

ENGLISH

## Quick Start Guide



# FS22DI

## Industrial BraggMETER DI

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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 INTRODUCTION

This document is a quick start guide for operating the FS22 - Industrial BraggMETER DI interrogator from HKB FiberSensing.



For more details please refer to the full user manual provided with the equipment. This document is also available for download on our website.

This document applies to the following equipment:

## FS22 - Industrial BraggMETER DI

Interrogator Characteristics			Material Number		
Acq. Rate	Enclosure	Connectors		Configurable Item	Standard Item
Dynamic (up to 1000S/s)	Standard	1	FC/APC	K-FS22-01-500-120	-
			SC/APC	K-FS22-03-500-120	-
		4	FC/APC	K-FS22-01-500-420	1-FS22DI-ST/4CH
			SC/APC	K-FS22-03-500-420	-
		8	FC/APC	K-FS22-01-500-820	1-FS22DI-ST/8CH
			SC/APC	K-FS22-03-500-820	-
	Rack-Mountable	1	FC/APC	K-FS22-11-500-120	-
			SC/APC	K-FS22-13-500-120	-
		4	FC/APC	K-FS22-11-500-420	-
			SC/APC	K-FS22-13-500-420	-
		8	FC/APC	K-FS22-11-500-820	-
			SC/APC	K-FS22-13-500-820	-

The FS22 - Industrial BraggMETER DI set includes:

Standard format	Rack-mountable format
	
<ul style="list-style-type: none"><li>- Interrogator</li><li>- AC-DC power supply unit 24V</li><li>- Ethernet cable (L~2m)</li><li>- Mounting blocks with M6 screws</li><li>- Connector protection caps</li><li>- Mounting hole protection caps</li><li>- Quick start guide</li><li>- Digital support material</li><li>- Calibration certificate</li></ul>	<ul style="list-style-type: none"><li>- Interrogator</li><li>- Power cord (Type F plug)</li><li>- Ethernet cable (L~2m)</li><li>- Connector protection caps</li><li>- Quick start guide</li><li>- Digital support material</li><li>- Calibration certificate</li></ul>

## 2 INTERROGATOR SETUP

### 2.1 Buttons and Connectors

#### 2.1.1 Standard Format

The FS22 - Industrial BraggMETER DI on its Standard format has the following buttons and connectors:

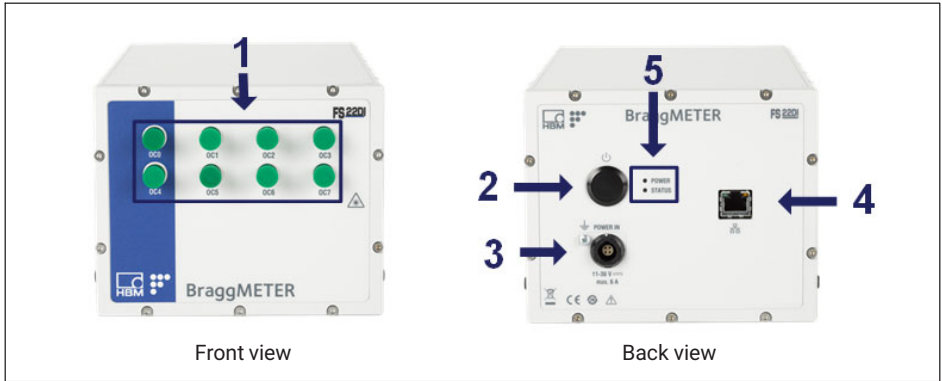


Fig. 2.1

The connectors and buttons in Fig. 2.1 are:

- 1 Optical Output Connectors
- 2 ON/OFF Button
- 3 Power Connector
- 4 Ethernet Connector
- 5 POWER and STATUS LEDs

#### 2.1.2 Rack Mountable Format

The FS22 - Industrial BraggMETER DI on its Rack-Mountable format has the following buttons and connectors:

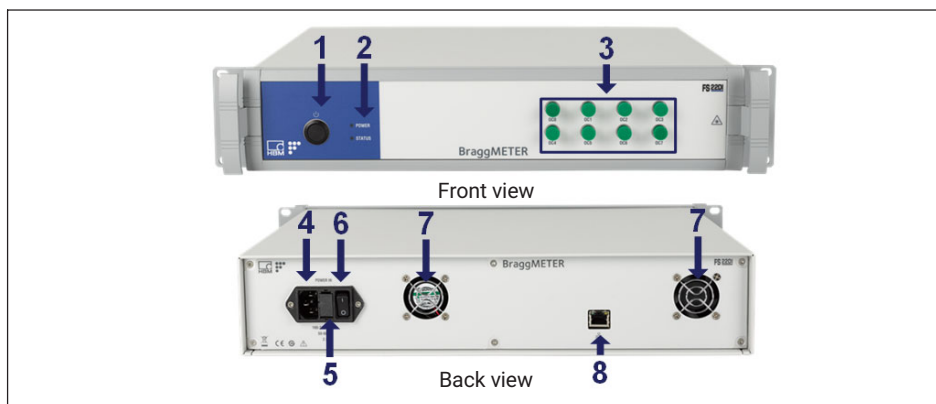


Fig. 2.2

The connectors and buttons in Fig. 2.2 are:

- 1 ON/OFF Button
- 2 POWER and STATUS LEDs
- 3 Optical Output Connectors
- 4 Power Connector
- 5 Electric fuse
- 6 Safety Power Button
- 7 Fans
- 8 Ethernet Connector

## 2.2 Turn On

### 2.2.1 Power

For the Standard interrogator connect the provided power adapter to a 100-240 V power line and the adapter to the interrogator's power connector. Alternatively, connect the interrogator directly to an 11-36 VDC power supply.

For the Rack-Mountable format connect the provided power cable to a 100-240 V power line and to the interrogator's power connector. Then, switch the safety power button ON.

#### Notice

*Powering above the specified limits will damage the equipment. For the Rack-mountable version there is a fuse protection that can be replaced. Please refer to the full user manual for details.*

The Power LED will acknowledge the power supply by turning green for 2 seconds (Fig. 2.3):

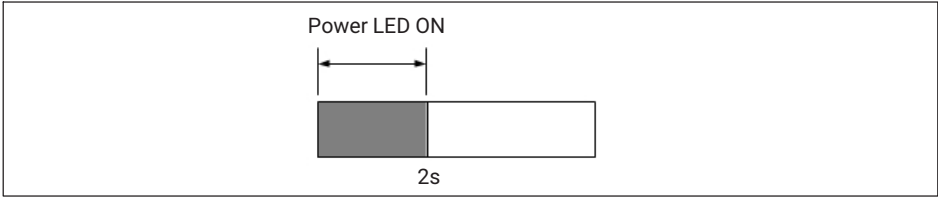


Fig. 2.3

Start the interrogator by pressing the “ON/OFF” button.

The Status LED will start blinking with the following order and meaning:

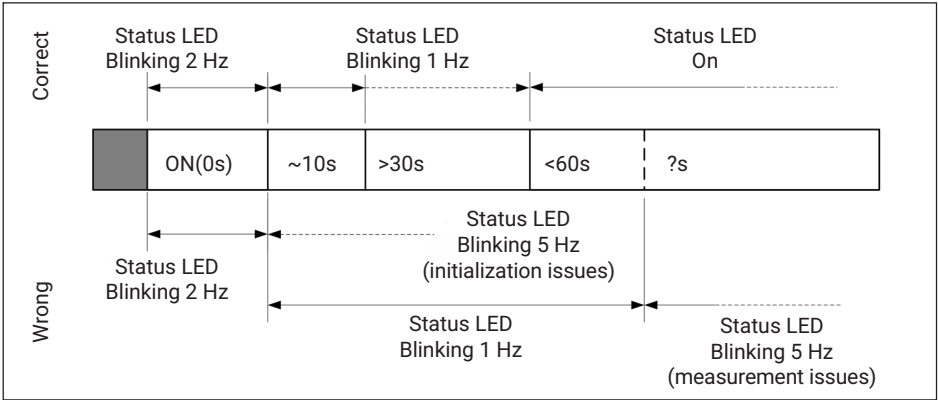


Fig. 2.4

Please note that the durations stated in Fig. 2.4 are merely indicative and may vary depending, for example, on the sampling rate of the interrogator.



**Important**

*In case the interrogator does not start correctly, contact HBK FiberSensing for technical support.*

**2.2.2 Ethernet**

Connect the provided Ethernet cable, or any other cross over cable, from the interrogator to your PC network.

To communicate with the interrogator using a computer both elements should be configured in the same subnet:

- Set the TCP properties of the computer as follows:
  - IP address: 10.0.0.xxx (where xxx should not be 150: the default IP of the FS22DI is 10.0.0.150)
  - Subnet mask: 255.0.0.0
- Test the connection:
  - Launch a command line (e.g. Start → Run → type “cmd”, in Windows environment)
  - Type and execute the following command: “ping 10.0.0.150”
  - On a successful connection the response should be similar to: “Reply from 10.0.0.150: bytes=32 time<1ms TTL=60”.



### Important

*The interrogator can be synchronized to other devices using NTP. For further details refer to the full user manual of the interrogator.*

## 2.2.3 Optical

The FS22 - Industrial BraggMETER DI can be purchased either with FC/APC or SC/APC connectors. Select the appropriate connector type and adapter, if needed, to connect the Fiber Bragg Grating (FBG) sensors to the interrogator.

Attention should be paid to the cleaning of the optical connector(s). A dirty connector can compromise measurements.

## 2.3 Turn Off

To turn off the interrogator, the “ON/OFF” button should be pressed between 2 s to 6 s. The power LED will start blinking acknowledging the shutdown.

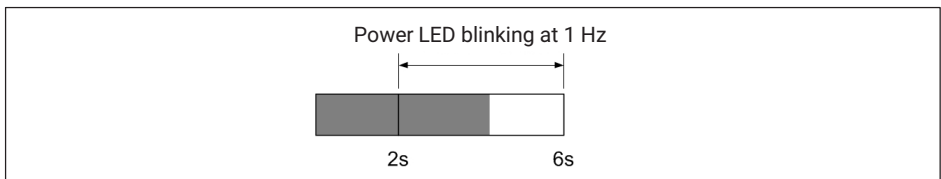


Fig. 2.5



### Important

*Pressing the power button for more than 6 s will reset the interrogators' IP address to its default value. Please refer to the full user manual for further details.*

### 3 REMOTE COMMUNICATIONS

The FS22 - Industrial BraggMETER DI interrogator can be fully controlled using standard SCPI syntax commands.

The interrogator has 5 different operational states that answer to the listed commands below.

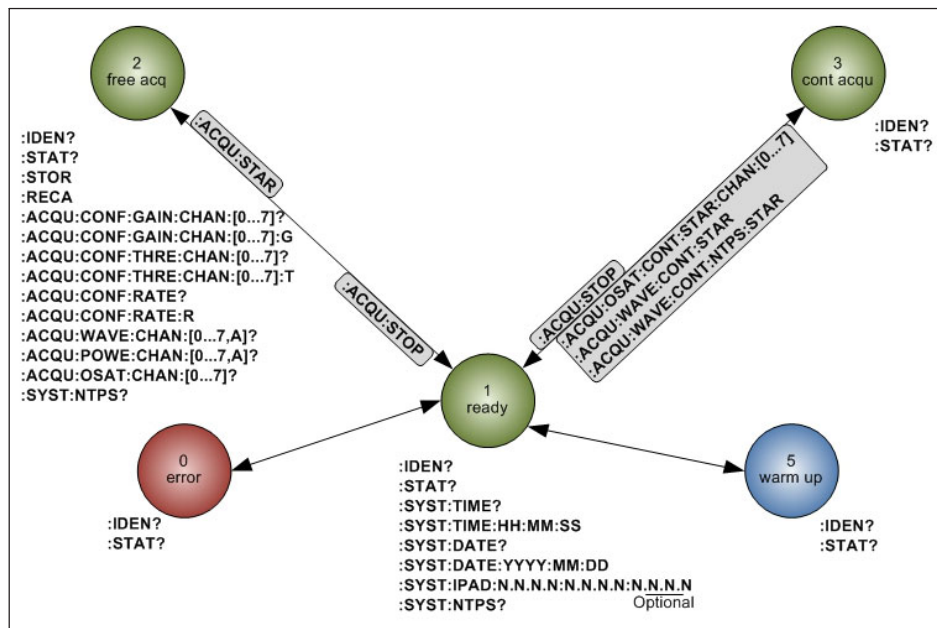


Fig. 3.1

For full information on the commands refer to the interrogator user manual.

## 4 BRAGGMONITOR DI SOFTWARE

### 4.1 Installation

The FS22 - Industrial BraggMETER DI interrogator is provided with the BraggMONITOR DI software.

- ▶ To install the software: Run Setup.exe (as administrator)
- ▶ Follow the described steps and press finish
- ▶ Restart the PC
- ▶ Run BraggMONITOR DI (as administrator)

### 4.2 Graphical User Interface

The following pages describe the main steps for achieving measurements with the BraggMONITOR DI Software. For a full description of the software please refer to the full user manual.

#### 4.2.1 Connect to the Interrogator

To establish a connection to the interrogator press the “connect” button (number 1 in Fig. 4.1) on the general bar available at the bottom of the software window.

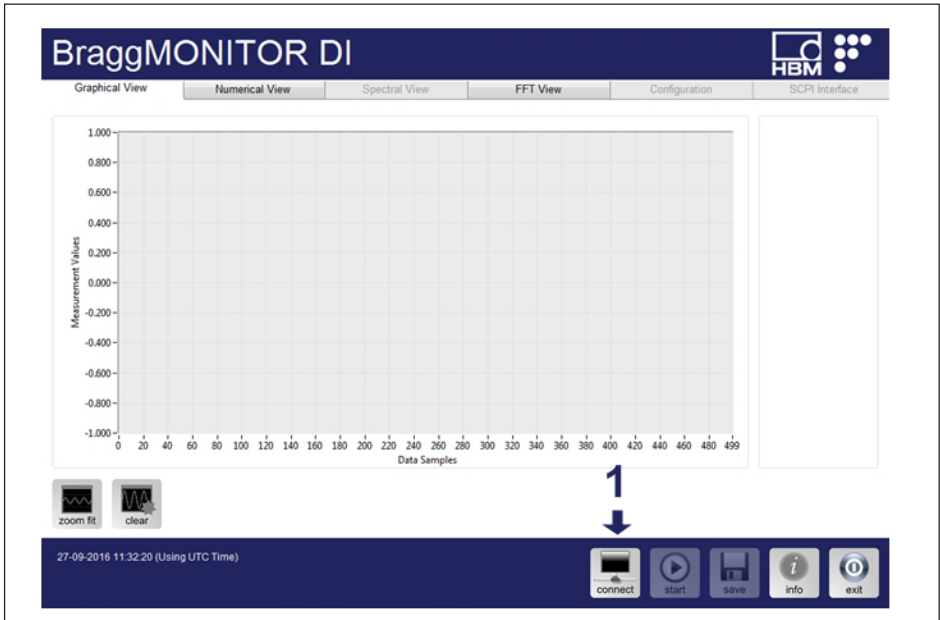


Fig. 4.1

### 4.2.2 Configure Measurements

The reflected spectrum of the connected sensors can be checked under the Spectral View tab. Press the corresponding tab, on top of the graphical user interface, to select it (number 1 in Fig. 4.2).

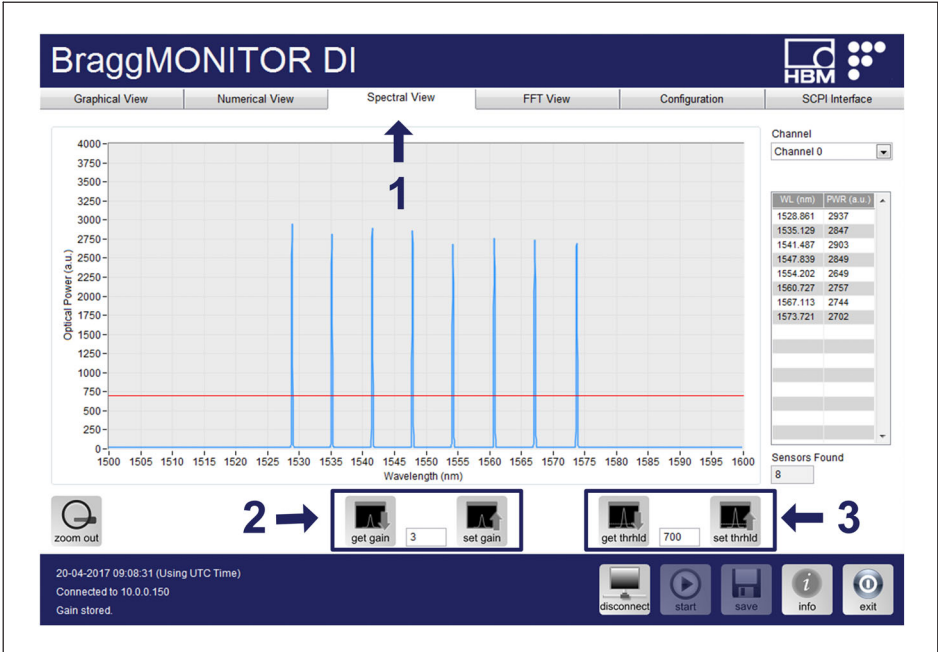


Fig. 4.2

The settings to adjust on the FS22DI Interrogator are the gain (number 2 in Fig. 4.2) and the threshold (number 3 in Fig. 4.2). The “get” buttons query the interrogator for the stored values and the “set” buttons send the new values to the interrogator and store them. The “set” buttons need to be pressed so that the defined value becomes active.

	Meaning	Possible values	Suited value
<b>Gain</b>	Factor for amplifying and optimizing the received signals.	0 to 255	Value that sets the power of the FBGs in the spectrum below saturation and above threshold. Saturation occurs when the peak value is above 4095.
<b>Threshold</b>	Optical power level that separates noise from relevant signal	200 to 3200	Value that leaves all peaks above and does not cross side lobes.

Set the values to the most appropriate ones taking into consideration the existing signals.

#### 4.2.3 Set the Configuration

The configuration of the sensors can be adjusted under the Configuration tab (number 1 in Fig. 4.3).

The screenshot displays the BraggMONITOR DI software interface. The top navigation bar includes tabs for Graphical View, Numerical View, Spectral View, FFT View, Configuration (indicated by arrow 1), and SCPI Interface. The main workspace is a grid showing sensor data for channels CH0 through CH7. CH0 contains 8 sensors with their respective CWL (nm) values. Arrows 2 and 3 point to the CH0 and CH7 columns respectively. The bottom control panel features icons for autoscan, test, change IP, and a data folder path. It also includes a status bar at the bottom showing the current date, time, and connection status.

Fig. 4.3

Press the “autoscan” button (number 2 in Fig. 4.3) to automatically populate the sensor list with the sensors found on the optical network considering the defined settings. The autoscan searches for peaks and defines those found as sensors. For each sensor the autoscan:

- defines an automatic name (CHxSzzz);
- sets the reference wavelength (CWL or  $\lambda_0$ , in nm);
- defines a measurement range of 2.5 nm wide (centered at the peak);
- expresses the measurement formula as x (wavelength variation in nm). The measurement formula has to be a function of x.

Any of these values can be edited manually by selecting the sensors’ cell in the configuration table and pressing the “edit” button (number 3 in Fig. 4.3).

#### 4.2.4 Start Acquisition

Still in the Configuration tab configure:

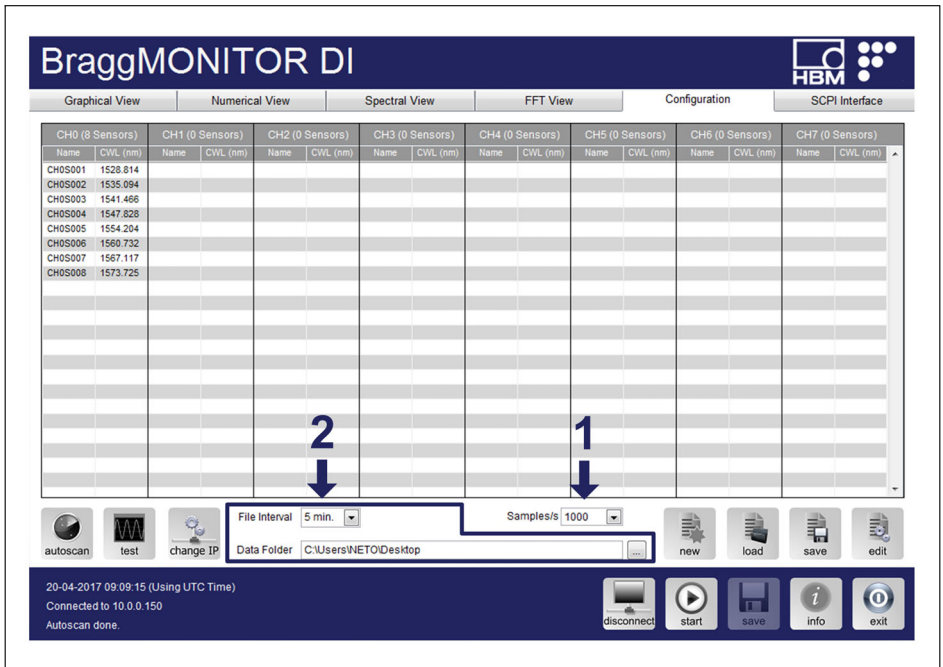


Fig. 4.4

- Measurement acquisition rate (number 1 in Fig. 4.4):
  - Possible values: 50 S/s; 100 S/s; 200 S/s; 500 S/s; 1000 S/s

- Data storage settings (number 2 in Fig. 4.4):
  - When saving, data is stored in separate files named automatically "BraggMONITOR DI Data [YYYY.MM.DD.hh.mm.ss ; YYYY.MM.DD.hh.mm.ss].txt"
  - File interval -> defines the length of the file in terms of acquisition time.
  - Data folder -> sets the folder to which data is stored.

To start acquisition, change to the Graphical View tab (number 1 in Fig. 4.5) and press the "start" button (number 2 in Fig. 4.5).

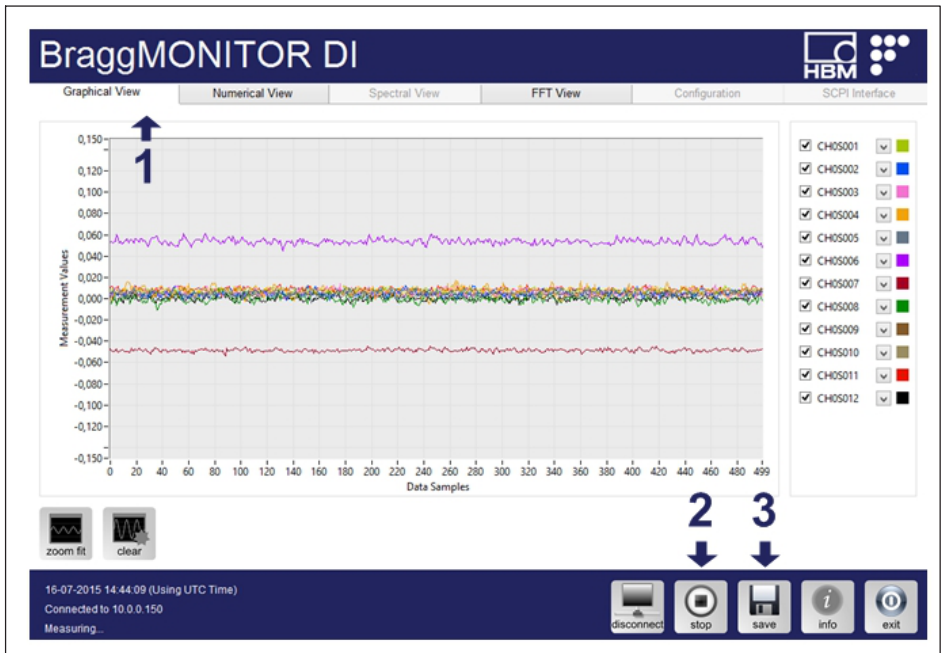


Fig. 4.5

Data will be plotted in the graph, which is updated every second. The sensors to plot can be selected on the channels' checkboxes.

To start saving data to a data file press the "save" button (number 3 in Fig. 4.5).



### Important

*For further information please refer to the user manual provided with the equipment. This document is also available on our website.*

