User Manual

English

MuST VII Dynamic

Reading Unit

Engineered by HBM FiberSensing

SMARTEC

MuST VII Dynamic Reading Unit
Equipment User Manual
DynamicMONITOR User Manual

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Reading Unit version: 1.0
DynamicMONITOR Software version: 1.2

Subject to modifications.
All product descriptions are for general information only.
They are not to be understood as a guarantee of quality or durability.

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1 Technical details

1.1 General Information

The MuST VII Dynamic is a continuous swept laser scanning measurement unit for interrogating SOFO and fiber Bragg grating (FBG) sensors. It includes a NIST traceable wavelength reference that provides continuous calibration to ensure system accuracy over long term operation. The high dynamic range and high output power allows high resolution to be attained even for long fiber leads and lossy connections.
Multiple FBG sensors can be connected in series in each optical fiber. This, in combination with the four or eight optical channels with parallel acquisition, make the MuST VII Dynamic particularly suited for large scale sensing networks, acquiring a large number of sensors simultaneously , providing 100S/s acquisition rates with 5 pm resolution.

This Manual applies to the following equipment:

PN S12.2030-1CH
MuST VII Dynamic Reading Unit • 1 OC • Standard Temperature Operation Range
PN S12.2030-4CH
MuST VII Dynamic Reading Unit • 4 OC • Standard Temperature Operation Range

1.2 System Components

The MuST VII Dynamic set includes:
- Measurement Unit
- Power cord
- Adapter protection caps

1.3 MuST VII Dynamic Technical Data

1.3.1 Performance

	MuST /FBG Sensor Measurement
Measurement Resolution	5 pm
Linearity/Accuracy	±10 pm
Measurement Range	100 nm (1500 to 1600 nm)
Calibration	NIST traceable wavelength reference
Measurement time	0.1 s
Available channel count	1 or 4 channels total

1.3.2 Technical Characteristics

AC power supply	230 V 50 Hz / 110 V 60 Hz Auto detect
External connections	Ethernet connection, 1 or 4 optical ports, power supply, display and screen (optional)
Dimensions	500 mm x 500 mm x 210 mm
Weight	~25 Kg
Operating temperature	10 ºC to +40 ºC -40 ºC to + 40 ºC with heating option*
Humidity	90% non-condensed
Protection Index	IP 66†
Dimensions	163mm x 103 mm x 53 mm
Weight	0.43 Kg
Material	Aluminum
Operating temperature	-25 to 70 ºC
Humidity	< 90% at 40 ºC

* optional

† if the base of the Reading Unit is properly drilled and hermetic gland nuts are used.

2 Regulatory and Certification Considerations

2.1 Environment Considerations

2.1.1 Disposal of your Old Appliance

When the attached symbol combination - crossed-out wheeled bin and solid bar symbol – is attached to a product it means the product is covered by the European Directive 2002/96/EC and is applicable in the European Union and other countries with separate collection systems.
All electrical and electronic products should be disposed of separately from the municipal waste stream or household via designated collection facilities appointed by the government or the local authorities. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or distributor that purchased the product.
HBM FiberSensing is a manufacturer registered in the ANREEE - "Associação Nacional para o Registo de Equipamentos Eléctricos e Electrónicos" under number PT001434. FiberSensing celebrated a "Utente" type contract with Amb3E - "Associação Portuguesa de Gestão de Resíduos de Equipamentos Eléctricos e Electrónicos", which ensures the transfer of Electrical and Electronic appliance waste management, i.e. placing Electronic and Electrical appliances in the Portuguese market, from the manufacturer (HBM FiberSensing) to Amb3E.

2.2 Laser Safety

The MuST VII Dynamic product contains a laser in its core. A laser is a light source that can be dangerous to people exposed to it. Even low power lasers can be hazardous to a person's eyesight. The coherence and low divergence of laser light means that it can be focused by the eye into an extremely small spot on the retina, resulting in localized burning and permanent damage.

The lasers are classified by wavelength and maximum output power into the several safety classes: Class 1, Class 1M, Class 2, Class 2M, Class 3R and Class 4.

2.2.1 Symbols

Warning symbol

Class 1 Laser symbol

Fig. 2.1

2.2.2 Class 1 Laser

The MuST VII Dynamic is a class 1 laser product:

«Any laser or laser system containing a laser that cannot emit laser radiation at levels that are known to cause eye or skin injury during normal operation. »

It is safe under all conditions of normal use. No safety requirements are needed to use Class 1 laser devices. This product contains a laser within an enclosure that prevents exposure to the radiation and that cannot be opened without shutting down the laser.

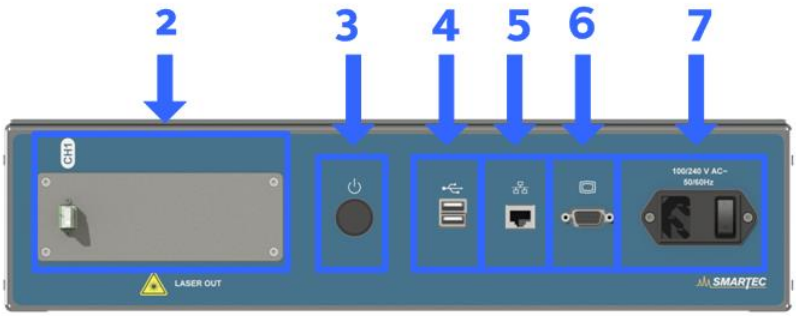
2.2.3 General Precautions

Everyone who uses a laser's equipment should be aware of the risks. The laser radiation is not visible to the human eye but it can seriously damage user's eyesight.
The laser is enabled when the interrogator is turned on.
Users should never put their eyes at the level of the horizontal plane of the optical adapters of the interrogator or uncovered optical connectors.
Adequate eye protection should always be required if there is a significant risk for eye injury.
Do not attempt to open or repair a malfunction interrogator. It must be returned to Smartec for repair and calibration.

3 Operation

3.1 Connectors

Front View



Bottom View

Fig. 3.1

The connectors and buttons on Fig. 3.1 are:

1. Power and Status LEDs
2. Optical Output Connectors
3. ON/Off Button
4. USB Connectors
5. LAN Connector
6. VGA Connector
7. Power Connector

3.1.1 Type of connectors

The Reading unit has 1 or 4 E2000/APC Optical Output Connectors to which can be plugged only E2000/APC connector. The E2000/APC connectors and Mating are identified by the green color, in the Fig. 3.2 are shown an E2000/APC connector and an E2000/APC Mating adapter:

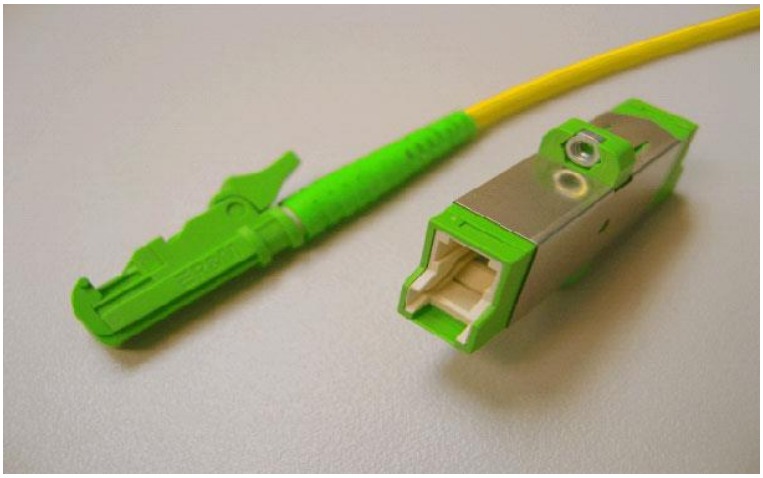


Fig. 3.2

3.2 Setting Up

3.2.1 Power supply

To power supply the MuST VII Dynamic Reading Unit connects the supplied power cable to 100 - 240 V power line to the measurement

unit Power Connector (7 on Fig. 3.1). Then switch the power switch to its “I” position. The measurement unit powering off can be performed by disconnecting the power supply or by switching the power switch to its “O” position.
The measurement unit has internally: one acquisition module and a PC. Whenever the power supply is interrupted (either by a power shortage or a mechanical switch off of the power switch or the power plug) the internal PC will start up and the acquisition module will resume to its configuration at the time of power shortage when device is powered on again.

Information

Check the status and power led (1 on Fig. 3.1) to ensure that the unit is ready to measure.

Fig. 3.3

3.2.2 Optical connectors

The MuST VII Dynamic Measurement Unit can be purchased either with 1 or 4 E2000/APC optical connectors. Number 2 on Fig. 3.1 exemplifies a 1 connector removable base.

Attention should be paid to the cleaning of the optical connectors. A dirty connector can compromise the measurement and will degrade the measurement unit performance. It is advisable to frequently clean the connectors using appropriate tools (see Cleaning Procedure on page 15).

3.2.3 Bottom plate

The bottom plate of the measurement unit is prepared for receiving gland nuts ensuring the closet's water tightness. Two PG21 and 24 PG11 can be used. It is supplied with covers on the holes and without glands.

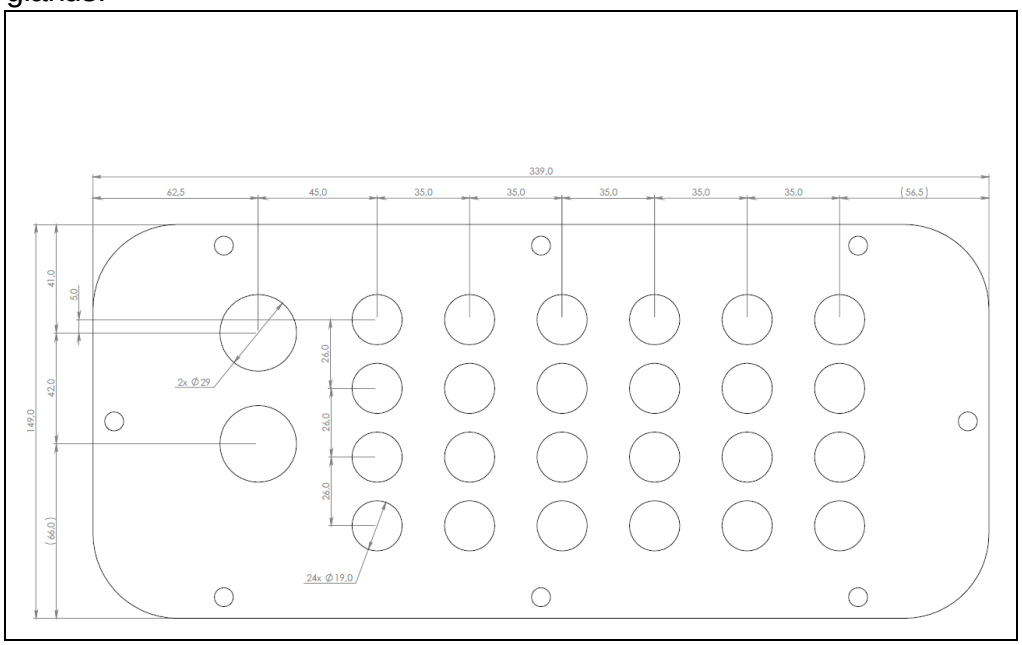


Fig. 3.4

3.3 Switching On

3.3.1 Internal PC

The internal PC will start every time the power is turned from off to on.

3.3.2 Acquisition Module

Pressing the "ON/OFF" button (3 on Fig. 3.1) will start the acquisition module of the unit.

3.4 Switching OFF

3.4.1 Internal PC

The internal PC can be shut down either by software – using the Start Menu in Windows – or when power is turned off.

3.4.2 Acquisition Module

To avoid accidental shutting-down of the acquisition module of the measurement unit, it is necessary to press the "ON/OFF" button (2 on Fig. 3.1) during 4 seconds to power-off the module.

Information

The "ON/OFF" button (2 on Fig. 3.1) will not shut down the PC.

3.5 Power and Status LEDs

Power and status LEDs are related to the acquisition module of the measurement unit.

3.5.1 Power LED

Whenever the acquisition module of the measurement unit is running, the power LED will be on. If the acquisition module of the measurement unit is off, the power LED will be off.

LED	Acquisition module
Green steady	Running
OFF	Not running

3.5.2 Status LED

The Status LED (1 on Fig. 3.1) will start blinking at 2Hz. After approximately 30 seconds it will start blinking at 1Hz. This means that the acquisition module of the measurement unit is already on and responsive, but the optoelectronic module is still warming up. After approximately one and a half minutes (90 s) it should stay on

permanently. This means that the measurement unit is able to measure.

Important

If the acquisition module of the unit does not start correctly, the status led will blink faster. If this happens please contact Smartec technical support.

LED	Acquisition module
Green blinking 2Hz	Powering up
Green blinking 1Hz	Warming up
Green steady	Running
Green blinking 0.5Hz	Running in error mode
OFF	Not running

3.6 Interface

To operate the measurement unit a Monitor and a mouse and keyboard should be connected to the VGA connector (6 on Fig. 3.1) and to the USB ports (4 on Fig. 3.1).

The measurement unit operates on a Windows 7 Professional environment.

Please refer to the software manual for further details.

3.7 Control

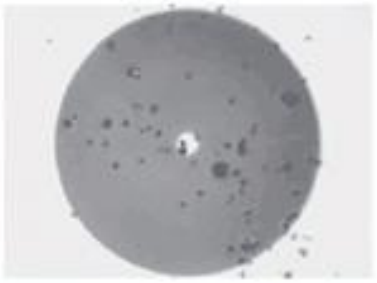
The MuST VII Dynamic Measurement Unit measurement unit can be fully controlled using the DynamicMONITOR software. Please refer to the DynamciMONITOR software manual for further details.

3.8 Cleaning Procedure

Proper performance of a fiber optic connection is strongly dependent on the cleanliness of the mated ferrules. After repeated matings,

however, or when degraded performance is observed, it may become necessary to clean the individual ferrules and mating sleeve. In this section are outlined the proper cleaning and inspection procedures to help ensure optimal connector performance.
When a Measurement Unit is repeatedly being plugged in and out with optical connectors, it is very important that the connectors are cleaned prior to any connection. If not, dust and moister can be deposited in the measurement unit adaptor and this will compromise measurements. On Fig. 3.5 a picture of a magnified connector is presented. The dark gray circle corresponds to the fiber cladding and the small light gray circle is the core of the fiber. One picture for a clean connector and one picture for a dusty connector are presented.

Clean connector



Dirty connector

Fig. 3.5

The most common effect of dirt on the connections is that there is a large amount of broad band light that is being reflected at the connection, at both directions, meaning that the dynamic range for measuring becomes smaller.

On the market there are several tool aimed to clean the connectors, some of them are:

- Dust and shutter caps
- Isopropyl alcohol
- Cotton swabs
- Soft tissues
- Pipe cleaner
- Compressed air

Information

Before reporting the general procedure for cleaning connectors it is important to highlight some reminders that shall always be kept into account:

- *Always turn off any laser sources before you inspect fiber connectors*
- *Always inspect the connectors or adapters before you clean.*
- *Always inspect and clean the connectors before you make a connection.*
- *Always use the connector housing to plug or unplug a fiber.*
- *Always keep a protective cap on unplugged fiber connectors.*
- *Always store unused protective caps in a sealable container in order to prevent the possibility of the transfer of dust to the fiber. Locate the containers near the connectors for easy access.*

WARNING

Some warnings as well:

- **Never use alcohol or wet cleaning without a way to ensure that it does not leave residue on the end face. It can cause damage to the equipment.**
- **Never look into a fiber while the system lasers are on.**
- **Never use unfiltered handheld magnifiers or focusing optics to inspect fiber connectors.**
- **Never connect a fiber to a fiberscope while the system lasers are on.**
- **Never touch the end face of the fiber connectors.**
- **Never twist or pull forcefully on the fiber cable.**

- **Never touch the clean area of a tissue, swab, or cleaning fabric.**
- **Never touch any portion of a tissue or swab where alcohol was applied.**
- **Never touch the dispensing tip of an alcohol bottle.**
- **Never use alcohol around an open flame or spark; alcohol is very flammable.**

The here below section describes the connector cleaning process.

- Inspect the fiber connector, component, or bulkhead with a fiberscope with a proper E2000 adapter.
- If the connector is dirty, clean it with a dry cleaning technique.
- Inspect the connector.
- If the connector is still dirty, repeat the dry cleaning technique.
- Inspect the connector.
- If the connector is still dirty, clean it with a wet cleaning technique followed immediately with a dry clean in order to ensure no residue is left on the end-face.

Important

Wet cleaning is not recommended for bulkheads and receptacles. Damage to equipment can occur.

- Inspect the connector again.
- If the contaminate still cannot be removed, repeat the cleaning procedure until the endface is clean.

Here below dry and wet cleaning technique are described:

3.8.1 Dry cleaning technique

Necessary tool

Lint-free wipes, preferably clean room quality.

Fig. 3.6

Starting Pre-Caution

Read the reminders and warnings before you begin this process.

- ► Make sure that the lasers are turned off before you begin the inspection.
- ► Remove the protective cap using the E2000 service adapter.
- ► Fold the wipe into a square about 4 to 8 layers thick, see Figure 8.
- ► Inspect the connector with a fiberscope.

If the connector is dirty, clean it with a lint-free wipe.

WARNING

Be careful not to contaminate the cleaning area of the wipe with your hands or on a surface during folding.

- ► Lightly wipe the ferrule tip in the central portion of the wipe with a figure 8 motion.

WARNING

Do not scrub the fiber against the wipe. If you do it, it can cause scratches and more contamination.

- ► Repeat the figure 8 wiping action on another clean section of the wipe.
- ► Properly dispose of the wipe.
- ► Inspect the connector again with the fiberscope.
- ► Repeat this process as necessary.

3.8.2 Wet cleaning technique

Necessary tool

Lint-free wipes, preferably clean room quality, and 99% isopropyl alcohol.

- ► Make sure that the lasers are turned off before you begin the inspection.
- ► Remove the protective cap using the E2000 service adapter.
- ► Inspect the connector with a fiberscope.
- ► Fold the wipe into a square, about 4 to 8 layers thick.
- ► Moisten one section of the wipe with one drop of 99% alcohol. Be sure that a portion of the wipe remains dry.
- ► Lightly wipe the ferrule tip in the alcohol moistened portion of the wipe with a figure 8 motion. Immediately repeat the figure 8 wiping action on the dry section of wipe to remove any residual alcohol.

WARNING

Do not scrub the fiber against the wipe, doing so can cause scratches.

- ► Properly dispose of the wipe.

Important

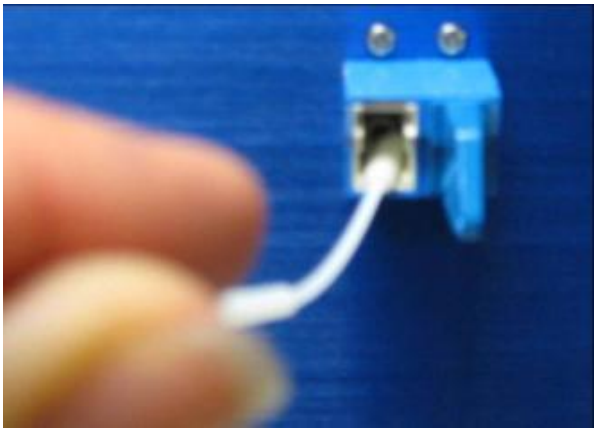
Never reuse a wipe.

- Inspect the connector again with a fiberscope.
- Repeat the process as necessary.

To clean an optical measurement unit adapter, use an appropriate cotton swab (there are several fiber clean swabs in the market frequently used for telecom) embedded in isopropyl alcohol.

- Ensure the reading unit is disconnected and switched off
- put some isopropyl alcohol on cleaning stick
- Push the metallic protection inside the connector with the help of the cleaning stick. You with then see a white plastic ring
- insert the stick inside the ring and gently clean the inner part of the connector rotating the swab always on the same direction.

How to clean an FC connector of a reading unit



How to clean an E2000 connector of a reading unit

Fig. 3.7

3.9 Fuse Replacement

Electrical shorts may cause fuse failure and when that happens it is necessary to replace the fuse located on the Power Connector (Fig. 3.8). To replace the fuses release the top and bottom springs of the fuse's support and then remove the piece (Fig. 3.8).

Realeasing the top and bottom springs

Fuses on the piece

Fig. 3.8

Fuse characteristics:

- Rated voltage: 250 Volt AC
- Interrupting rate: 2 Ampere
- Number of fuses: 2

4 DynamicMONITOR Software

The DynamicMONITOR graphical interface is divided into two different areas (Fig. 4.1):

1. General Bar
2. Graphical Area

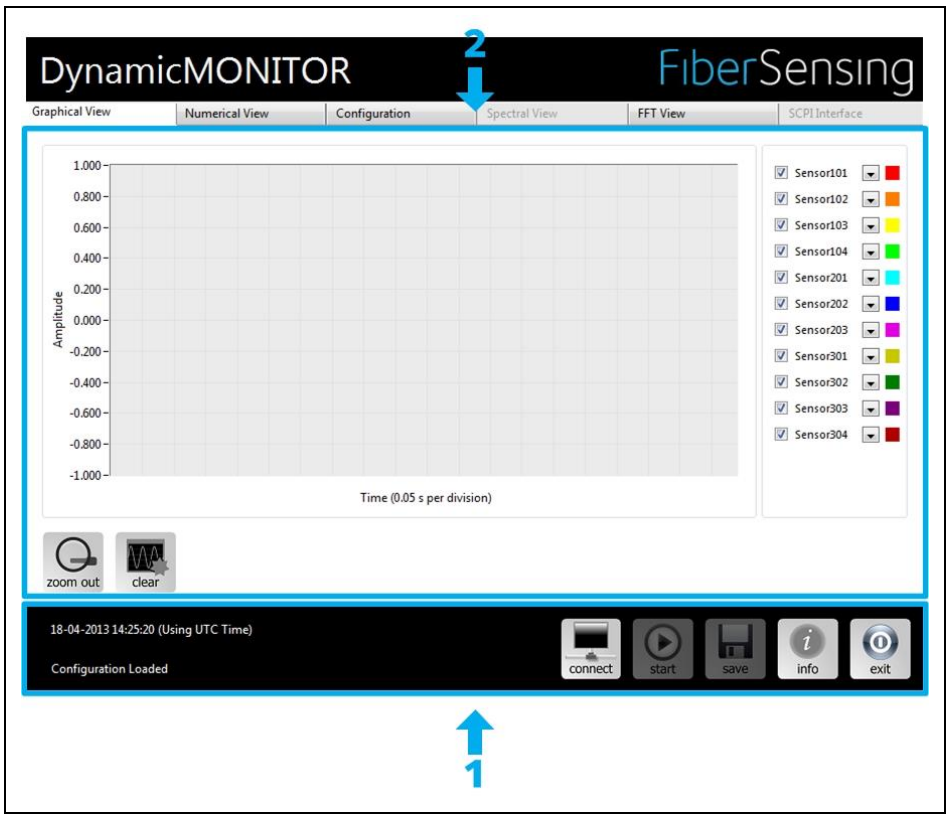


Fig. 4.1

4.1 General Bar

The General Bar, that is always active, is where the main acquisition actions can be performed.
On the left, the current date and time are shown (number 1 on Fig. 4.2).
To establish connection between the measurement unit and the software press the connect button (number 2 on Fig. 4.2). If the software finds the device, the connect button changes to “disconnect” and the start button (number 3 on Fig. 4.2) becomes active as shown on Fig. 4.3.

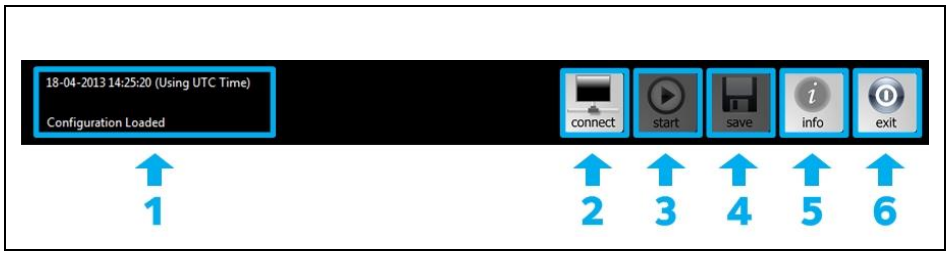


Fig. 4.2

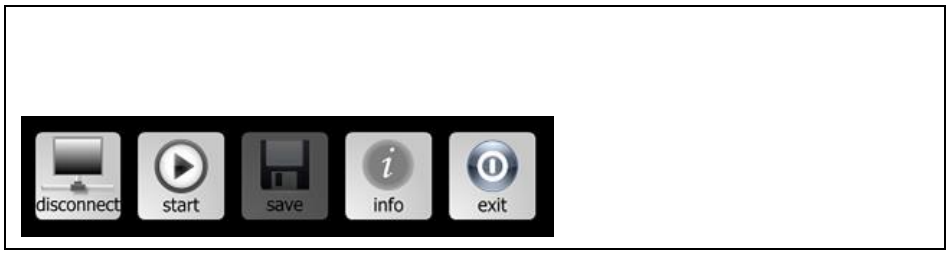


Fig. 4.3

If a measurement unit is not found in the previously used IP Address, a window will pop up (Fig. 4.4) and a new IP Address has to be defined (number 1 on Fig. 4.4), tested (number 2 on Fig. 4.4) and confirmed (number 3 on Fig. 4.4) by the user.

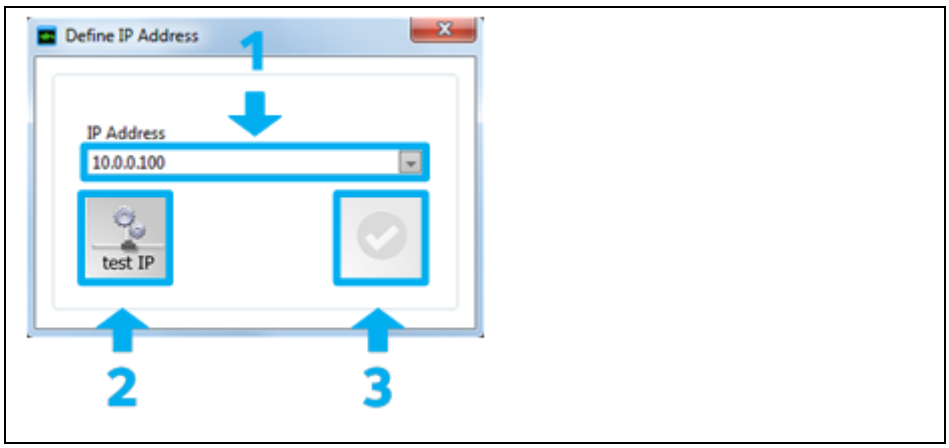


Fig. 4.4

Information

The FS2x00 100S/s series measurement units default IP is 10.0.0.100 which is the IP address used on the first connection with the DynamicMONITOR software.

4.1.1 Acquisition

Start Acquisition

Press the start button to start acquisition. This will start the acquisition and representation of the measured values for all optical channels.

Important

Before start acquisition make sure that the network configuration on «Configuration» tab is up to date. For more details refer to page 32.

Saving Data

To save data, select the file path to define the folder where data is to be stored (see configuration section on page 32).

The naming of the file is automatic and corresponds to the timestamp of the last measurement recorded.

Saved data file collects the data between the instant the save button is pressed and the instant it is pressed back. Data files are divided in accordance to a predefined maximum size. To define the maximum size of the data files see «Configuration» section on page 32.

The first row of data files indicates the acquisition rate and the second row indicates the columns meaning. The data file is organized in columns as follows, see Fig. 4.5.

- 1st column – UTC Date: «DD-MM-YYYY»
- 2nd column – UTC Time: «HH:MM:SS.SSS»
- 3rd column – Sample: Sample number
- Following columns – Sensor Name (Formula): measured values (formula computed) ordered by optical channel, then by wavelength.

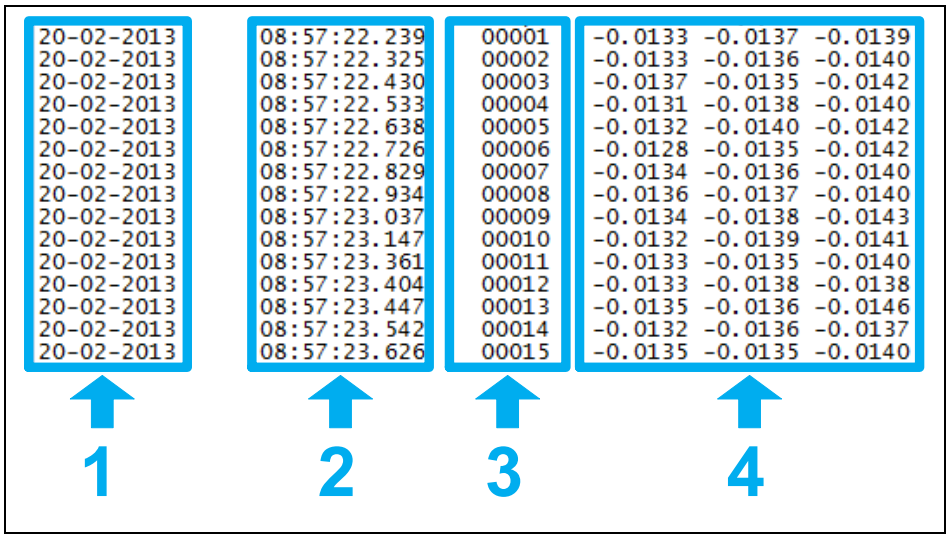


Fig. 4.5

General information on the software version can be called by pressing the info button (number 5 on Fig. 4.2).
Exiting the application should be performed by pressing the exit button (number 6 on Fig. 4.2).

Opening Data in Microsoft Excel

To import the data file to a Microsoft Office Excel Workbook proceed as follows:
Once Microsoft Excel is opened, press button “From Text” from menu Data>Get External Data (see Fig. 4.6) and select the file data file.

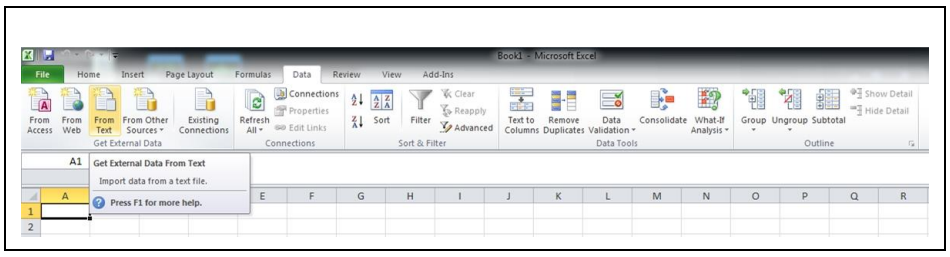


Fig. 4.6

Then it is necessary to complete text import wizard. All options must be set as shown on Fig. 4.7 to Fig. 4.11.

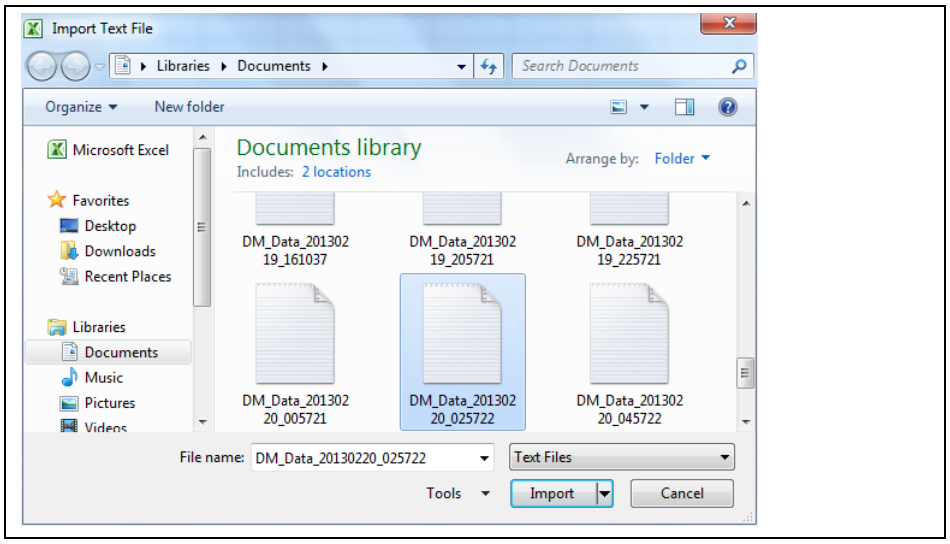

Import Text File
Libraries ▸ Documents ▸
Search Documents
Organize
New folder
Microsoft Excel
Favorites
Desktop
Downloads
Recent Places
Libraries
Documents
Music
Pictures
Videos
Documents library
Includes: 2 locations
Arrange by: Folder
DM_Data_20130219_161037
DM_Data_20130219_205721
DM_Data_20130219_225721
DM_Data_20130220_005721
DM_Data_20130220_025722
DM_Data_20130220_045722
File name: DM_Data_20130220_025722
Text Files
Tools
Import
Cancel

Fig. 4.7

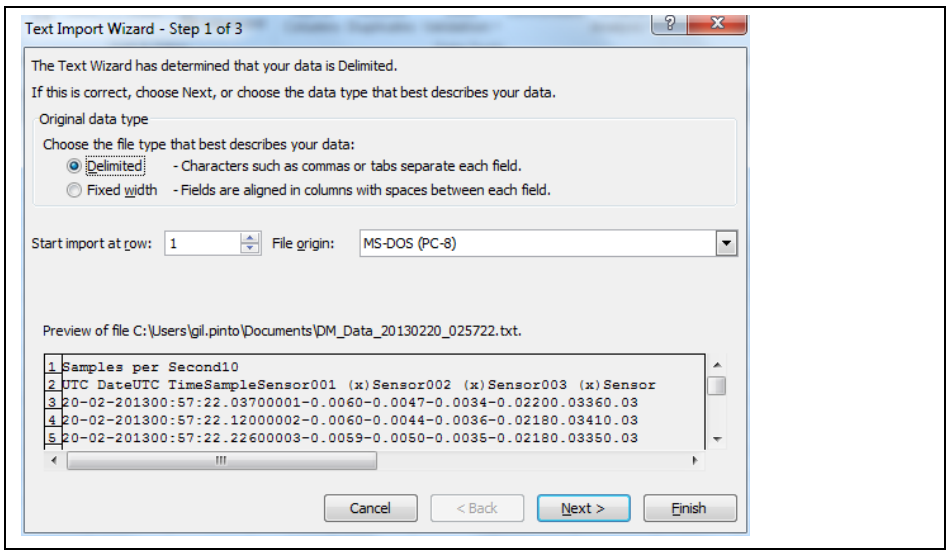

Text Import Wizard - Step 1 of 3
The Text Wizard has determined that your data is Delimited.
If this is correct, choose Next, or choose the data type that best describes your data.
Original data type
Choose the file type that best describes your data:
Delimited - Characters such as commas or tabs separate each field.
Fixed width - Fields are aligned in columns with spaces between each field.
Start import at row: 1
File origin: MS-DOS (PC-8)
Preview of file C:\Users\gil.pinto\Documents\DM_Data_20130220_025722.txt.
1 Samples per Second10
2 UTC DateUTC TimeSampleSensor001 (x)Sensor002 (x)Sensor003 (x)Sensor
3 20-02-201300:57:22.03700001-0.0060-0.0047-0.0034-0.02200.03360.03
4 20-02-201300:57:22.12000002-0.0060-0.0044-0.0036-0.02180.03410.03
5 20-02-201300:57:22.22600003-0.0059-0.0050-0.0035-0.02180.03350.03
Cancel
< Back
Next >
Finish

Fig. 4.8

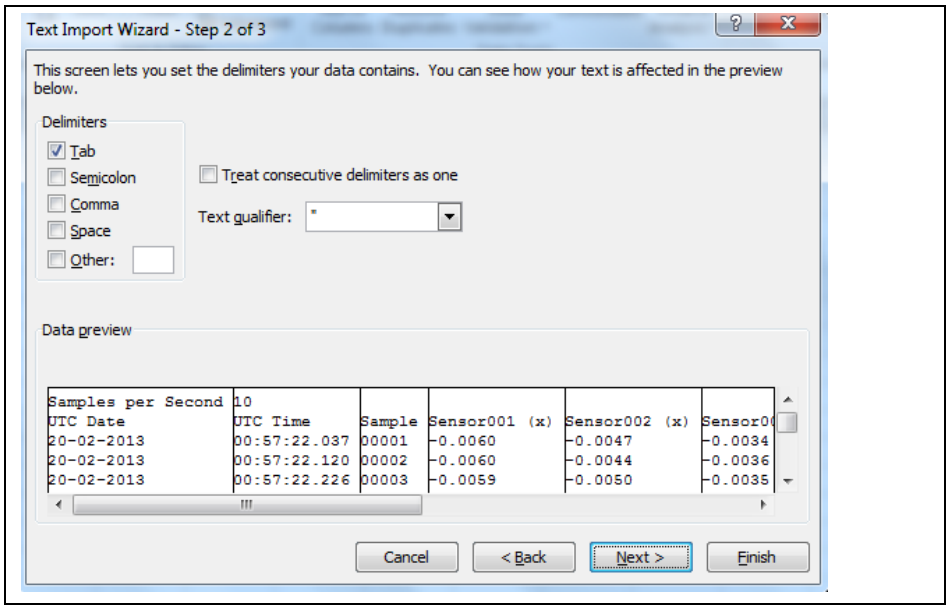


Fig. 4.9

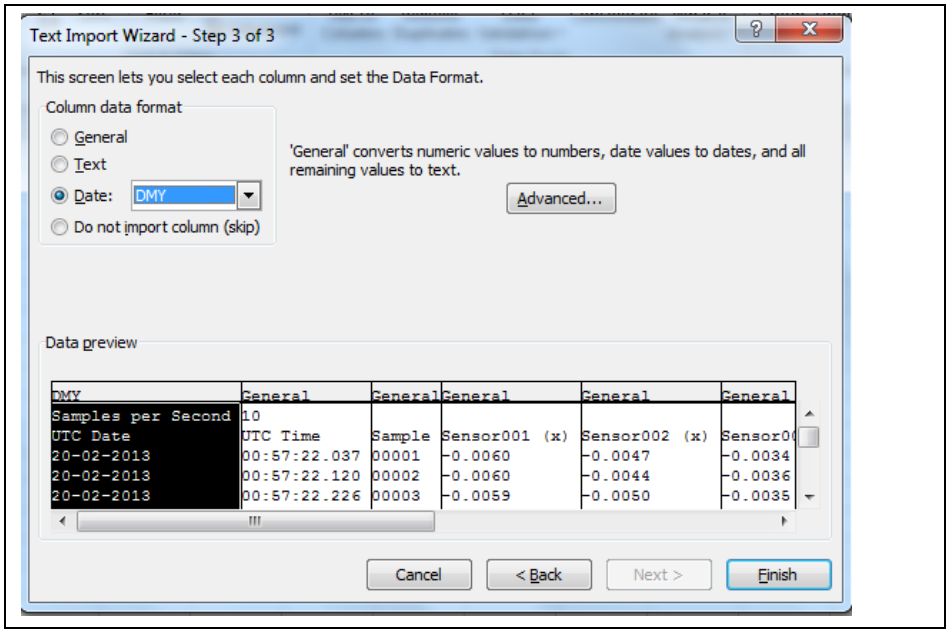


Fig. 4.10

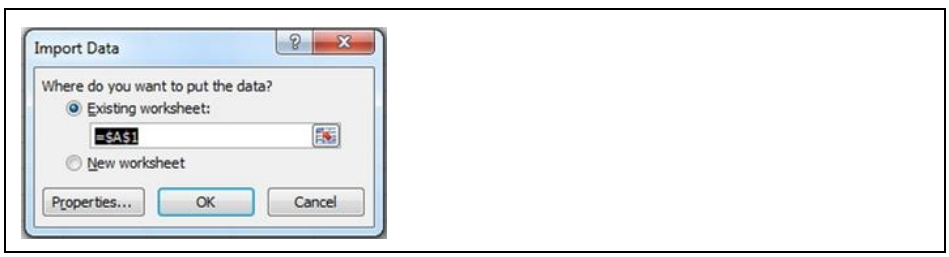


Fig. 4.11

Stop Acquisition

To stop acquisition press the start button again. It will turn from active to the state showed in Fig. 4.3.

4.1.2 Exit Application

To exit DynamicMONITOR application, press the exit button (number 7 on Fig. 4.2).

4.2 Graphical Area

The graphical area is divided into six tabs:

- Graphical View
- Numerical View
- Configuration
- Spectral View
- FFT View
- SCPI Interface

4.2.1 Graphical View

On the Graphical View, graphical representation of the measured values can be found over time (number 1 on Fig. 4.12).

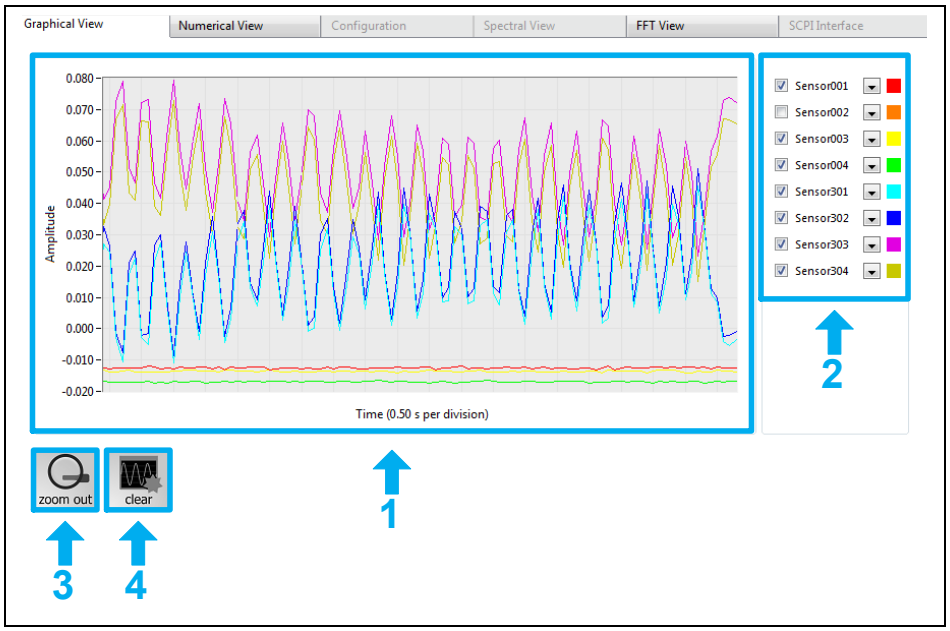


Fig. 4.12

Using the drop-down arrow of the legend, as shown on number 2 on Fig. 4.12, the user can select the sensors to represent and by selecting the tick box enable or disable their representation.

Zoom In and Out

The user can perform zoom in by selecting an area on the displayed graph and zoom out by pressing number 3 on Fig. 4.12. Alternatively, scale numbers can be edited.

Clear Graph

All displayed data can be deleted by pressing clear button (number 4 on Fig. 4.12).

4.2.2 Numeric View

The Numeric View shows the acquired values (in accordance to the configuration formula) for each optical channel, organized in columns as in Fig. 4.13.

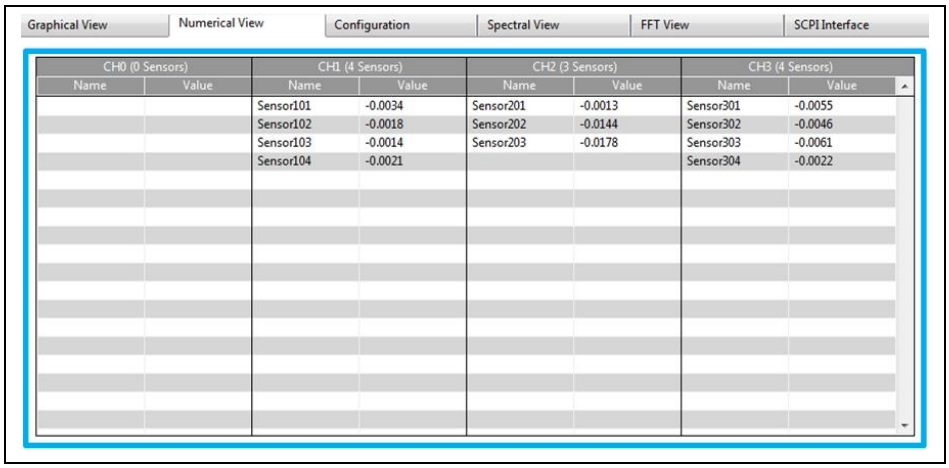


Fig. 4.13

4.2.3 Configuration

Acquisition configuration allows one to perform sensors configuration for the acquisition of engineering values. To accomplish this step correctly, sensors' calibration sheets might be needed.
The DynamicMONITOR allows editing, saving and opening sensor configurations. The configuration corresponds to the identification and the definition of the calibration formula that converts measured wavelengths into engineering values of the sensors.
The easiest way to start measuring and creating a configuration is to perform an auto-scan (refer to section «AutoScan» on page 33).

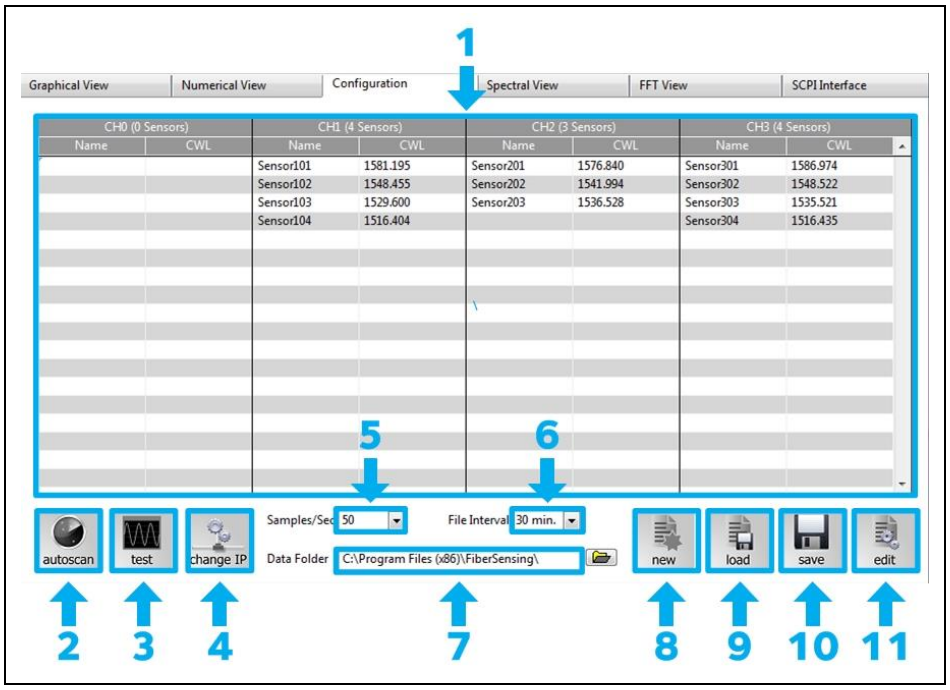


Fig. 4.14

Clear configuration

If an old configuration is set, it is possible to clear it and start a new configuration by pressing button New (number 8 on Fig. 4.14). Be aware this operation will discard all previous unsaved configurations of all channels.

AutoScan

When AutoScan is performed for the first time, the measurement unit executes a measuring sweep and the DynamicMONITOR defines a new configuration with all the found sensors. This configuration sets the current measured WaveLength as Central WaveLength with a default Range of 3 nm.

WARNING

Confirm that gain and threshold values are correctly defined so that no sensor is left out and that no noise is configured as a sensor (see section «Measurement Configuration» on page 40).

Sensor Names are set by default as SensorXZZ, where X is the optical channel and ZZ is the number of the sensor on that optical channel ordered by wavelength.
Example:
Sensor315 corresponds to the 15th sensor of optical channel 3.

Add and Edit Configuration

In order to Add new sensors to an existing configuration, the user has to repeat the AutoScan and choose the tick box "update only the new or deleted sensors on the network" as shown on Fig. 4.15. If this option is not selected all sensors configurations (including formulas) will be lost and new AutoScan configurations are created.

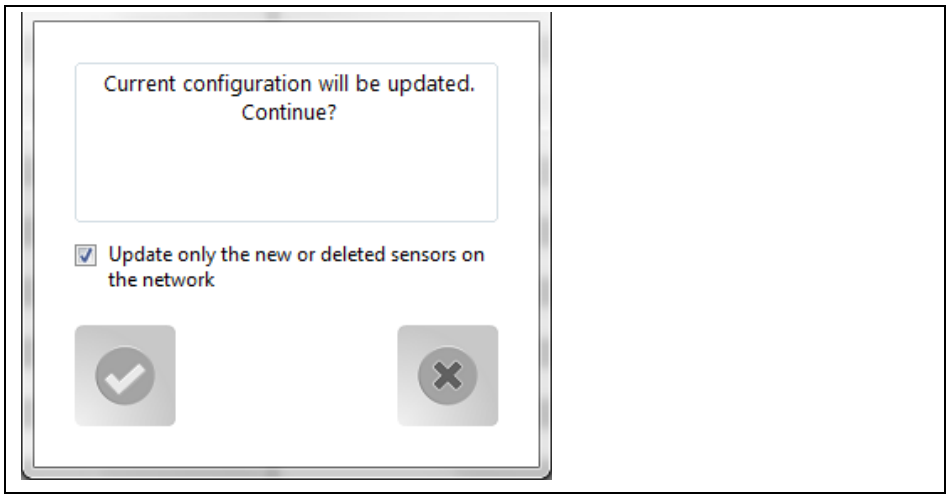


Fig. 4.15

To configure a sensor individually select its cell and click on edit button (number 11 on Fig. 4.14), hence a dialog box will pop up (Fig. 4.16). Additional info about this dialogue box might be found at the next table.

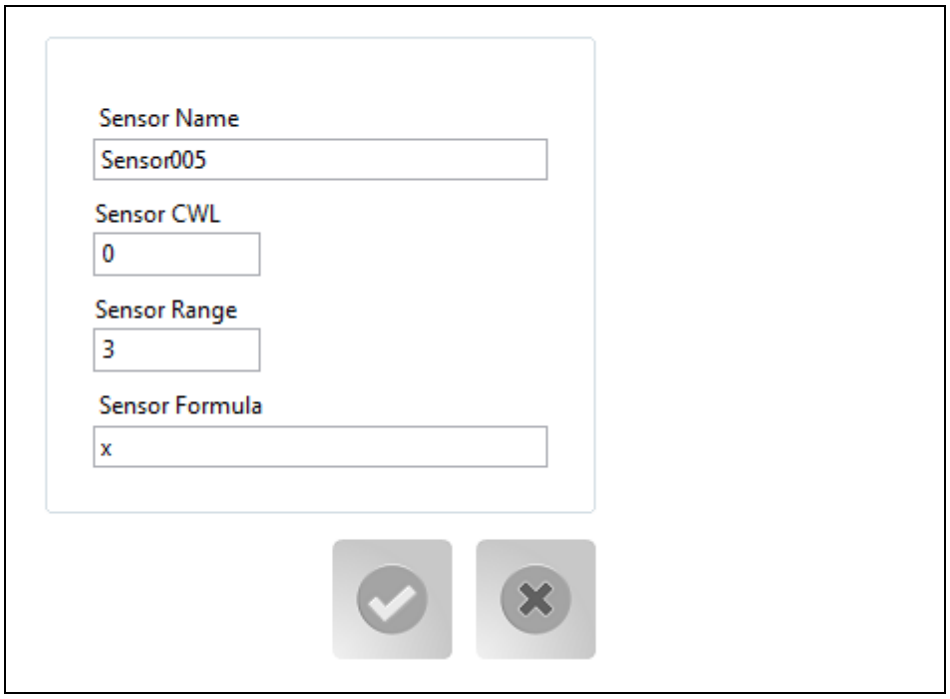


Fig. 4.16

Sensor Name	Sensor's identification field. It is not possible to have two sensors with the same name.
Central Wavelength (CWL)	Reference wavelength from which WaveLengthShift is calculated.
Range	Safety bands defined to avoid crosstalk between sensors. Each sensor has its own operation range. For instance, if we have a CWL of 1522.659nm and a range spanning 3nm, only WaveLength values between 1525.659 and 1519.659 are accepted. WaveLength values out of the defined bands are returned as -998. Inside each band only the highest peak is considered.
Formula	Function defining the correlation between the WaveLengthShift (x) and the engineering values. x corresponds to the difference between the measured WaveLength at each instant and the defined CentralWaveLength: $x = WL - CWL$ Here it is possible to set a formula manually, although it is also possible to copy and paste from other locations. If the desired output is WaveLengthShift, insert x on formula textbox.

Do	**Do not**
-11.3	-11,3
-11.3*x	-11.3x
-11.3*x^2+105.4*x+30	=-11.3*x^2+105.4*x+30

Test configuration

Test Configuration (number 3 on Fig. 4.14) allows the user to check the current values from each sensor according to its configuration.

Information

Error code will be displayed as -998 when no sensor is found within the defined range.

Save and Load configuration

Acquisition configuration can be saved in .txt extension file by pressing the Save button (number 10 on Fig. 4.14) and choosing a save path as shown on Fig. 4.17.

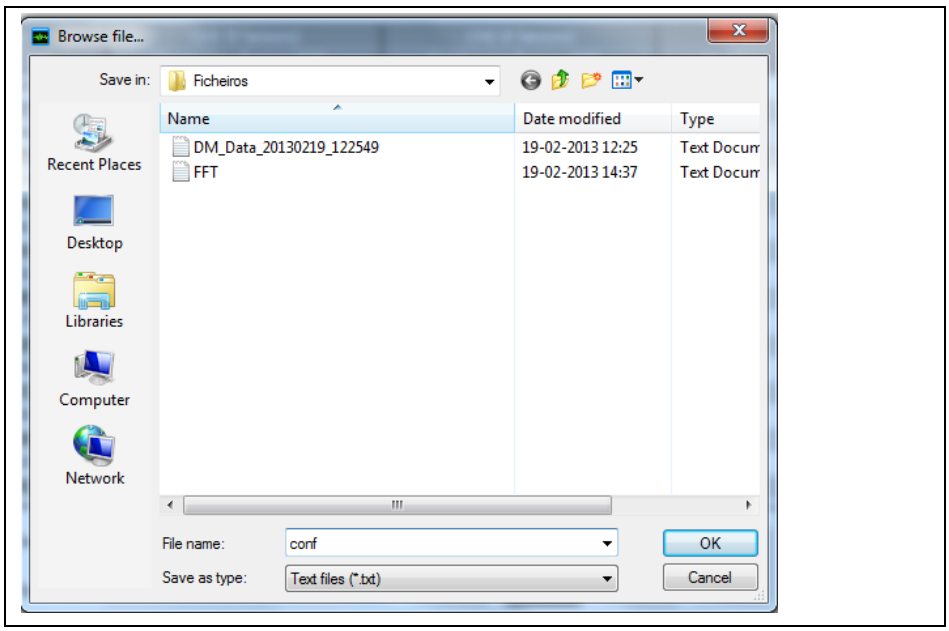


Fig. 4.17

In the configuration file the information is divided by optical channel identified between brackets (number 1 on Fig. 4.18). For each sensor there are 4 columns, namely: Sensor's Name, Central WaveLength (nm), Range (nm) and Formula separated by semicolons (as in numbers 2, 3, 4 and 5 on Fig. 4.18).

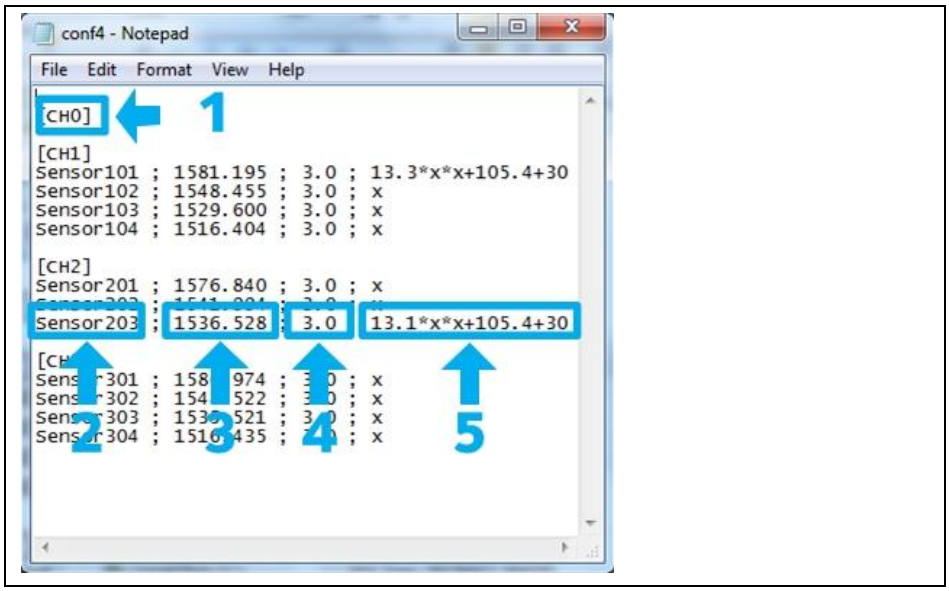


Fig. 4.18

This file might be edited in Notepad or Excel (see "Opening Data in Microsoft Excel" section on page 27) and saved as .txt extension file after editing.
Configuration file can always be loaded by the user by pressing the Load button (number 7 on Fig. 4.14) and pick the configuration file (see Fig. 4.19).

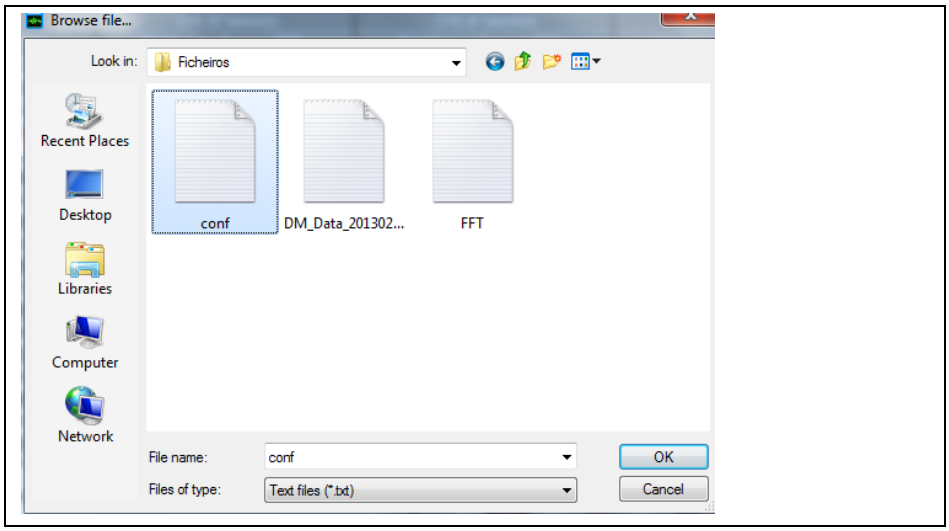


Fig. 4.19

Changing Sample Rate

The sample rate can be altered using the dropdown box in number 5 from Fig. 4.14. Available rates are 1, 2, 5, 10, 20, 50 and 100 samples per second.

Important

This sampling rate corresponds to averaged values of data acquired at 100S/s.

File Options

Measured data is recorded in the directory defined on the box number 7 on Fig. 4.14. To choose this directory the user can write on the box or press the folder button next to the box, drive to the right directory and then press “current folder” button.

Each saved file has a limited length defined by time. The maximum time interval for each data file can be defined on number on Fig. 4.14. When this interval is over, the data file created and named with the timestamp of the last measurement recorded. The recording rate of the saved data can be set on number 4 on Fig. 4.14.

Change IP Address

To change the IP Address of the measurement unit press the change IP Address button (number 4 on Fig. 4.14) to pop-up the change IP Address interface (see Fig. 4.20).

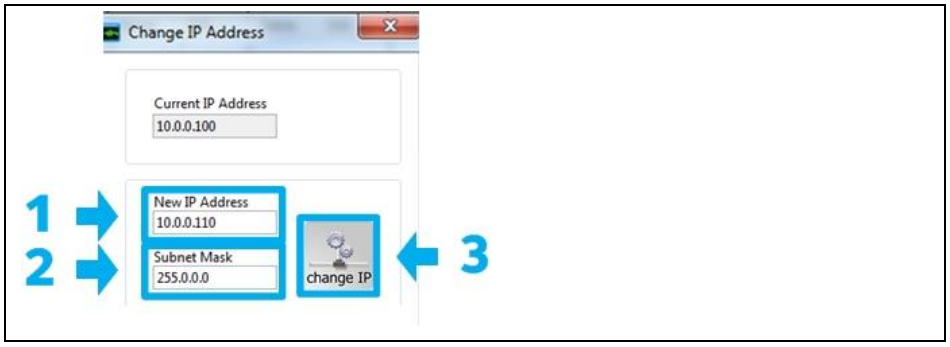


Fig. 4.20

Define the new IP Address (number 1 on Fig. 4.20). The Subnet Mask (number 2 on Fig. 4.20) will be automatically defined according to the IP Address. The Gateway is 0.0.0.0 by default. Then press the Change IP button (number 1 on Fig. 4.20). After a few seconds a validation message will appear (see Fig. 4.21).
When the IP is changed, a connection message appears as shown in Fig. 4.21. At this point, the connection between the computer and the equipment will be lost and the unit will reboot with the new IP Address. This operation might take a few minutes.
The next time the Connect button (number 2 on Fig. 4.2) is pressed, DynamicMONITOR will connect to the new IP.

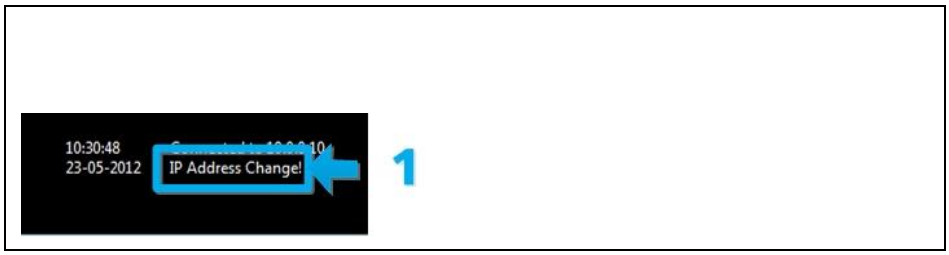


Fig. 4.21

4.2.4 Spectral View

The spectral view tab is only accessible when data acquisition is stopped.
This tab represents detected peaks with the defined gain and threshold settings. Peaks are represented as pairs of wavelength and power amplitude as a bar graph (number 1 on Fig. 4.22).

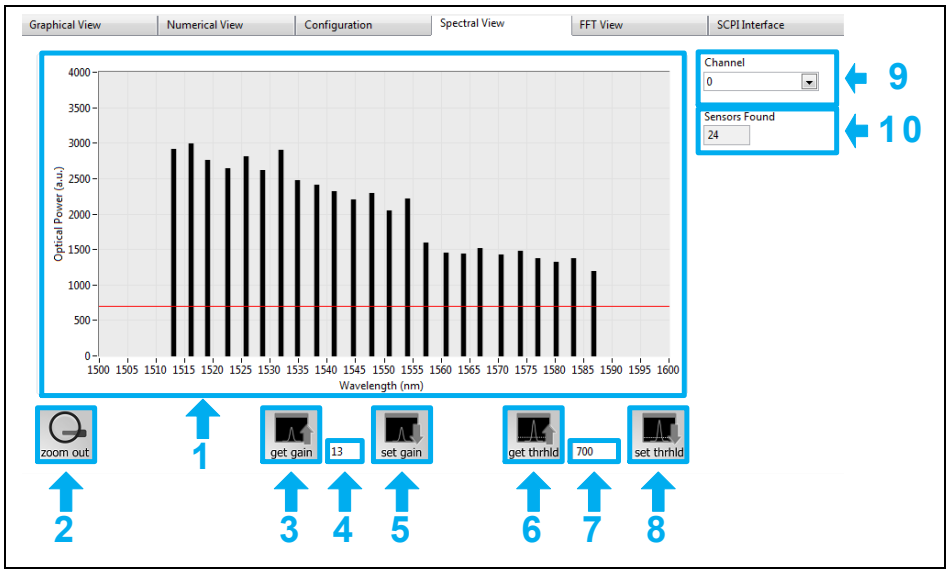


Fig. 4.22

The spectral view can only represent one channel at a time. Channel selection can be performed on number 9 on Fig. 4.22.

Measurement Configuration

Measurement settings can influence sensor readings. Gain and Threshold values should be defined accordingly to the FBG sensing network status, so that peak amplitude is around 3000 and no FBG side lobes are detected as peaks. These settings can be configured independently for each optical channel.

Gain

Gain is directly related to the optical power used on the measurement of the optical channel. The gain value should be raised to overcome losses on the network. Gain is an integer value between 0 and 255. The current gain value can be found using the get gain button (number 3 on Fig. 4.22). The gain value is updated every time the spectral view tab is selected or a new channel is defined. To define a new gain value, write it on the gain box (number 4 on Fig. 4.22) and press set gain button (number 5 on Fig. 4.22).

Threshold

Threshold defines the line between usable signals and noise. It is an integer value between 200 and 3200. Operations for getting and defining threshold values can be performed on a similar way to the gain, but using the threshold buttons (number 6, 7 and 8 on Fig. 4.22).

The threshold value is updated every time the spectral view tab or a new channel are selected. This value is also represented graphically as a horizontal line on the power bar graph.

4.2.5 FFT View

FFT View tab shows the fast Fourier transform graph of the acquired measurements. This computation is based on LabView function Spectral Measurements (FFT.VI), considering the measured values exponential weighted (with no averaging), being the latest signals more significant for the calculations.
Once the start button (number 3 on Fig. 4.2) is pressed all previous measurements are erased from the FFT temporary memory.
FFT is shown for the active sensors on the sensors list, number 4 on on Fig. 4.22 to enable/disable any sensor tick the sensor tick box.

Information

To choose sensors that are not present in the sensors list the user has to edit the list on the Graphical View tab. For more details refer to section «Graphical View» on page 30.

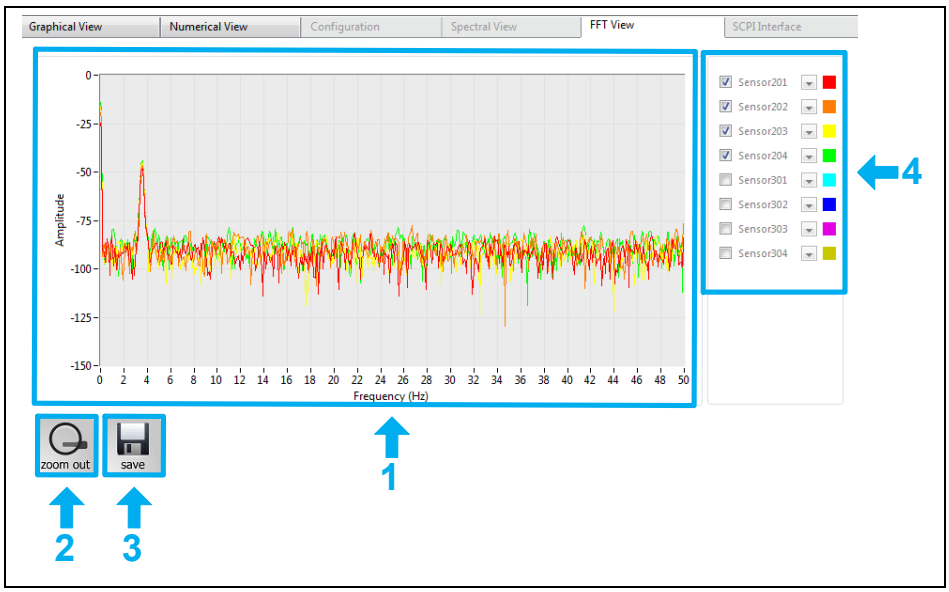


Fig. 4.23

4.2.6 SCPI Interface

This tab allows the user to send Standard Commands for Programmable Instruments (SCPI) to the equipment. Please refer to FS2x00 unit "User's Manual" for a list of the commands available to communicate with the measurement unit.
Commands are inserted on the command line (number 3 on Fig. 4.24) and sent by pressing Enter or Send cmd button (number 2 on Fig. 4.24). The unit's answers appear on the command board (number 1 on Fig. 4.24). Each time new answers are displayed, older ones are pushed down.

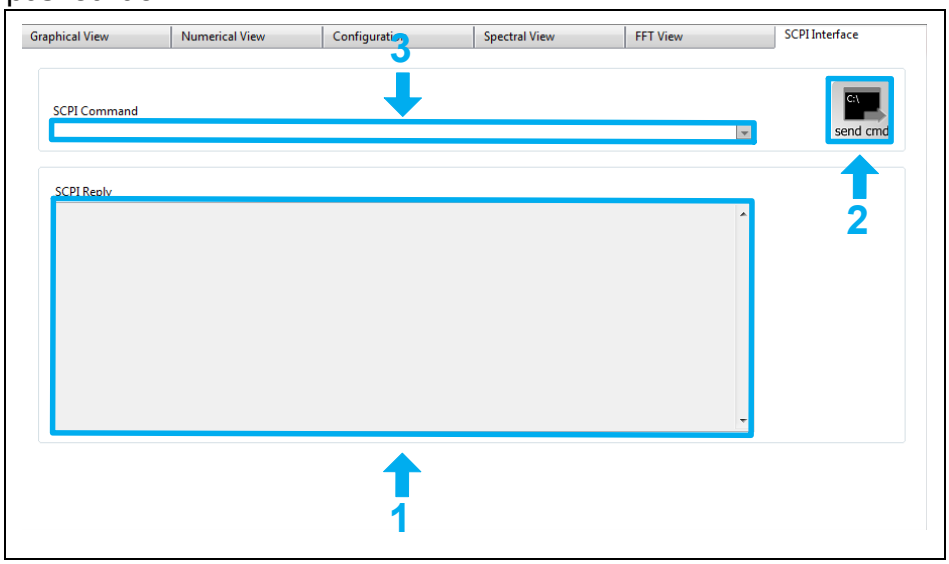


Fig. 4.24

Each time a new command is sent, a shortcut at the scroll down box is created, as shown at Fig. 4.25.

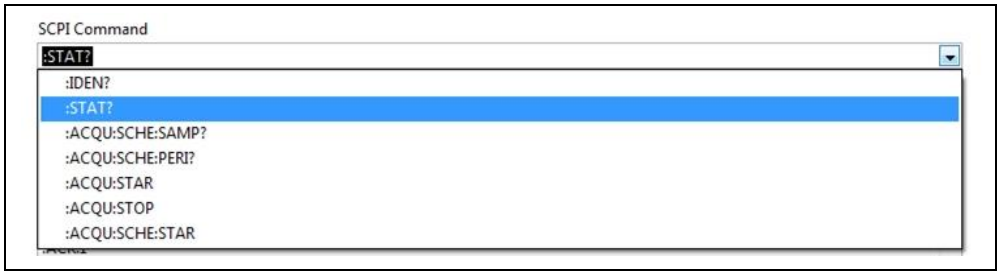


Fig. 4.25

WARNING

When the user leaves SCPI Interface tab, unit status is changed and Schedule acquisitions are disabled.

www.hbm.com/fs

MuST VII Dynamic Manual v2.0

Any questions or comments regarding this guide please report to:
support@smartec.ch

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