ELECTRONICS & DEFENSE

# STIM320
# STIM380H

## Evaluation kit
## User Manual


## Table of contents:

# 1 EVK features

- PCI kit:
  - PCI / PCIe connectivity to PC
- USB kit:
  - USB connectivity to PC
- Up to 2000Hz sampling rate supported
- Temperature measurements supported
- Service mode and Utility mode access
  - Full IMU information
  - Full IMU configuration capability
  - Detailed IMU diagnostics
  - Help section
- Measure panel
  - 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 IMUs simultaneously supported (requires additional interfaces and/or cables)

***STIM320/STIM380H EVK** PCIe*

*STIM320/STIM380H EVK USB*

## 1.1 General description

The evaluation kit provides measurement and configuration access to STIM320/STIM380H IMU. Configuration, graphical result presentation and saving data to file functions are supported. The single voltage supply required for the IMU operation is provided from an USB port.

**Important notice!**
The USB kit supports certain distinct bit rates only. The following bit rates have been tested and verified:

| Approved bit rates w/USB kit |
|---|
| 3 000 000 bps |
| 2 000 000 bps |
| 1 500 000bps |
| 1 411 765 bps |
| Most settings below 1 300 000 bps |

*Table 2 Valid bit rates*

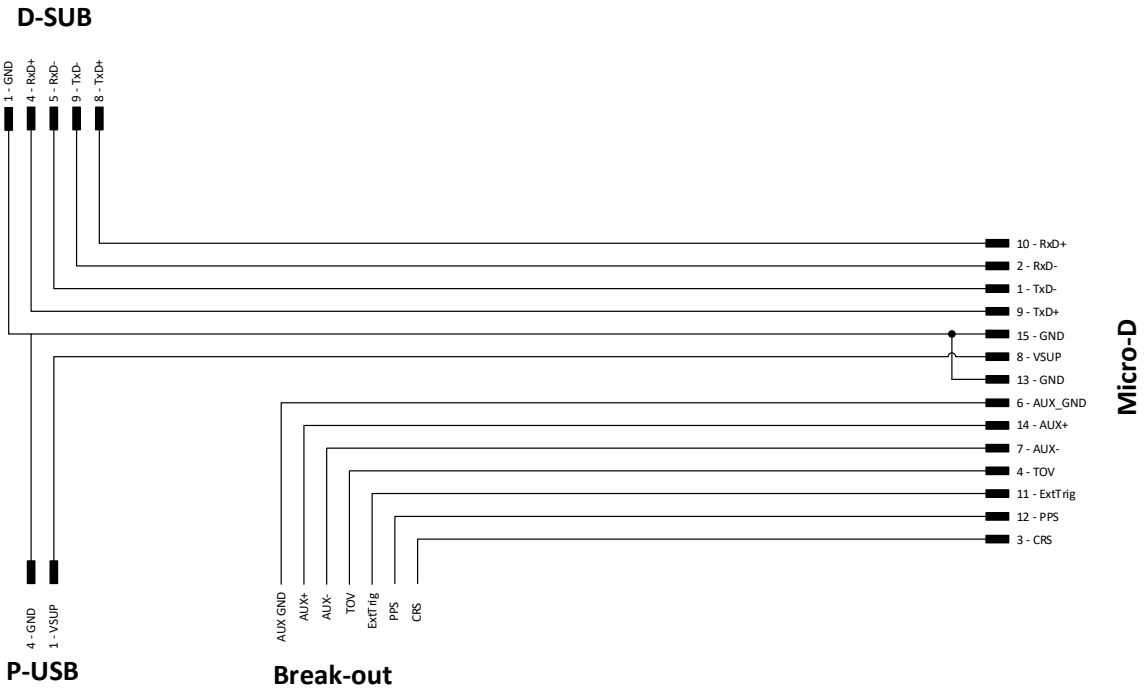



*Figure 1: Wiring diagram, PCIe kit*

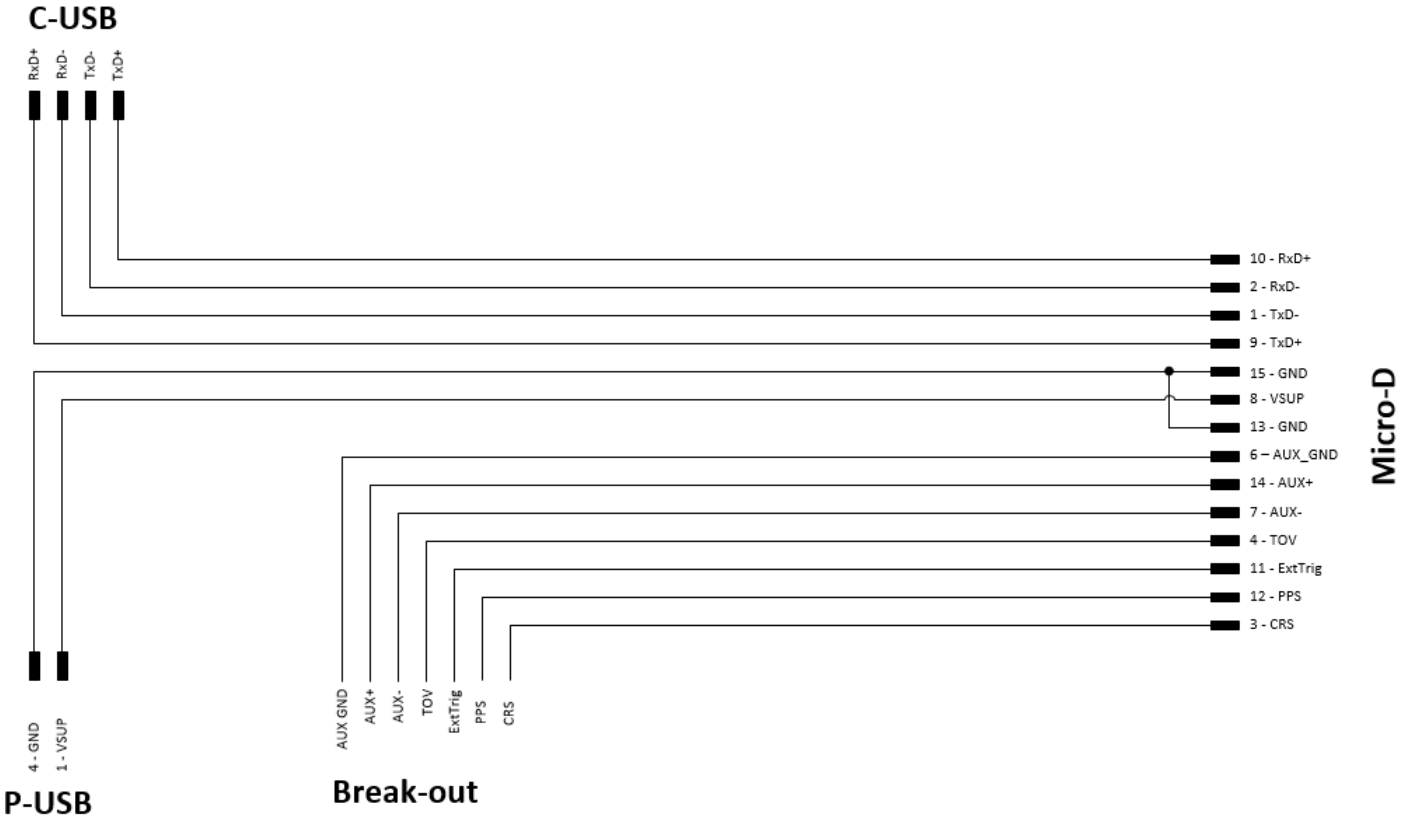



*Figure 2: Wiring diagram, USB kit*

### 1.2 Configurable and readable parameters

Configurable parameters in Service Mode and Utility Mode:

- Output format (angular rate, increment angle etc.)
- Bias Trim Offset parameters
- 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
- IMU 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 STIM320/STIM380H are not supported by the EVK PC-software.

## 2 Kit contents

- PCI/PCIe kit:
  - PCIe to RS422 interface card
  - STIM320/STIM380H communication and power cable
- USB kit:
  - USB to RS422 interface cable with USB power supply connector
- Memory stick with:
  - PC software
  - User manual (this) for evaluation kit
- Tool for fixing connector of communication and power cable to the IMU

Note that the evaluation kit does not include a STIM320/STIM380H IMU. This must be ordered separately.

## 3 System requirements

- Windows XP SP2 (or later), Windows Vista, Windows 7 (32/ 64bit) , Windows 10 (32/ 64bit)
- PCI/PCIe kit:
  - 1 free USB port and 1 free PCIe slot
- USB kit:
  - 2 free USB ports
- Quad core processor recommended (when simultaneously logging data from two or more IMUs)

## 4 Getting started

Depending on the version of evaluation kit, preparing your system involves the following steps:

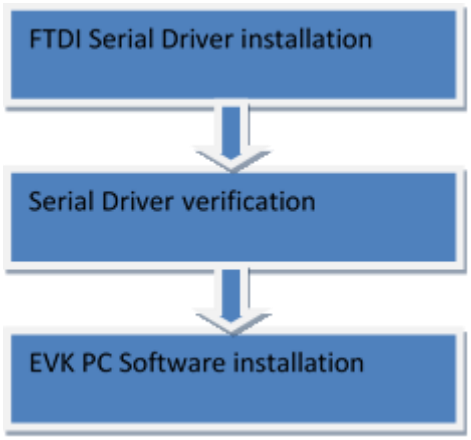



**Figure 3: Installation USB**

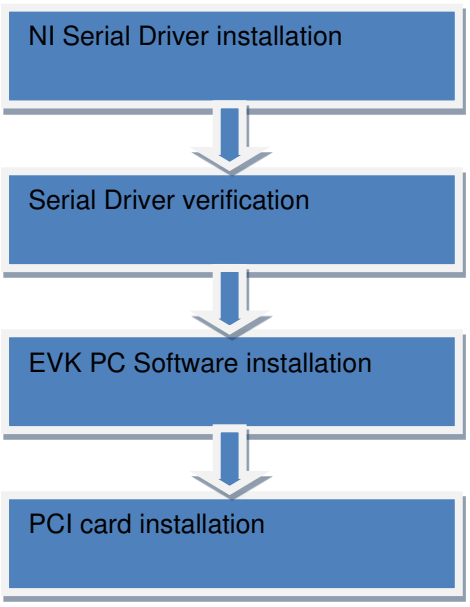



**Figure 4: Installation, PCIe**

### 4.1 PCIe installation

#### 4.1.1 Installation of PCIe to RS422 serial driver

Install the serial driver from the memory stick included in the kit. This procedure is self-instructive. Follow the on-screen messages without doing any configuration changes.

*Figure 5* and *Figure **6*** show two of the messages that appear during serial driver installation.

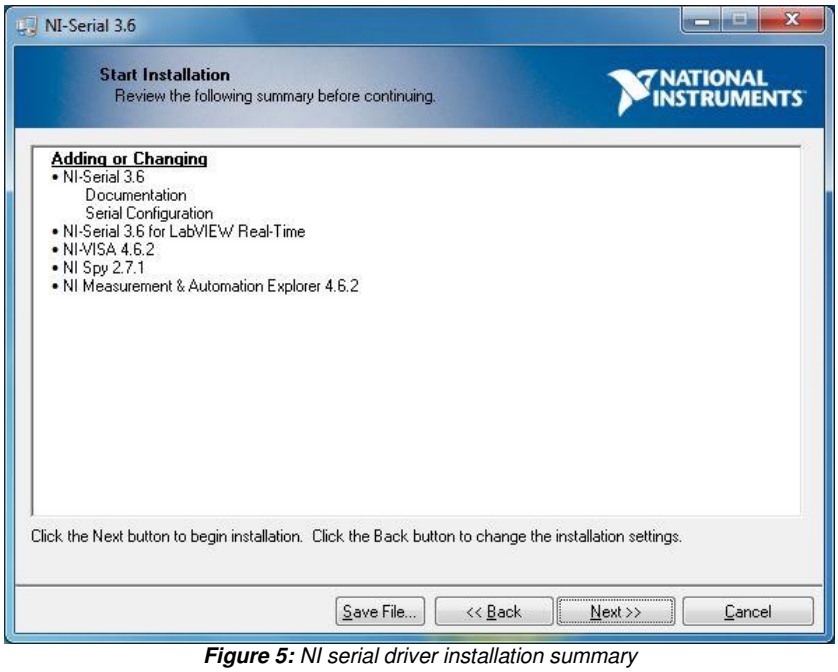



***Figure 5:*** *NI serial driver installation summary*

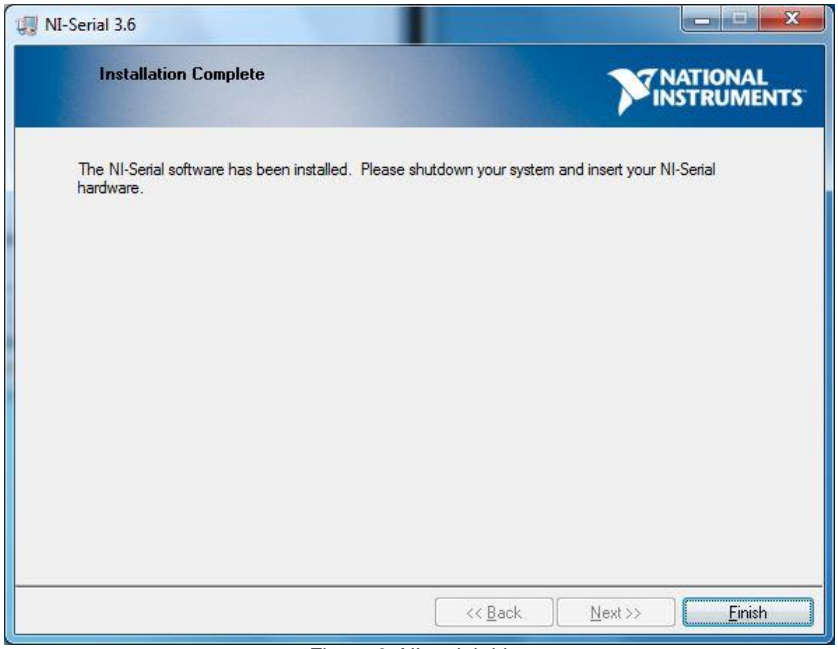
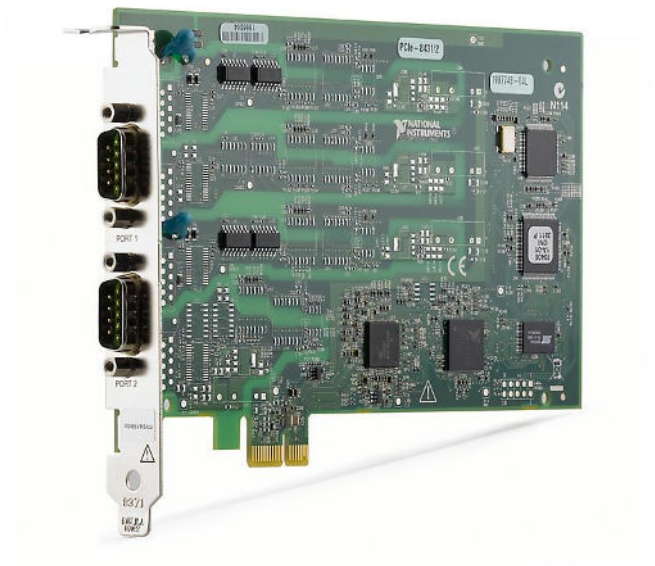



*Figure 6: NI serial driver*

### 4.1.2 Installation of PCIe card



Disconnect power from your computer prior to installation.

Following your computer manufacturer's directions, insert the card into a free PCIe slot.

### 4.1.3 Verification of serial driver set-up

Launch **Device Manager:** *Start -> Control Panel -> Hardware and Sound -> Devices and Printers -> Device Manager*.

Verify that the serial driver installation has completed successfully. An example is shown in *Figure **7***.

Make a note of the assigned COM port value(s) information. This will be needed later for connecting to the STIM320/STIM380H from the PC software.

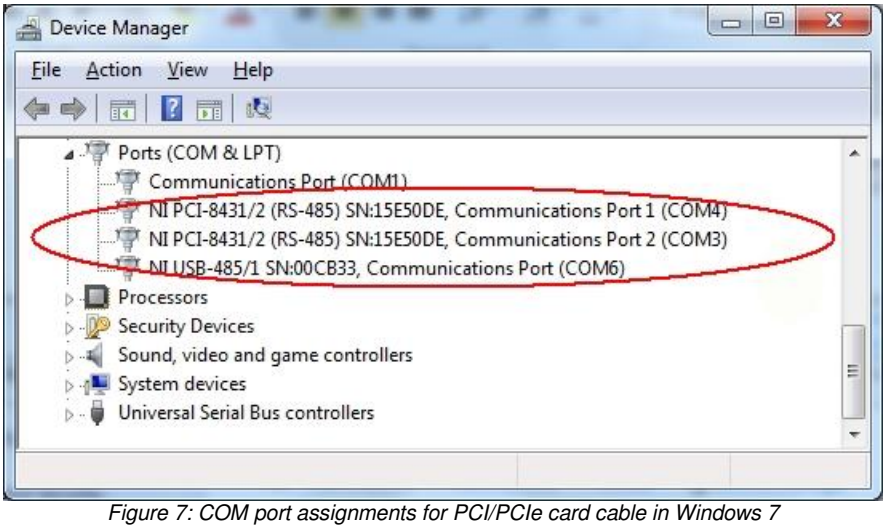



*Figure 7: COM port assignments for PCI/PCIe card cable in Windows 7*

## 4.2 USB installation

### 4.2.1 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: http://www.ftdichip.com/Support/Documents/InstallGuides.htm

### 4.2.2 Connecting the USB EVK to your PC

Figure 8 shows how to connect the EVK to a PC

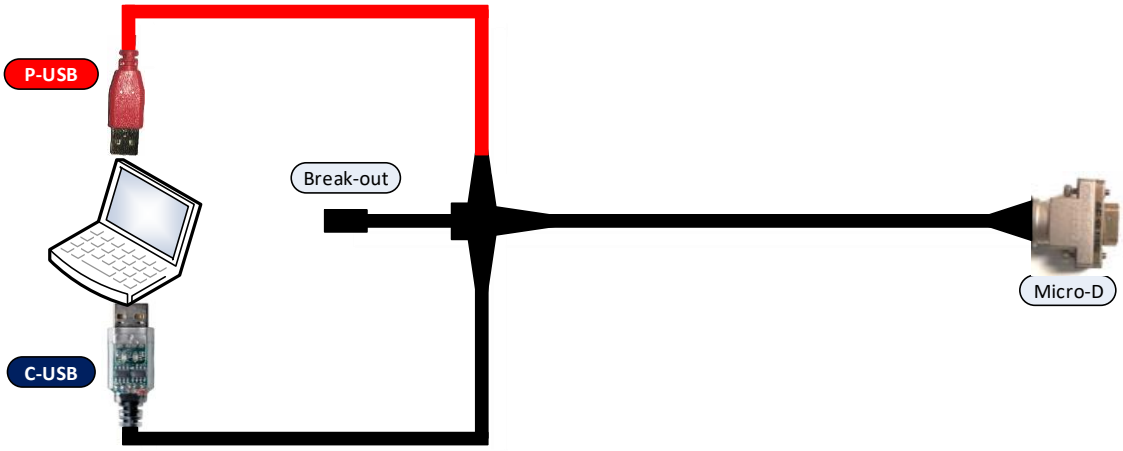



*Figure 8: Connecting the EVK to a computer.*

### 4.2.3 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:

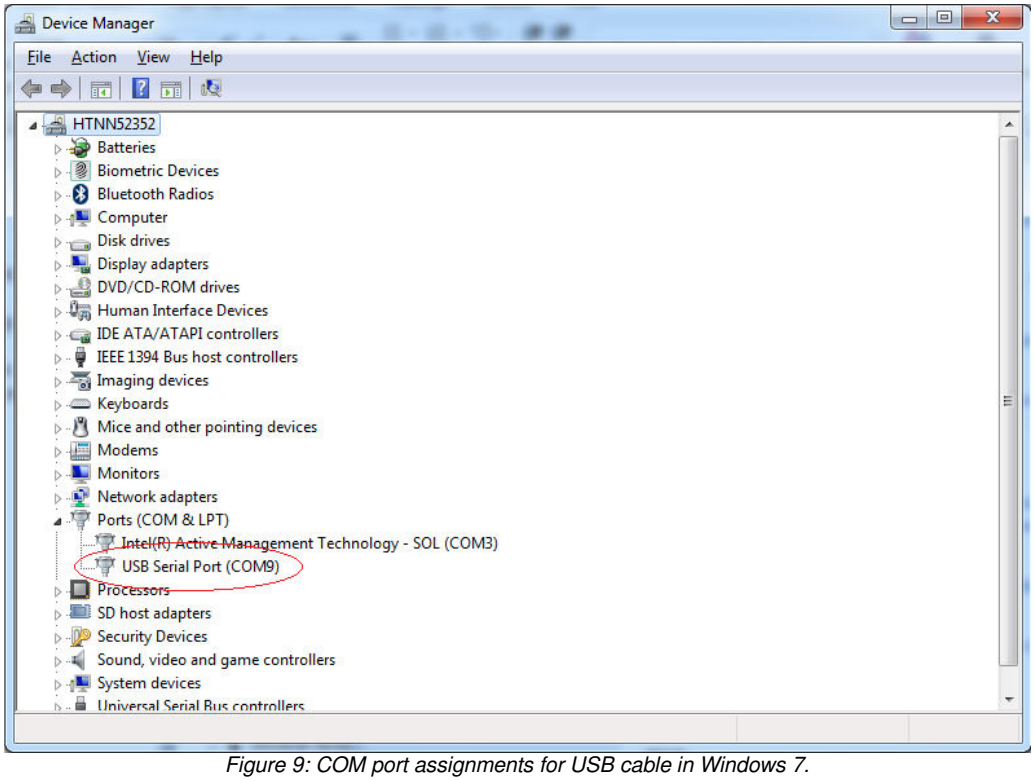



*Figure 9: COM port assignments for USB cable in Windows 7.*

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

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

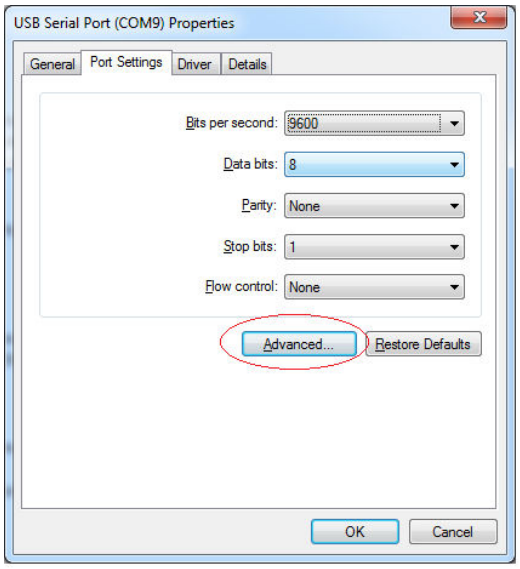



*Figure 10: COM port properties*

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

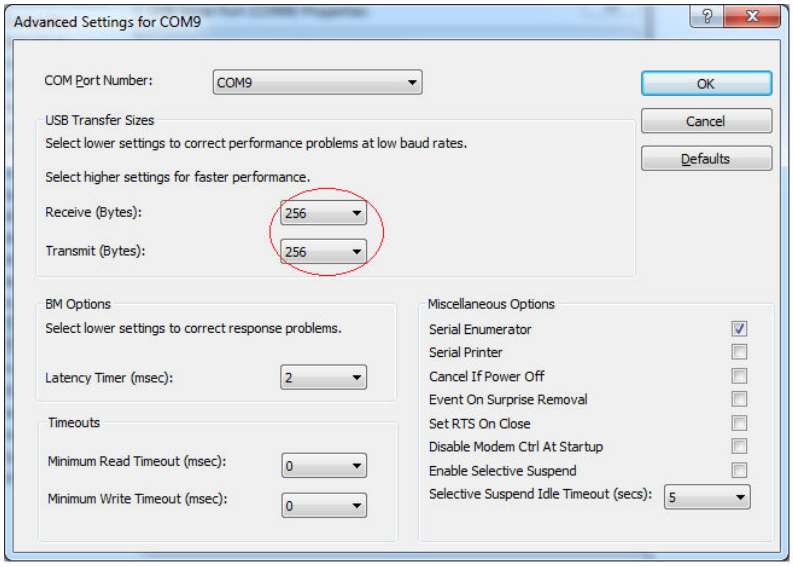



*Figure 11: Settings for COM port*

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.

### 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 can also be downloaded from the STIM product support site. Check this site regularly for updates.

## 5 Connecting the STIM320/STIM380H to your PC

Figure 12 (PCIe) and *Figure **13*** shows how to connect the STIM320/STIM380H to a PC

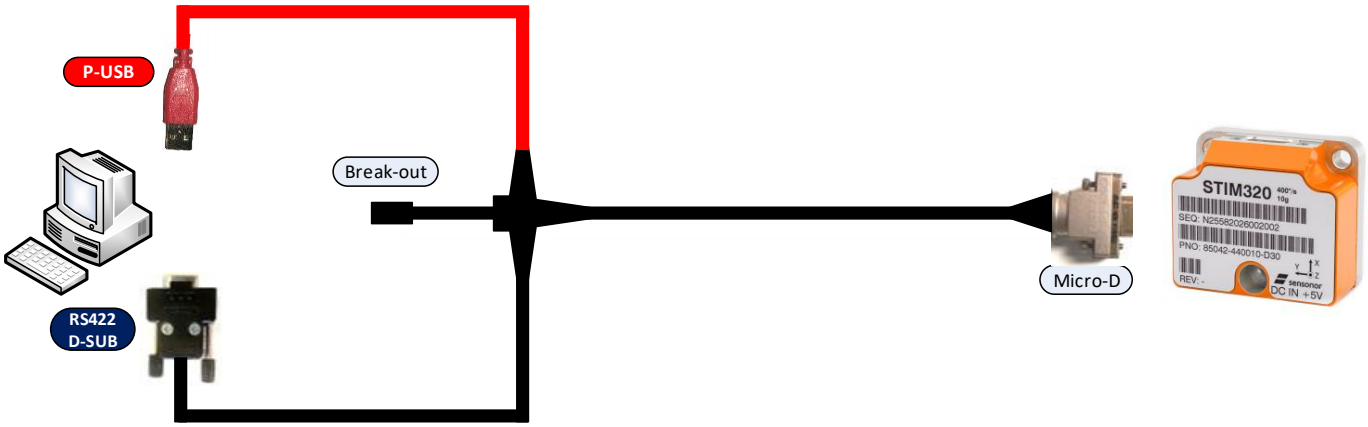



*Figure 12: Connecting the STIM320/STIM380H to a computer via PCIe*

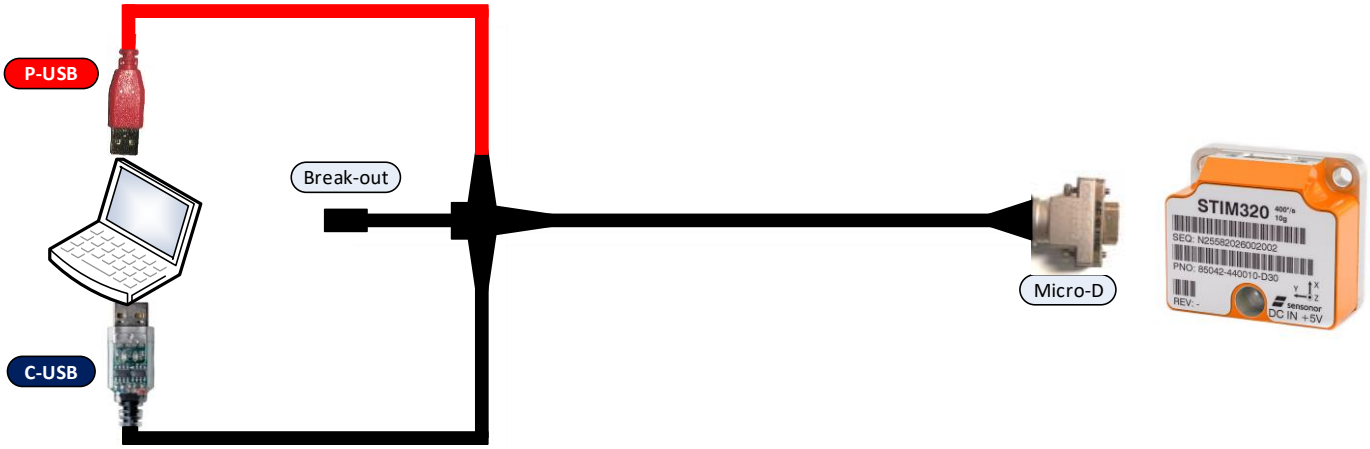



*Figure 13: Connecting the STIM320/STIM380H to a computer via USB*

## 6 Using PC software

1. Navigate to the 'STIM evaluation tools' folder from Windows start menu. Click on the shortcut named "STIM320 STIM380H EVK" to start the PC software. For full functionality, the computer user should have Local Administrator rights.

2. A pop-up window will ask for a parameter (.INI) file. Select the INI-file (available in the installation folder by default) and press "Load"

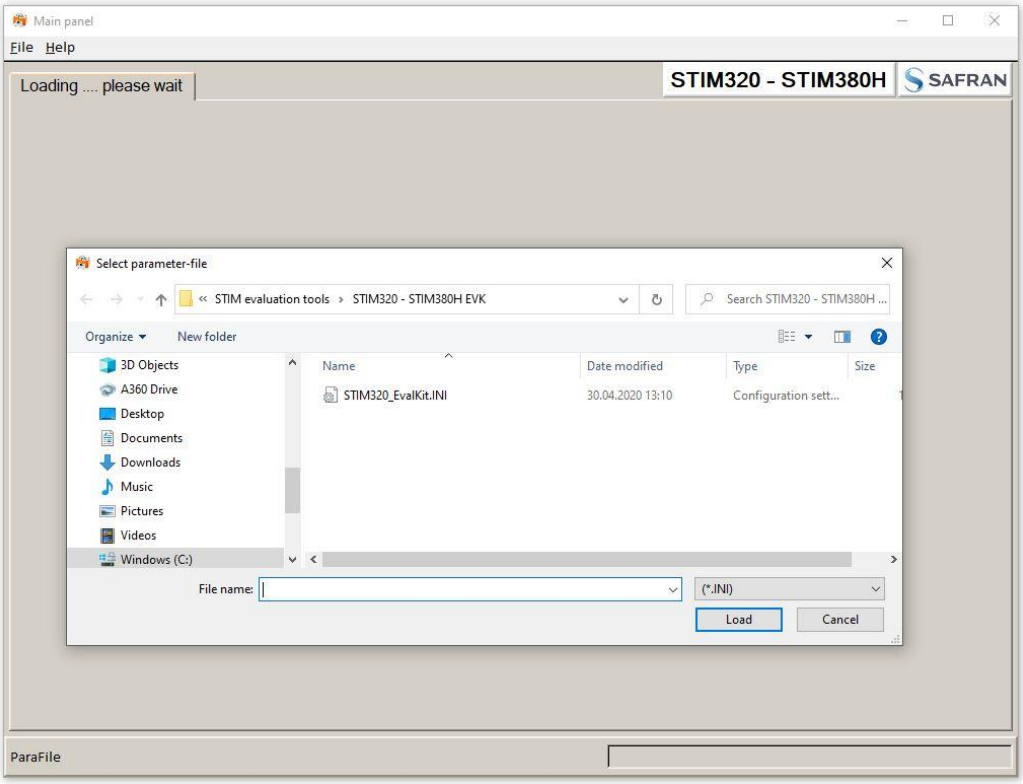



*Figure 14: INI-file selection*

3. A pop-up window containing the End User License Agreement appears. Click the “Accept” button to accept the agreement and enable the EVK software to have full functionality.

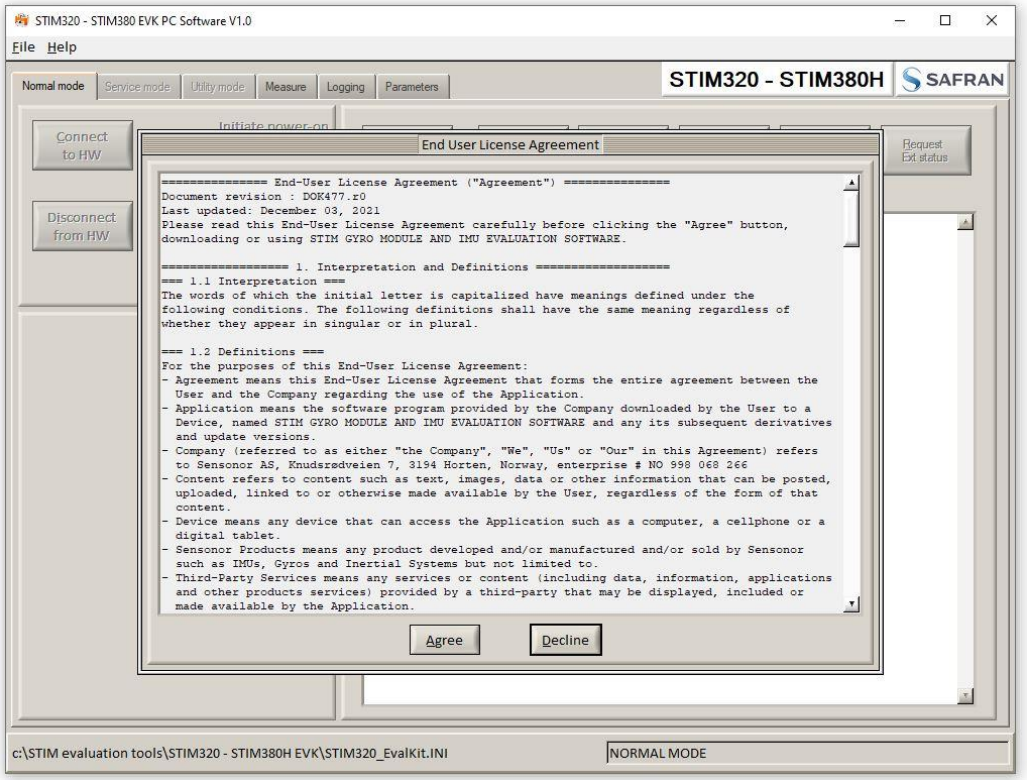



*Figure 15: EULA confirmation window*

4. 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 for support issues). This step will only have to be completed once.

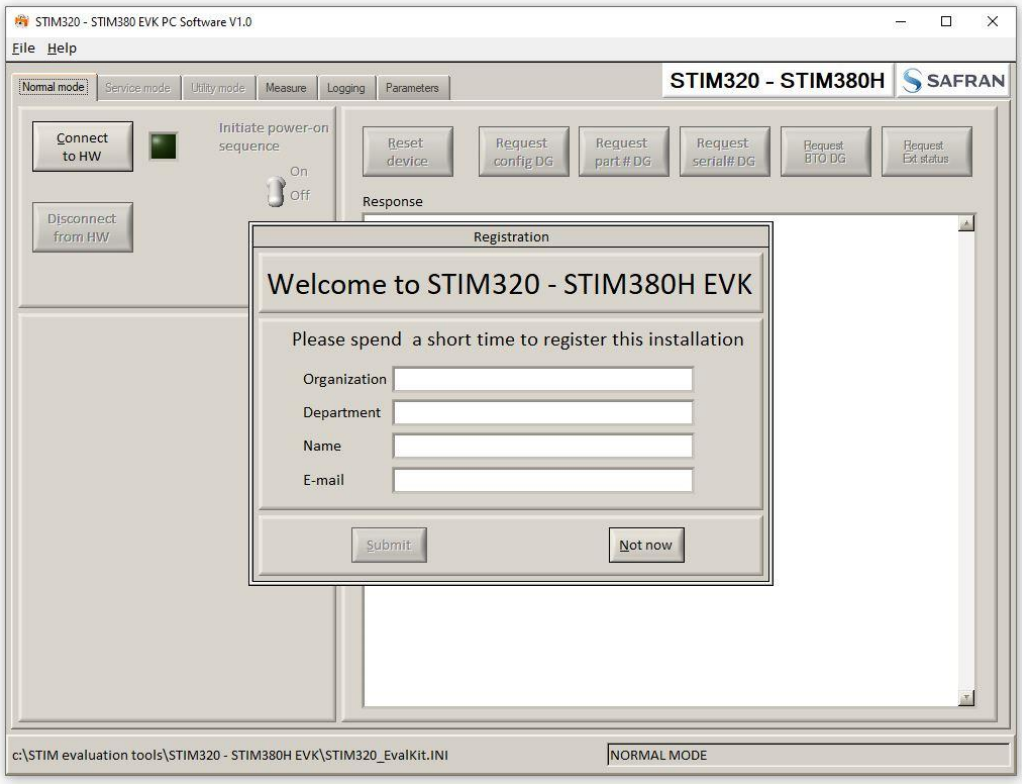



*Figure 16: Welcome message and software registration*

5. The Normal mode panel is shown

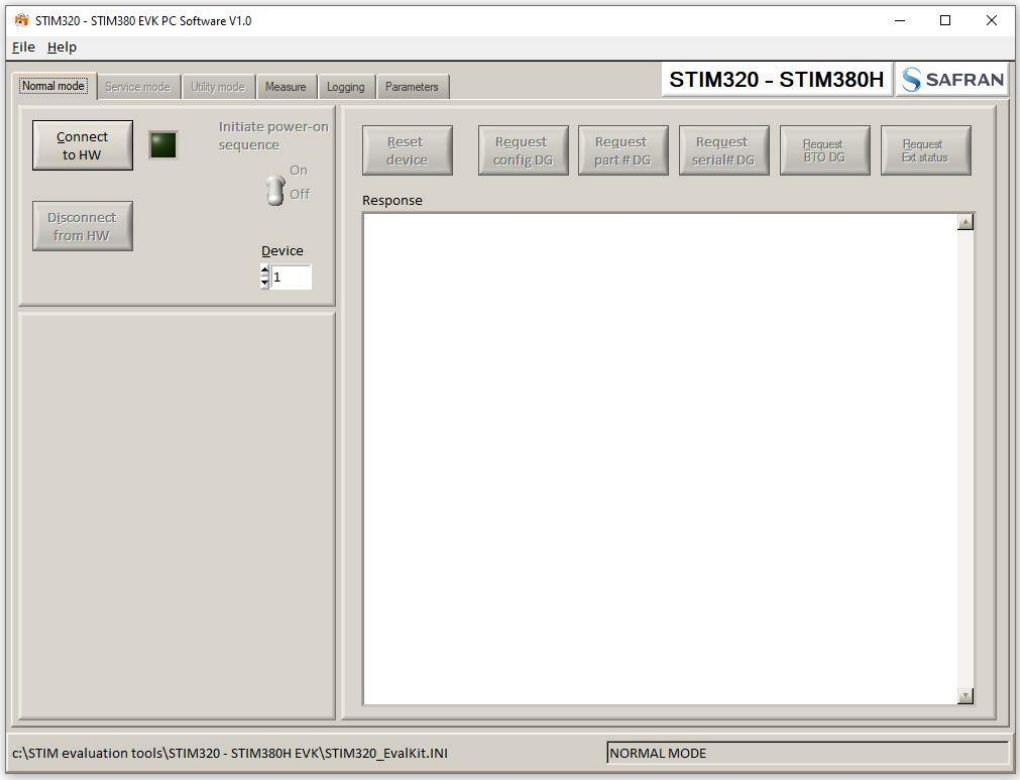



*Figure 17: Normal mode panel after selecting INI-file*

6. Verify the correct COM port settings in the Parameters view. If 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’.

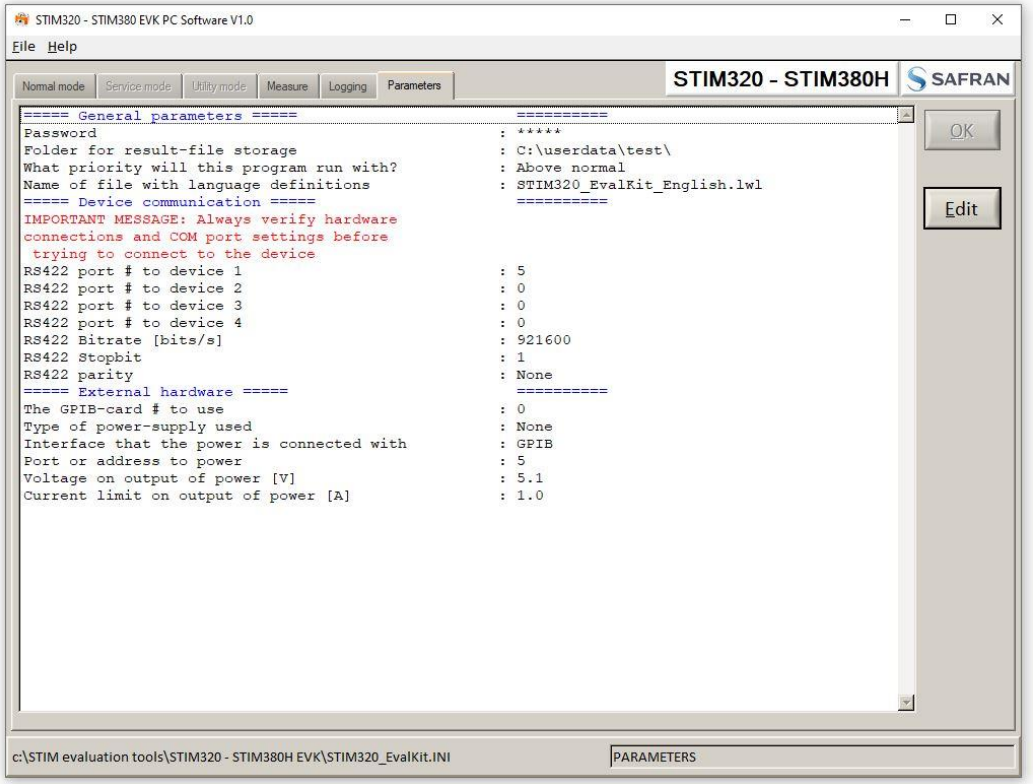



*Figure 18: Edit the INI-file in order to verify correct COM port settings*

7. From the Normal mode panel, connect to and open the COM port by pressing the ‘Connect to HW’ button. A green LED light indicates that the COM port is active. If LED is red, the COM port (specified in the Parameters tan) could not be accessed and/or configured correctly

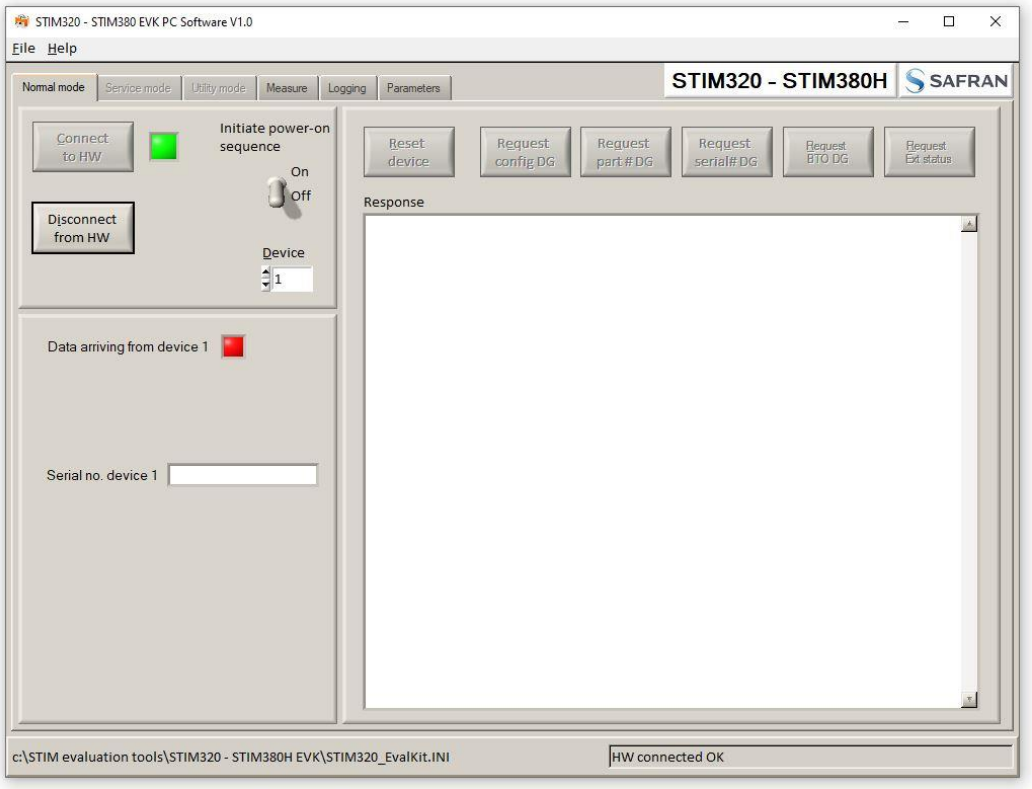



*Figure 19: Normal mode panel after first hardware connection*

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

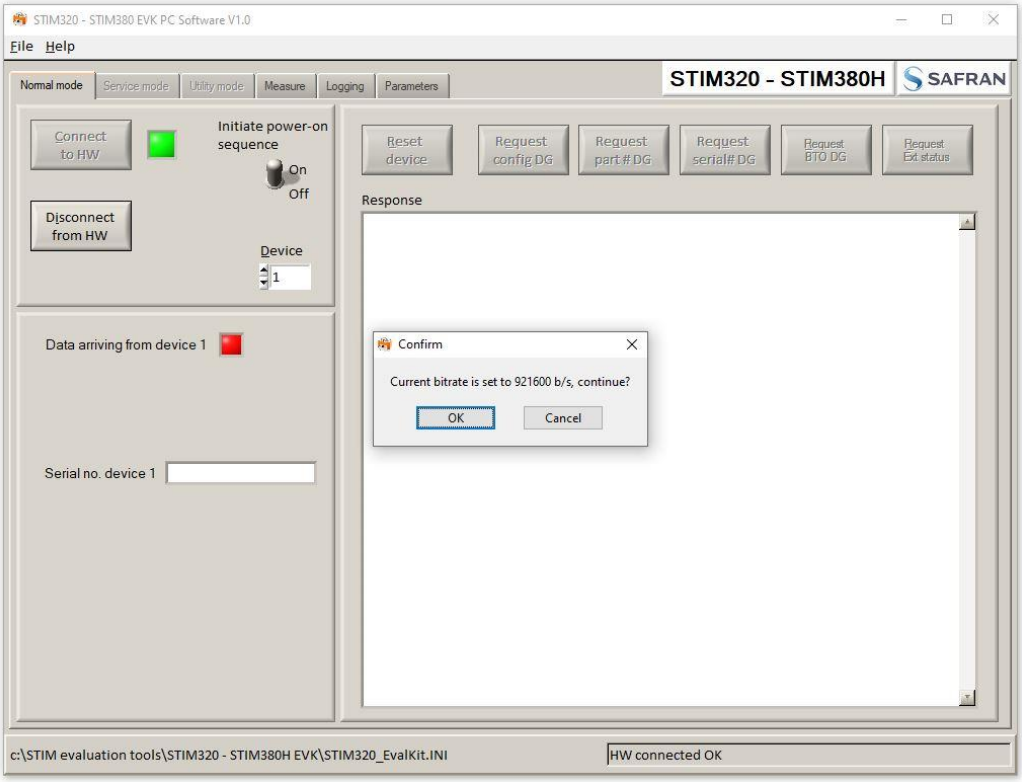



*Figure 20: Confirmation of bitrate*

9. 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’

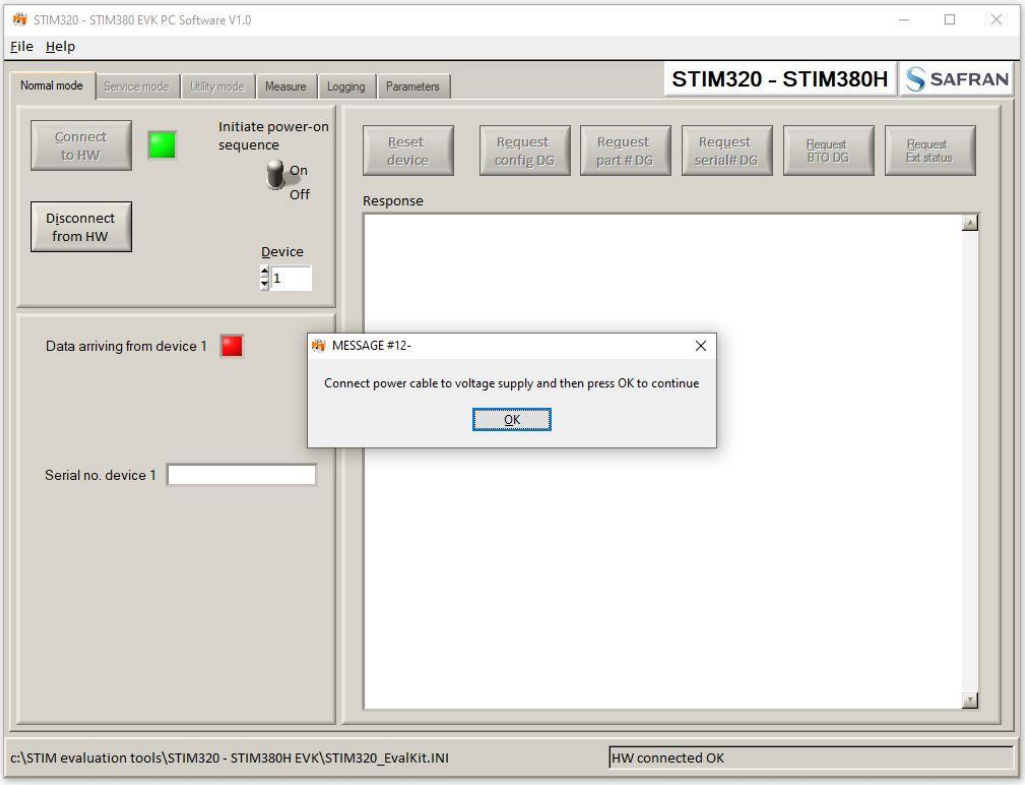



*Figure 21: Confirm power supply is switched on*

10. A green LED (Data arriving from device n) indicates that data is received from the IMU(s). Verify the communication to module by clicking on the 'Request serial# DG' button. An example of such a result is shown in Figure 17. The system is now ready for use.

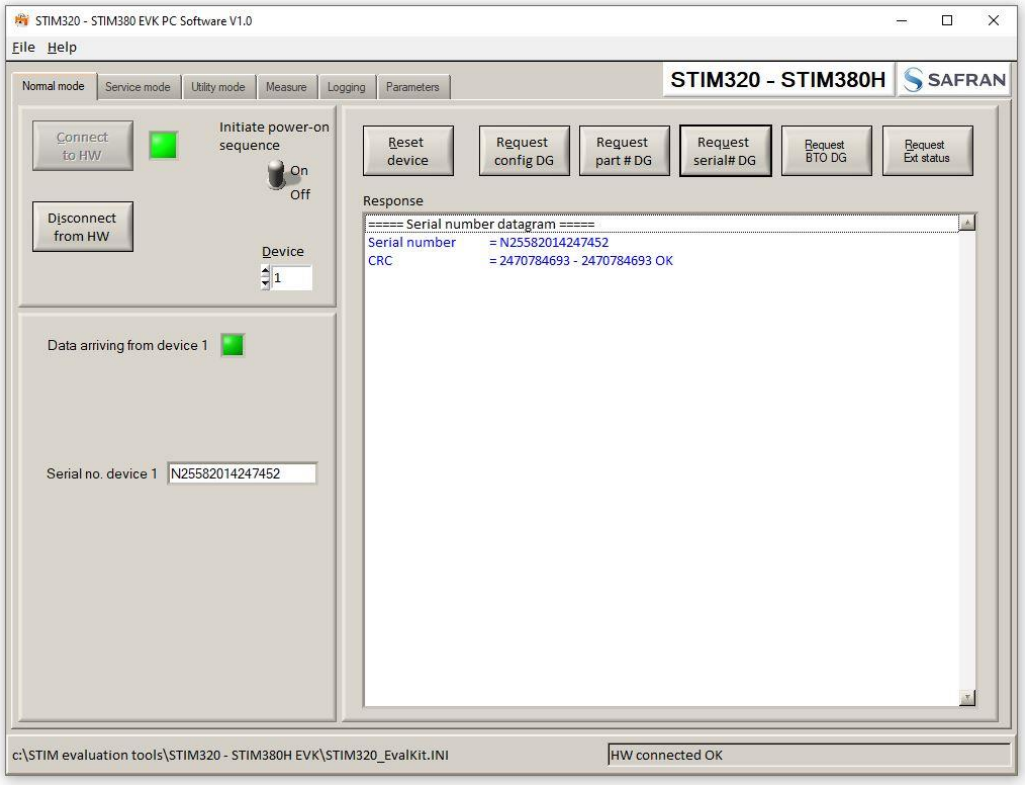



*Figure 22: Example of 'Request serial# DG' response*

# 7 Introduction to PC software

## 7.1 Panels overview

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

### 7.1.1 Service mode panel

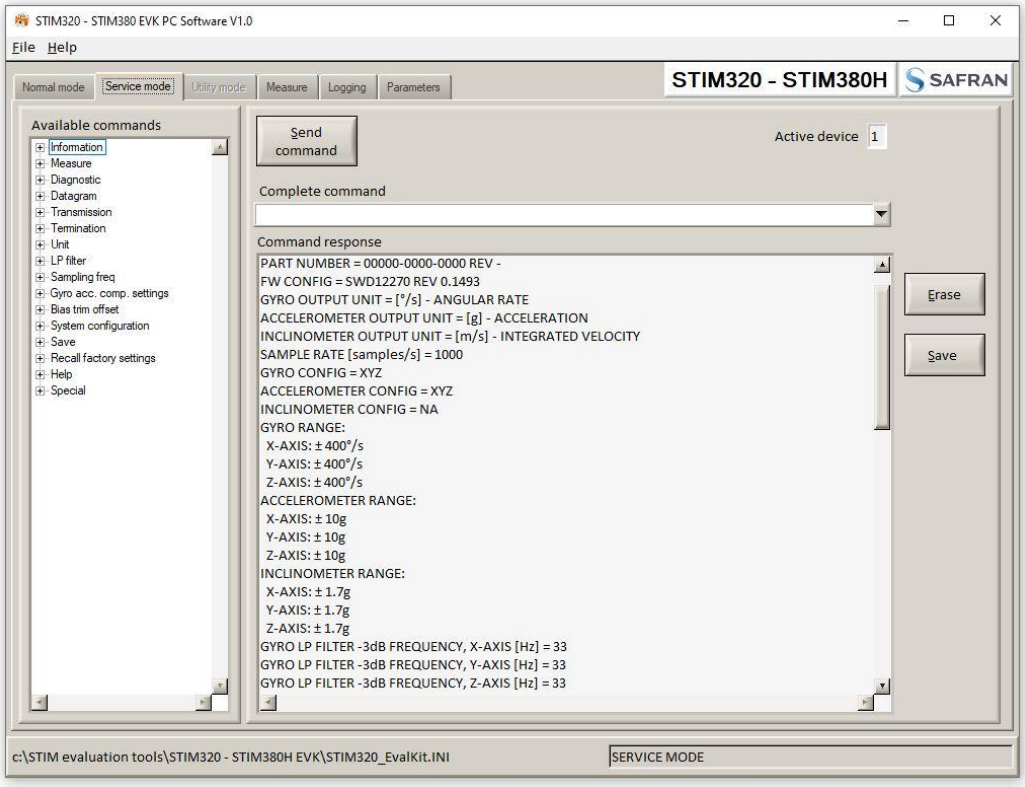



*Figure 23: Service mode panel*

### 7.1.2 Utility mode panel

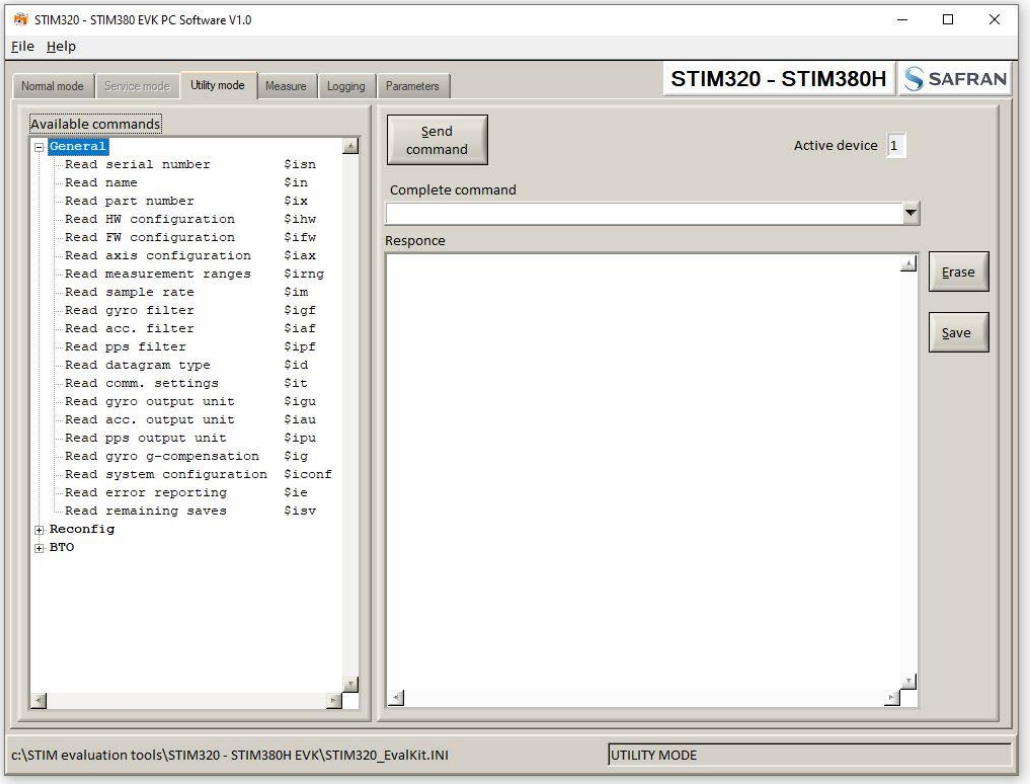



*Figure 24: Utility mode panel*

### 7.1.3 Measure panel


*Figure 25: Measure panel*

### 7.1.4 Logging panel

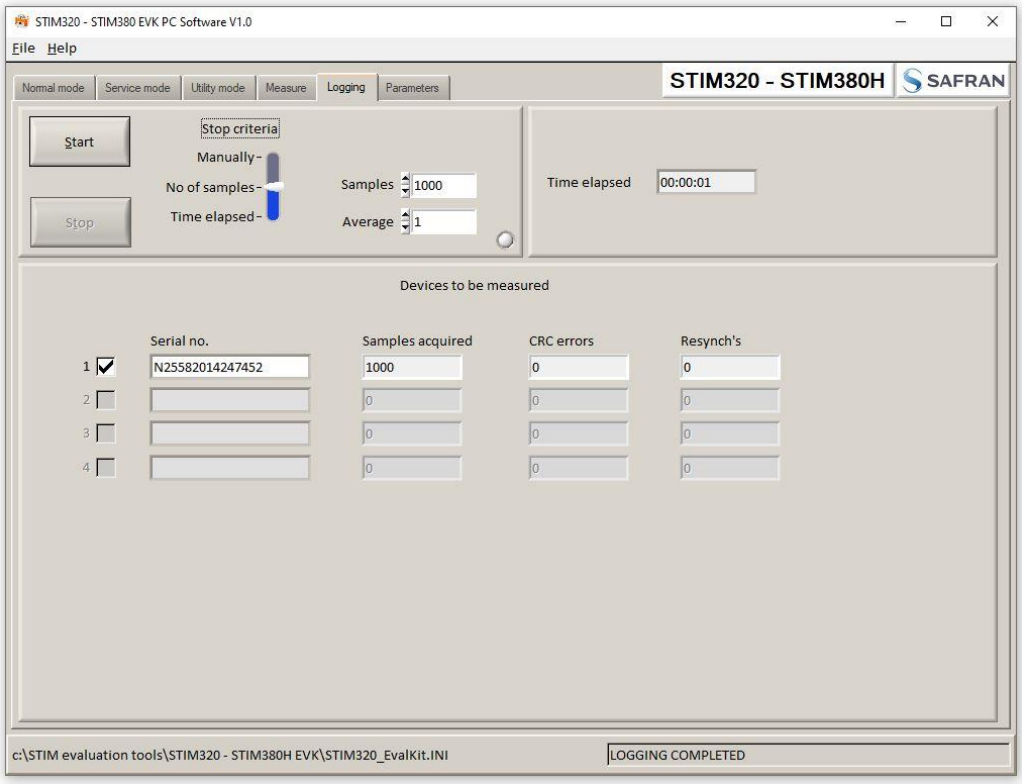



*Figure 26: Logging panel (for saving data to file)*

### 7.2 Main panel menu

| Menu | Description |
|---|---|
| *'File' → '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 IMU configuration settings. |
| *'File' → 'Open parameter file'* | For loading an existing INI-file |
| *'File' → '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' → 'Exit'* | Exit program |
| *'Help' → 'Check for updates'* | Opens the application 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) |
| *'Help' → 'License agreement* | Displays the EULA |

*Table 3: Menu contents*

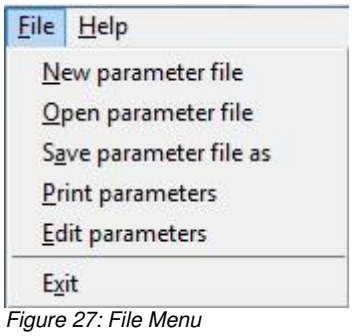



*Figure 27: File Menu*

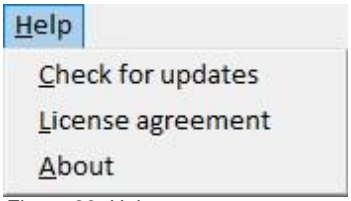



*Figure 28: Help menu*

### 7.3 Normal mode panel descriptions

| Panel content | 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 opened |
| Disconnect from HW | Disconnects from interface hardware. Closes the COM port |
| Apply voltage switch (On/Off) | Toggles supply voltage if connected to an external power supply. Controls certain functions of the PC software. |
| Device box | Device number (and corresponding COM port) according to active parameter file. Selects which IMU is activated for datagram requests in Normal mode, Service mode operations and measurements in Measure panel. Does not apply for Logging panel. |
| Reset device button | Resets the IMU. 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) |

*Table 4: Normal mode panel descriptions*

### 7.4 Service mode panel descriptions

Service mode is used for IMU configuration.

Service mode is entered by clicking on the Service mode tab next to the Normal mode tab after the IMU has been powered up. Service mode usage, functionalities and descriptions are listed in *Table 5*. 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 IMU in Service mode are only stored permanently in flash memory when the save command ('s') subsequently is sent to the IMU.

| Panel content | 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 the software during usage of the listings in the Available commands window. Left click inside the Complete command window brings up a list of previously sent commands. Right click enables manual command entry |
| Send command button | Sends command to the IMU |
| Active device indicator | Indicates active IMU. Corresponding COM port is specified in the active parameter file |
| Command response window | Shows the responses to commands from the IMU. 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 |

*Table 5: Service mode panel descriptions*

### 7.5 Utility mode panel descriptions

Utility mode is used for configuration and communication with the STIM320/STIM380H through a machine-to-machine interface.

Utility mode is entered by clicking on the Utility mode tab after the IMU has been powered up. Utility mode usage, functionalities and descriptions are listed in *Table **6***. Exit from Utility mode by selecting any available panel tab.

Note: Changes made to the IMU in Utility mode are permanently only when the settings are saved to flash memory.

| Panel content | 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 the software during usage of the listings in the Available commands window. Left click inside the Complete command window brings up a list of previously sent commands. Right click enables manual command entry |
| Send command button | Sends command to the IMU |
| Command response window | Shows the responses to commands from the IMU. 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 |

*Table 6: Utility mode panel descriptions*

### 7.6 Measure panel descriptions

| Panel content | Functionality and description |
|---|---|
| Measure button | Starts a measurement series |
| Samples box | Defines the number of samples to be collected (max 50 MS) |
| 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 switch | When set to 'Absolute', all results are plotted as received. When set to 'Relative' the curves are translated so that the first measurement is shown in the plot as zero. |
| Active device indicator | Indicates active IMU. 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) |

*Table 7: Measure panel description*

Saved data:
An example of a result file is shown in *Figure **29***, for a standard datagram measurement series of IMU # 1. A description of each of the columns of the data log file is found in the table that follows.

N25582118273887_20211217_141948_1.txt - Notepad

File Edit Format View Help

```
==============================================
Serial no       N25582118273887
Sample rate     1000
Gyro unit       0
Gyro BW X       33
Gyro BW Y       33
Gyro BW Z       33
Gyro range X    0
Gyro range Y    0
Gyro range Z    0
Averages        1
==============================================
```

| DG_# | GYRO_X | GYRO_Y | GYRO_Z | GyroSts | Counter | Latency | RxCRC | CalCRC | DG_ID | Device_ID | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -0.0276489 | -0.0139771 | 0.0252075 | | 0 | | 0 | 117 | 500 | 2794491697 | 2794491697 | 213 | 2 |
| 2 | -0.0280151 | -0.0112915 | 0.0231323 | | 0 | | 0 | 119 | 500 | 1084588729 | 1084588729 | 213 | 2 |
| 3 | -0.0288086 | -0.0087891 | 0.0188599 | | 0 | | 0 | 121 | 500 | 2368679544 | 2368679544 | 213 | 2 |
| 4 | -0.0299072 | -0.0073853 | 0.0122070 | | 0 | | 0 | 123 | 500 | 2309399620 | 2309399620 | 213 | 2 |
| 5 | -0.0308228 | -0.0064697 | 0.0049438 | | 0 | | 0 | 125 | 500 | 175518745 | 175518745 | 213 | 2 |
| 6 | -0.0316772 | -0.0059814 | -0.0014038 | | 0 | | 0 | 127 | 500 | 1841377271 | 1841377271 | 213 | 2 |
| 7 | -0.0317383 | -0.0057983 | -0.0065918 | | 0 | | 0 | 129 | 500 | 3900225079 | 3900225079 | 213 | 2 |
| 8 | -0.0307007 | -0.0059814 | -0.0100098 | | 0 | | 0 | 131 | 500 | 1027781297 | 1027781297 | 213 | 2 |
| 9 | -0.0293579 | -0.0057983 | -0.0112305 | | 0 | | 0 | 133 | 500 | 957878464 | 957878464 | 213 | 2 |
| 10 | -0.0284424 | -0.0054321 | -0.0129395 | | 0 | | 0 | 135 | 500 | 4070629902 | 4070629902 | 213 | 2 |
| 11 | -0.0274658 | -0.0058594 | -0.0130615 | | 0 | | 0 | 137 | 500 | 968519156 | 968519156 | 213 | 2 |
| 12 | -0.0264282 | -0.0059814 | -0.0110474 | | 0 | | 0 | 139 | 500 | 3665712327 | 3665712327 | 213 | 2 |
| 13 | -0.0260010 | -0.0056763 | -0.0083618 | | 0 | | 0 | 141 | 500 | 2811358454 | 2811358454 | 213 | 2 |
| 14 | -0.0276489 | -0.0060425 | -0.0061035 | | 0 | | 0 | 143 | 500 | 1368144494 | 1368144494 | 213 | 2 |
| 15 | -0.0314941 | -0.0066528 | -0.0052490 | | 0 | | 0 | 145 | 499 | 2730757076 | 2730757076 | 213 | 2 |
| 16 | -0.0361328 | -0.0068970 | -0.0062256 | | 0 | | 0 | 147 | 500 | 2101461295 | 2101461295 | 213 | 2 |
| 17 | -0.0406494 | -0.0076294 | -0.0099487 | | 0 | | 0 | 149 | 499 | 2514968430 | 2514968430 | 213 | 2 |
| 18 | -0.0445557 | -0.0093994 | -0.0141602 | | 0 | | 0 | 151 | 500 | 3836829137 | 3836829137 | 213 | 2 |
| 19 | -0.0480347 | -0.0115356 | -0.0202637 | | 0 | | 0 | 153 | 499 | 181230090 | 181230090 | 213 | 2 |
| 20 | -0.0508423 | -0.0140991 | -0.0285645 | | 0 | | 0 | 155 | 500 | 3590030129 | 3590030129 | 213 | 2 |
| 21 | -0.0528564 | -0.0166016 | -0.0377808 | | 0 | | 0 | 157 | 499 | 3704369909 | 3704369909 | 213 | 2 |
| 22 | -0.0521240 | -0.0175171 | -0.0475464 | | 0 | | 0 | 159 | 500 | 3567647535 | 3567647535 | 213 | 2 |
| 23 | -0.0487671 | -0.0178223 | -0.0577393 | | 0 | | 0 | 161 | 499 | 394001628 | 394001628 | 213 | 2 |
| 24 | -0.0451660 | -0.0175171 | -0.0673828 | | 0 | | 0 | 163 | 500 | 2352841712 | 2352841712 | 213 | 2 |
| 25 | -0.0413818 | -0.0161743 | -0.0747070 | | 0 | | 0 | 165 | 499 | 3541926785 | 3541926785 | 213 | 2 |
| 26 | -0.0374756 | -0.0137939 | -0.0803833 | | 0 | | 0 | 167 | 500 | 1204092159 | 1204092159 | 213 | 2 |
| 27 | -0.0332031 | -0.0110474 | -0.0836182 | | 0 | | 0 | 169 | 499 | 4022435442 | 4022435442 | 213 | 2 |
| 28 | -0.0294189 | -0.0083008 | -0.0844116 | | 0 | | 0 | 171 | 500 | 2228580671 | 2228580671 | 213 | 2 |
| 29 | -0.0260010 | -0.0065918 | -0.0839233 | | 0 | | 0 | 173 | 499 | 1791856098 | 1791856098 | 213 | 2 |
| 30 | -0.0241089 | -0.0067749 | -0.0819092 | | 0 | | 0 | 175 | 500 | 3038852687 | 3038852687 | 213 | 2 |
| 31 | -0.0233154 | -0.0085449 | -0.0771484 | | 0 | | 0 | 177 | 500 | 4244002256 | 4244002256 | 213 | 2 |
| 32 | -0.0221558 | -0.0122070 | -0.0706787 | | 0 | | 0 | 179 | 500 | 1434643488 | 1434643488 | 213 | 2 |
| 33 | -0.0206909 | -0.0167236 | -0.0644531 | | 0 | | 0 | 181 | 500 | 3382349220 | 3382349220 | 213 | 2 |
| 34 | -0.0194092 | -0.0211182 | -0.0589600 | | 0 | | 0 | 183 | 500 | 1904104271 | 1904104271 | 213 | 2 |
| 35 | -0.0194702 | -0.0247192 | -0.0545044 | | 0 | | 0 | 185 | 500 | 3825140376 | 3825140376 | 213 | 2 |
| 36 | -0.0198364 | -0.0280151 | -0.0512085 | | 0 | | 0 | 187 | 500 | 4109761426 | 4109761426 | 213 | 2 |
| 37 | -0.0200195 | -0.0301514 | -0.0482788 | | 0 | | 0 | 189 | 500 | 3184408615 | 3184408615 | 213 | 2 |
| 38 | -0.0206299 | -0.0303955 | -0.0463257 | | 0 | | 0 | 191 | 500 | 1871787402 | 1871787402 | 213 | 2 |
| 39 | -0.0222778 | -0.0284424 | -0.0468140 | | 0 | | 0 | 193 | 500 | 3583527343 | 3583527343 | 213 | 2 |
| 40 | -0.0259399 | -0.0238647 | -0.0501099 | | 0 | | 0 | 195 | 500 | 46906421 | 46906421 | 213 | 2 |
| 41 | -0.0316772 | -0.0184937 | -0.0552979 | | 0 | | 0 | 197 | 500 | 1904633966 | 1904633966 | 213 | 2 |
| 42 | -0.0381470 | -0.0131226 | -0.0620728 | | 0 | | 0 | 199 | 499 | 35756995 | 35756995 | 213 | 2 |
| 43 | -0.0441895 | -0.0081177 | -0.0704346 | | 0 | | 0 | 201 | 500 | 2969892746 | 2969892746 | 213 | 2 |
| 44 | -0.0493774 | -0.0024414 | -0.0803833 | | 0 | | 0 | 203 | 500 | 1239119086 | 1239119086 | 213 | 2 |
| 45 | -0.0542603 | 0.0033569 | -0.0916748 | | 0 | | 0 | 205 | 500 | 3511756738 | 3511756738 | 213 | 2 |
| 46 | -0.0568848 | 0.0081787 | -0.1043091 | | 0 | | 0 | 207 | 500 | 4134717009 | 4134717009 | 213 | 2 |
| 47 | -0.0563965 | 0.0115967 | -0.1168213 | | 0 | | 0 | 209 | 500 | 3678126905 | 3678126905 | 213 | 2 |

*Figure 29: Result file example, Rate only datagram*

| DG-type | Col. # | Heading | Comments |
|---|---|---|---|
| Standard | 1 | DG_# | Index of datagram |
| | 2 | GYRO_X | Gyro signal X-axis |
| | 3 | GYRO_Y | Gyro signal Y-axis |
| | 4 | GYRO_Z | Gyro signal Z-axis |
| | 5 | GYRO_STS | Status-byte for gyro |
| | 6 | GYRO_TMP_X | Temperature, X-axis gyro |
| | 7 | GYRO_TMP_Y | Temperature, Y-axis gyro |
| | 8 | GYRO_TMP_Z | Temperature, Z-axis gyro |
| | 9 | GYRO_TMP_STS | Gyro temperature status |
| | 10 | ACC_X | Accelerometer signal X-axis |
| | 11 | ACC_Y | Accelerometer signal Y-axis |
| | 12 | ACC_Z | Accelerometer signal Z-axis |
| | 13 | ACC_STS | Status-byte for accelerometer |
| | 14 | ACC_TMP_X | Temperature, X-axis accelerometer |
| | 15 | ACC_TMP_Y | Temperature, Y-axis accelerometer |
| | 16 | ACC_TMP_Z | Temperature, Z-axis accelerometer |
| | 17 | ACC_TMP_STS | Accelerometer temperature status |
| | 18 | PPS | “Time since detection” or “PPS filtered”. See product datasheet for details |
| | 19 | PPS_STS | PPS status |
| | 20 | Counter | Sample counter. See product datasheet for details |
| | 21 | Latency | Sample latency. See product datasheet for details |
| | 22 | RxCRC | Received CRC |
| | 23 | CalCRC | Calculated CRC |
| | 24 | DG_ID | Datagram identifier |
| | 25 | Device_ID | Programmed ID of IMU |

**Table 8: Result file content, full datagram**

### 7.7 Logging panel descriptions

| Panel content | 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 | Used for downsampling of data. Average value of selected number of values is logged to file |
| 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 |

*Table 9: Logging panel descriptions*

Log to file capability:

- Quad core processor is recommended when measuring on two or more IMUs 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

### 7.8 Parameters panel descriptions

| Panel content | Functionality and description |
|---|---|
| ===== General parameters ===== | |
| Password | Current valid password to be able to edit the parameters list. The default 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 ===== IMPORTANT MESSAGE: Always verify hardware connections and COM port settings before trying to connect to the device | |
| RS422 port # to device 1 | Defining which COM port # to assigned to IMU # 1 |
| RS422 port # to device 2 | Defining which COM port # to assigned to IMU # 2 |
| RS422 port # to device 3 | Defining which COM port # to assigned to IMU # 3 |
| RS422 port # to device 4 | Defining which COM port # to assigned to IMU # 4 |
| 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). 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 IMU. 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 |

**Table 10: Parameters panel descriptions**

### 7.8.1 Binary file description

The binary file's first 2101 bytes is the header. The header is defined as:

- The first byte is stating the number of 'columns' in the file (n columns)
- The next 100 bytes is defining the data-type for each 'column' (only the first n values are set). Currently these numbers are all 0x05, meaning 8-byte floating point (double)
- The remaining header bytes are 100 20-byte strings with the header name for each 'column' (only the first n values are set)

After the header follows the data measurement result values, stored as 8-byte floating point values (double) in groups of n results.

## 7.9 Messages from the program

Messages that the program can display are listed in *Table 11*:

| # | 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 from the IMU due to error when trying to 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 IMU, 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 be able to read the special datagrams on power-on, the power supply must be applied exactly when instructed 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 IMU, 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 |
| 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 |
| 22 | You are about to change the RS422 bit rate.<br>If are you using the USB kit hardware provided, please notice that you will not be able to communicate with the device if you change to something else than supported 460800 b/s!<br>For the PCI card there are no worries - it supports all available bit rates | A warning to the user about limitations for certain RS422 hardware |
| 23 | 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 |

*Table 11: Possible messages given by the program*

POWERED BY TRUST

Information furnished by Safran is believed to be accurate and reliable. However, no responsibility is assumed by Safran for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Safran reserves the right to make changes without further notice to any products herein. Safran makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Safran assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. No license is granted by implication or otherwise under any patent or patent rights of Safran. Trademarks and registered trademarks are the property of their respective owners. Safran products are not intended for any application in which the failure of the Safran product could create a situation where personal injury or death may occur. Should Buyer purchase or use Safran products for any such unintended or unauthorized application, Buyer shall indemnify and hold Safran and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable legal fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Safran was negligent regarding the design or manufacture of the part.

**Safran Sensing Technologies Norway AS**
sales@sensonor.com **safran-sensing-technologies.com**