210 EVK PC Software V8.0<br><u>File</u> <u>H</u> elp |  |                        | – 🗆 X    |
|--|--|------------------------|----------|
| Nomal mode Service mode Measure I                        | ogging Parameters  | STIM 210               | sensonor |
|  | titate power on<br>squence<br>On<br>Off<br>Reset<br>device<br>Request<br>config DG<br>Request<br>identity DG<br>Request<br>serial # DG | Request<br>ext, sts DG |          |
| from HW  | Registration   |                        |          |
|  | Welcome to STIM210 Evaluation Kit  |                        |          |
|  | Please spend a short time to register this installation  |                        |          |
|  | Organization   |                        |          |
|  | Department   |                        |          |
|  | Name   |                        |          |
|  | E-mail   |                        |          |
|  | Submit   |                        |          |
|  |  |                        |          |
|  |  |                        |          |
| ParaFile   | Idle in demo mode  |                        |          |

Figure 5: Welcome message and software registration



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#### 4. The Normal mode panel is shown

| STIM210 EVK PC Software V8.0<br><u>File</u> <u>H</u> elp |  |                       | - 🗆 X    |
|--|--|-----------------------|----------|
| Normal mode Service mode Measure Logging Param           | eters                                      | STIM 210              | sensonor |
| Connect<br>to HW<br>Disconnect<br>from HW<br>Device      | Reset     Request     Request       device | Request<br>ext.sts DG | 4        |
| ParaFile   | Idle in demo mode                          |                       |          |

Figure 6: Normal mode panel after selecting INI-file

5. Verify the correct COM port settings in the Parameters view. If needed port # setting needs to be changed, do this by double clicking on the value and enter correct value. The default password to edit is 'stim'.

| Normal mode Service mode Measure Logging Parameters |                     | STIM 210 STIM 210 |
|---|---------------------|-------------------|
| ===== General parameters =====                      |                     |                   |
| Password  | : ****              | OK                |
| Folder for result-file storage                      | : C:\userdata\test\ |                   |
| What priority will this program run with?           | : Above normal      |                   |
| What format to use for resultfiles?                 | : ASCII text        |                   |
| Name of file with language definitions              | :                   | Edit              |
| ===== Device communication =====                    |                     | Lan               |
| IMPORTANT MESSAGE: Always verify hardware           |                     |                   |
| connections and COM port settings before            |                     |                   |
| trying to connect to the device                     |                     |                   |
| RS422 port # to device 1                            | : 4                 |                   |
| RS422 port # to device 2                            | : 3                 |                   |
| RS422 port # to device 3                            | : 0                 |                   |
| RS422 port # to device 4                            | : 0                 |                   |
| RS422 Bitrate [bits/s]                              | : 921600            |                   |
| RS422 Stopbit                                       | : 1                 |                   |
| RS422 parity  | : None              |                   |
| ===== External hardware =====                       |                     |                   |
| The GPIB-card # to use                              | : 0                 |                   |
| Type of power-supply used                           | : None              |                   |
| Interface that the power is connected with          | : None              |                   |
| Port or address to power                            | : 0                 |                   |
| Voltage on output of power [V]                      | : 5.1               |                   |
| Current limit on output of power [A]                | : 1.0               |                   |
|   |                     |                   |
|   |                     |                   |
|   |                     |                   |
|   |                     |                   |
|   |                     |                   |
|   |                     |                   |
|   |                     |                   |
|   |                     |                   |
|   |                     |                   |
|   |                     |                   |
|   |                     | <u>*</u>          |

Figure 7: Edit the INI-file in order to verify correct COM port settings



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6. Go back to Normal mode panel. Connect to and open COM port by pressing the 'Connect to HW' button. A green LED light indicates that the COM port is active

| STIM210 EVK PC Software V7.0<br>Eile Help  |  |                        | - 🗆 X    |
|--|--|------------------------|----------|
| Nomal mode Service mode Measure Logging Param  | neters   | STIM 210               | sensonor |
| Corrrect<br>In HW<br>Device<br>Trom HW<br>Data arriving from device 1<br>Serial no. device 1 | Beauest config DG       Beauest dentity DG       Beauest dentity DG         Response       Second and a | Request<br>red. sta DG |          |
| c:\Sensonor evaluation tools\STIM210 EVK\STIM210   | EvalKit.INI HW connected OK  |                        |          |

Figure 8: Normal mode panel after first hardware connection

7. Switch the 'Initiate power-on sequence' control switch position to 'On' position. Do not insert the power supply cable at this point. The pop-up message asking for confirmation of bitrate appears. Press OK.

| STIM210 EVK PC Software V8.0   |   | - D X          |
|--|---|----------------|
| <u>Eile</u> <u>H</u> elp   |   |                |
| Normal mode Service mode Measure Logging Paran   | stri  | M 210 sensonor |
| Initiate poweron<br>sequence<br>Initiate poweron<br>sequence<br>Initiate poweron<br>sequence<br>Initiate poweron<br>sequence<br>Initiate poweron<br>sequence<br>Initiate poweron<br>Initiate pow | Heset     Request     Request     Request       device     Bend # DG     Bend # DG         Response         Current bitrate is set to 460800 b/s, continue?         OK     Cancel | ruest<br>ds DG |
| ParaFile   | HW connected OK   |                |

Figure 9: Confirm bitrate



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8. A pop-up message telling "Connect power cable to voltage supply and then press OK to continue" appears. First insert the red USB connector into a free USB port of the PC/ laptop and then confirm the supply voltage is applied by pressing 'OK'

| STIM210 EVK PC Software V8.0<br><u>File</u> <u>H</u> elp |  | - 🗆 🗙                 |
|--|--|-----------------------|
|  | ameters  | TIM 210 sensonor      |
| Corrrect<br>to HW  | Reset Request Request Request  | Request<br>ext.sts DG |
|  | MESSAGE #12 X<br>Connect power cable to voltage supply and then press OK to continue |                       |
| ParaFile   | HW connected OK  |                       |

Figure 10: Confirm power supply is switched on

9. A green LED (Data arriving from device n) indicates that data is received from the gyro module(s). Verify the communication to module by clicking on the 'Request serial# DG' button. An example of such a result is shown in Figure 11. The system is now ready for use

| STIM210 EVK PC Software V8.0<br>File Help   |   | - 🗆 X                |
|---|---|----------------------|
| Normal mode Service mode Measure Logging Param  | sters STIM 2  | 210 <i>s</i> ensonor |
| Connect       Image: Connect Sequence         Disconnect       Device         Image: Connect Sequence       Image: Connect Sequence         Data arriving from device 1       Image: Connect Sequence         Serial no. device 1       Image: Connect Sequence | Reset<br>device     Request<br>config DG     Request<br>identity DG     Request<br>end # DG     Bequest<br>exit as DG       Response       Serial number     = N25581411564141       CRC     = 57 - 57 OK |                      |
| ParaFile  | HW connected OK   |                      |



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Figure 11: Result of sending 'Request serial# DG' to the STIM210



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### 7 Introduction to PC software

#### 7.1 Panels overview

In addition to the panel already shown (Normal mode and Parameters panel), other panels are also available:

#### 7.1.1 Service mode panel

| STIM210 EVK PC Software V8.0<br><u>File</u> <u>H</u> elp |   | - 🗆 X             |
|--|---|-------------------|
| Normal mode Service mode Measure Logging Parame          | sters   | STIM 210 sensonor |
| Available commands                                       | Send<br>command       Active device 1         Complete command         Complete command         Command response         SERIAL NUMBER = N25581411564141         PRODUCT = STIM210         PART NUMBER = 00000-0000-0000 REV -<br>HW CONFIG = SWD11860 REV 9         OUTPUT UNIT = ['s] - ANGULAR RATE         SAMPLE RATE [samples/s] = 125         GYRO CONFIG = XYZ         GYRO CONFIG = XYZ         GYRO RANGE:         X-AXIS: ± 400's         Z-AXIS: ± 400's         Z-AXIS: ± 400's         Z-AXIS: ± 400's         LP FILTER -3dB FREQUENCY, X-AXIS [Hz] = 262         LP FILTER -3dB FREQUENCY, Z-AXIS [Hz] = 262         DATAGRAM FORMAT = RATE AND TEMPERATURE         BIT-RATE [bps] = 460800         DATA LENGTH = 8         STOP-BITS = 1         PARITY = NONE         LINE TERMINATION = ON | Ease<br>Save      |
| c:\Sensonor evaluation tools\STIM210 EVK\STIM210_1       | EvalKit.INI SERVICE MODE  |                   |

Figure 12: Service mode panel



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#### 7.1.2 Measure panel

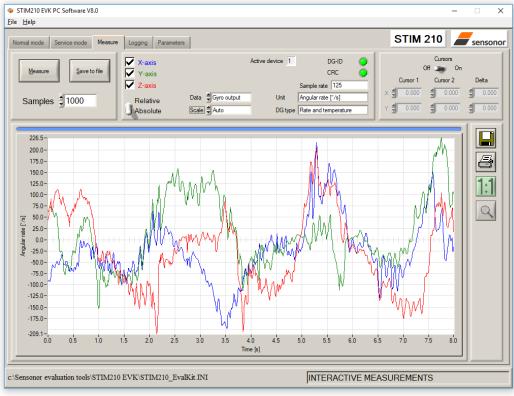


Figure 13: Measure panel

### 7.1.3 Logging panel

| STIM210 EVK PC Sof        | ftware V8.0   |                              |             |                |          | >       |
|---------------------------|---|------------------------------|-------------|----------------|----------|---------|
| <u>F</u> ile <u>H</u> elp |   |                              |             |                |          | _       |
| Normal mode Service       | e mode Measure Logging  | Parameters                   |             |                | STIM 210 | sensono |
| <u>Start</u>              | Stop criteria<br>Manually-<br>No of samples-<br>Time elapsed- | Samples 🗯 100<br>Average 👙 1 | Time elapse | d 00:00:00     |          |         |
|                           |   | Devices to be me             | asured      |                |          |         |
|                           | Serial no.  | Samples acquired             | CRC errors  | Resynch's      |          |         |
| 1 🔽                       | N25581411564141   | 100                          | 0           | 0              |          |         |
| 2 🗖                       |   | 0                            | 0           | 0              |          |         |
| 3 🗖                       |   | 0                            | 0           | 0              |          |         |
| 4 🕅                       |   | 0                            | 0           | 0              |          |         |
|                           |   |                              |             |                |          |         |
|                           |   |                              |             |                |          |         |
|                           |   |                              |             |                |          |         |
|                           |   |                              |             |                |          |         |
|                           |   |                              |             |                |          |         |
|                           |   |                              |             |                |          |         |
| c:\Sensonor evaluatio     | m tools/STIM210 EVK/STIM                                      | 210_EvalKit.INI              | LO          | GGING COMPLETE | Đ        |         |

Figure 14: Logging panel (for saving data to file)



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## 7.2 Main panel menu

| Table 2: The options available from the main panel menu. |   |  |  |  |
|--|---|--|--|--|
| Menu   | Description   |  |  |  |
| 'File' $\rightarrow$ 'New parameter file'                | Creates a new INI-file with default settings. Note that the new INI-file must be edited to match the hardware and gyro module configuration settings. |  |  |  |
| 'File' $\rightarrow$ 'Open parameter file'               | For loading an existing INI-file  |  |  |  |
| 'File' $\rightarrow$ 'Save parameter file as'            | To save current parameter settings with a new file name   |  |  |  |
| 'File' → 'Print parameters'                              | For printing the current 'Parameters' content on the default printer  |  |  |  |
| 'File' → 'Edit parameters'                               | Edit the 'Parameters' content   |  |  |  |
| 'File' $\rightarrow$ 'Exit'                              | Exit program  |  |  |  |
| 'Help' $\rightarrow$ 'Check for updates'                 | Opens the Sensonor support site in a web browser. New and updated Drivers, PC software and user manuals can be downloaded                             |  |  |  |
| 'Help' → 'About'   | Information about the program (Program name, publisher and software revision number)  |  |  |  |

| <u>H</u> elp         |
|----------------------|
| ew parameter file    |
| oen parameter file   |
| ve parameter file as |
| int parameters       |
| lit parameters       |
| it                   |
|                      |

## Help

Check for updates

About

Figure 16: Help menu



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#### 7.3 Normal mode panel descriptions

Table 3: Normal mode panel descriptions.

| Panel unit                        | Functionality and description  |
|-----------------------------------|--|
| Connect to HW                     | Connects to interface hardware. Opens COM port according to settings specified in active parameter file  |
| LED                               | Indicator for hardware connection. A GREEN light indicates the COM port is<br>opened   |
| Disconnect from HW                | Disconnects from interface hardware. Closes the COM port   |
| Initiate power-on sequence switch | Toggles supply voltage if configured with an external power supply. Controls certain functions of the PC software  |
| Device box                        | Device number (and corresponding COM port) according to active parameter file.<br>Selects which gyro module is activated for datagram requests in Normal mode,<br>Service mode operations and measurements in Measure panel. Does not apply for<br>Logging panel |
| Reset device button               | Resets the gyro module. Sends reset command ('R')  |
| Request config DG button          | Sends command ('C') to receive configuration datagram  |
| Request identity DG button        | Sends command ('N') to receive part number datagram  |
| Request serial# DG button         | Sends command ('I') to receive serial number datagram  |
| Request Ext status button         | Sends command ('E') to receive extended error information datagram   |
| Response window                   | Displays response to special datagram requests ('C', 'N' and 'I' datagrams)  |

#### 7.4 Service mode panel descriptions

Service mode is used for gyro module configuration.

Service mode is entered by clicking on the Service mode tab next to the Normal mode tab after the gyro module has been powered up. Service mode usage, functionalities and descriptions are listed in Table 4. Exit from Service mode to Normal mode by selecting one of the other panel tabs (Normal, Logging, Service or Parameter panel tab).

Note: Changes made for the gyro module in Service mode are only stored permanently in flash memory when the save command ('s') subsequently is sent to the gyro module.

#### Table 4: Service mode panel descriptions.

| Panel unit                | Functionality and description  |  |  |
|---------------------------|--|--|--|
| Available commands window | Shows a list of available commands. See product datasheet for details  |  |  |
| Complete command window   | Contains the complete command to be sent. The command is auto-completed by<br>the software during usage of the listings in the Available commands window. Left<br>click inside the Complete command window brings up a list of previously sent<br>commands. Right click enables manual command entry |  |  |
| Send command button       | Sends command to the gyro module   |  |  |
| Active device indicator   | Indicates active gyro module. Corresponding COM port is specified in the active<br>parameter file  |  |  |
| Command response window   | Shows the responses to commands from the gyro module. See product datasheet for details  |  |  |
| Erase button              | Clears the content of the command response window  |  |  |
| Save button               | Saves the content of the command response window to a text file with a date and time tag   |  |  |

#### 7.5 Measure panel descriptions

#### Table 5: Measure panel descriptions.

| Panel unit Functionality and description |   |
|--|---|
| Measure button                           | Starts a measurement series                               |
| Samples box                              | Defines the number of samples to be collected (max 50 MS) |



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| Save to file button           | Saves data from a completed measurement series to a result file. The file path                 |
|-------------------------------|--|
|                               | defined in the active parameter file is proposed   |
| X-, Y- and Z-axis check boxes | Selects which axis data to present in the graph area (up to 3 axes can be plotted              |
|                               | simultaneously)  |
| Relative and absolute toggle  | When set to 'Absolute', all results are plotted as received. When set to 'Relative'            |
| switch                        | the curves are translated so that the first measurement is shown in the plot as zero.          |
| Active device indicator       | Indicates active gyro module. Corresponding COM port is specified in the active parameter file |
| CRC and DG-ID LEDS            | Status on all CRC checks and DG-IDs. GREEN = OK, RED = FAIL                                    |
| Data box                      | Selects which datagram content to be shown. Several options are available,                     |
|                               | depending on the active datagram type. Left click inside box to display available              |
|                               | selections. The plot updates immediately if a measurement series has been done.                |
| Scale box                     | Enables user to change Y-axis scaling (Full range, User defined, or Auto). Left click          |
|                               | inside box to display available selections   |
| Sample rate box               | Displays the sample rate used in measurement   |
| Unit box                      | Displays the output unit for all measurements (Angular Rate, Incremental Angle,                |
|                               | etc.)  |
| DG type box                   | Displays the type of datagram received   |
| Save to disk icon             | Saves the plot to a .JPG file  |
| Print icon                    | Prints a picture of the plot to the default printer  |
| 1:1 icon                      | Resets zoom level to 1:1 (if ZOOM is active. See below)  |
| Zoom icon                     | Enables a custom zoom of the presented results in the strip chart (graph area)                 |
|                               | according to placement of the cursors  |
| Cursors (On/Off) switch       | Enables usage of cursors (default is Off)  |
| Cursor 1                      | Shows the location of cursor no 1  |
| Cursor 2                      | Shows the location of cursor no 2  |
| Delta                         | Shows the delta between the two cursor locations (X and Y values)                              |
| Progress bar                  | A blue continuous line above plot area shows the measurement series progress                   |
| Lower bar on panel            | Shows the INI-file in use and the active mode (INTERACTIVE MEASUREMENTS)                       |
|                               |  |

#### Saved data:

An example of a result file is shown in Figure 17, for a standard datagram measurement series of gyro module # 1. A description of each of the columns of the data log file is found in the table that follows.

| 20111220_181756  | 1.txt - Notepad   | in the second second  |  |  |   |   |  | x |
|--|---|---|--|--|---|---|--|---|
| <u>F</u> ile <u>E</u> dit F <u>o</u> rmat  | <u>V</u> iew <u>H</u> elp   |   |  |  |   |   |  |   |
| Time[s] x[*/s]<br>0.027696<br>0.028191<br>0.029190<br>0.029190<br>0.030191<br>0.030191<br>0.031195<br>0.031695<br>0.032691<br>0.032691<br>0.033191<br>0.033693 | Y[*/5] Z[*/5]<br>-0.085083<br>-0.107117<br>-0.095825<br>-0.103699<br>-0.186279<br>-0.323853<br>-0.377380<br>-0.327942<br>-0.309814<br>-0.302856<br>-0.286865<br>-0.286865<br>-0.263794<br>-0.188232 | STS         RXCRC           0.063416         0.117615           0.117615         0.188782           0.194275         0.168823           0.132996         0.026855           -0.071472         -0.059631           0.042847         0.124573           0.096802         0.053101 | CalCCRC DG_ID<br>-0.179016<br>-0.142639<br>-0.105164<br>-0.051208<br>-0.007507<br>-0.028870<br>-0.028870<br>-0.123718<br>-0.120972<br>-0.166870<br>-0.206482<br>-0.179993<br>-0.155334 | 128<br>128<br>128<br>128<br>128<br>128<br>128<br>128<br>128<br>128 | 70<br>202<br>44<br>205<br>30<br>200<br>50<br>140<br>223<br>220<br>78<br>53<br>249 | 70<br>202<br>44<br>205<br>30<br>200<br>50<br>140<br>223<br>220<br>78<br>53<br>249 | 144<br>144<br>144<br>144<br>144<br>144<br>144<br>144<br>144<br>144 |   |

Figure 17: Result file exampleNY FIGUR

#### Table 6: Result file example. (Standard datagram content written to file).

| DG-      | Col. # | Heading    | Comments  |
|----------|--------|------------|---|
| type     |        |            |   |
|          | 1      | Timolol    | Time in seconds (derived from sample rate). First |
|          |        | Time[s]    | sample is always zero.                            |
| p        | 2      | GYRO_X     | Gyro signal X-axis                                |
| dai      | 3      | GYRO_Y     | Gyro signal Y-axis                                |
| Standard | 4      | GYRO_Z     | Gyro signal Z-axis                                |
| S.       | 5      | GYRO_STS   | Status-byte for gyro                              |
|          | 6      | GYRO_TMP_X | Temperature, X-axis gyro                          |
|          | 7      | GYRO_TMP_Y | Temperature, Y-axis gyro                          |



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| 8  | GYRO_TMP_Z   | Temperature, Z-axis gyro                          |
|----|--------------|---|
| 9  | GYRO_TMP_STS | Gyro temperature status                           |
| 10 | Counter      | Sample counter. See product datasheet for details |
| 11 | Latency      | Sample latency. See product datasheet for details |
| 12 | RxCRC        | Received CRC                                      |
| 13 | CalCRC       | Calculated CRC                                    |
| 14 | DG_ID        | Datagram identifier                               |

#### 7.6 Logging panel

#### Table 7: Logging panel descriptions.

| Panel unit          | Functionality and description  |
|---------------------|--|
| Start button        | Starts data logging  |
| Stop button         | Stops data logging   |
| Stop criteria slide | User can select between "Manually", "No of samples" and "Time            |
|                     | elapsed" for stopping a measurement series                               |
| Samples box         | Used for defining number of samples when logging a finite number of      |
|                     | samples  |
| Average box         | Used for specifying how many samples should be averaged before           |
|                     | saving the averaged value to file. If values is '1' no averaging is done |
| Time elapsed        | Shows the time elapsed since start of test                               |
| Samples acquired    | Shows number of samples acquired   |
| CRC_errors          | Shows number of CRC errors (normally 0, otherwise the user should        |
|                     | consider to reject results data in any analysis)                         |
| Resynch's           | Increments from 0 to a number if any re-synchronisations are needed      |
|                     | in order to re-establish data collections from module                    |

Log to file capability:

- Quad core processor is recommended when measuring on two gyro modules simultaneously
- The size of the log file is only limited by the available space on the storage media in use
- The path for result file storage is defined in the active parameter file
- The program should be run with administrator rights to ensure the creation and storage of the result file



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#### 7.7 **Parameters panel**

Table 8: Parameters panel descriptions.

| Panel unit   | Functionality and description   |
|--|---|
| ===== General parameters =====   |   |
| Password   | Current valid password to be able to edit the parameters list. The password is "stim"   |
| Folder for result-file storage   | Path to storage (e.g. "c:\userdata\test\")  |
| What priority will this program run with   | Instructs the program priority for the PC operation system  |
| What format to use for result files  | ASCII text by default. Can be changed to 8 byte binary  |
| Name of file with language definitions   | Application can be configured with language other than English  |
| ===== Device communication =====<br>IMPORTANT MESSAGE: Always verify<br>hardware connections and COM port settings<br>before trying to connect to the device |   |
| RS422 port # to device 1   | Defining which COM port # to assigned to gyro module # 1  |
| RS422 port # to device 2   | Defining which COM port # to assigned to gyro module # 2  |
| RS422 Bitrate [bit/s]  | RS422 bit rate selection  |
| RS422 Stopbit  | 1 or 2. Default is "1"  |
| RS422 parity   | None, odd or even. Default is "None"  |
| ===== External Hardware =====  |   |
| The GPIB-card # to use   | Interface for external power supply (optional). If card(s) are in use; the first card will be assigned to #0, second to #1, etc. Default value is "0"                             |
| Type of power supply used  | External power supply (optional). Default "None" (not in use).<br>Agilent E3631A, E3633A and E3644A are supported   |
| Interface that the power is connected with   | Interface type for external power supply (optional). Default "None" (not in use). RS232 (for Agilent E3631A only) and GPIB supported  |
| Port or address to power   | GPIB port for external power supply (optional). Default "0" (not in use). Selectable up to 31   |
| Voltage on output of power supply [V]  | Voltage output on external power supply (optional). Default value is 5.1 V. Value should be within the supply voltage range of the gyro module. See product datasheet for details |
| Current limit on output of power [A]   | Current limitation on external power supply (optional). Default value is 1.0 A  |



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#### 7.8 Messages from the program

Messages that the program can display are listed inTable 9:

#### Table 9: Possible messages given by the program.

| #  | Message   | Description  |
|----|---|--|
| 1  | This application is already running!<br>Stop loading of 2. instance | The program is already started, a second instance will not be allowed  |
| 2  | Wrong password entered!   | The password entered does not match the required one for this INI-file   |
| 3  | No response to message was received                                 | Did not receive the expected response to the sent service-mode command   |
| 4  | There is no measurement data available for storage                  | To be able to save measurement data, there must be data available  |
| 5  | Unable to open the selected file                                    | Saving of measurement data failed, unable to open or create the selected file  |
| 6  | Unable to allocate the required memory                              | Failed to acquire the requested number of datagrams<br>from the gyro module due to error when trying to<br>allocate memory for temporary storage   |
| 7  | No product identification datagram received                         | Even after retries the, expected datagram is not received as response to command sent  |
| 8  | No configuration datagram received                                  | Even after retries the, expected datagram is not received as response to command sent  |
| 9  | No serial number datagram received                                  | Even after reties the, expected datagram is not received as response to command sent   |
| 10 | No datagrams received   | Failed to acquire the requested number of datagrams from the gyro module, no recognizable datagrams received   |
| 11 | Turn off device supply voltage                                      | Instruction to user when running without controlled power-supply   |
| 12 | Turn on device supply voltage                                       | Instruction to user when running without controlled power-supply   |
| 13 | Error encountered when trying to control voltage                    | Power on sequence failed. Note that for the software to<br>be able to read the special datagrams on power-on, the<br>power supply must be applied exactly when instructed<br>as described in previous chapters |
| 14 | Unexpected DG-ID received !   | When waiting for datagrams, unexpected datagrams are received  |
| 15 | Unable to read config DG to determine output unit !                 | Unable to read configuration datagram to determine the output unit   |
| 16 | Unable to synch with DG-stream !                                    | Failed to acquire the requested number of datagrams from the gyro module, unable to get in synch with datagram stream  |
| 17 | Error encountered when trying to print, check configuration !       | Failed to print the graph, check that a printer is configured  |



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| 18  | Unable to create result-folder specified by parameter !   | The specified pathname cannot be created, either due to access-rights or errors in the path specification   |
|-----|---|---|
| 19  | Unable to enter service-mode !  | Unable to enter service-mode, does not receive expected response to command.  |
| 20  | Unable to save parameters to active INI-file !  | Error encountered when trying to save parameters onto INI-file  |
| 21  | Edit-mode of parameters is active, unable to exit !   | The edit-mode of parameters are active, unable to exit the program until edit mode is ended   |
|     | You are about to change the RS422 bit rate.<br>If are you using the USB kit hardware provided by<br>Sensonor, please notice that you will not be able to<br>communicate with the device if you change to something<br>else than supported 460800 b/s!<br>For the PCI card there are no worries - it supports all<br>available bit rates | A warning to the user about limitations for certain RS422<br>hardware   |
| 1/3 | Unable to create/save to selected file, check access rights to folder   | Unable to open or create the specified file in the selected folder, try another filename and/or location. The reason may be lacking access rights to the folder, or illegal filename format |
| 24  | Unsupported datagram received   | When trying to read datagrams into memory a datagram type not supported by the EVK is detected  |