SOFO Lite Reading Unit

SOFO Lite User Manual
User Manual version: v0.1

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

## SOFO Lite Reading Unit

March 2017
Overview

The SOFO Lite Unit is an optoelectronic device for SOFO sensors readings and measurements. The output of the measurement process consists on the spectral response of each sensor in terms of optical frequency. This optical frequency is computed from the unbalance of the SOFO sensor. The main specifications of the SOFO Lite Unit are listed in the following table.

<table>
<thead>
<tr>
<th>Specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scanning Range</strong></td>
<td>30 nm</td>
</tr>
<tr>
<td><strong>Sample spacing</strong></td>
<td>~3 pm (~0.4 GHz)</td>
</tr>
<tr>
<td><strong>Sample Rate</strong></td>
<td>1 S/s (simultaneous in all channels)</td>
</tr>
<tr>
<td><strong>Optical Channels</strong></td>
<td>10 or 12</td>
</tr>
<tr>
<td><strong>Sensors</strong></td>
<td>1 SOFO sensor per channel</td>
</tr>
<tr>
<td><strong>Connectors</strong></td>
<td></td>
</tr>
<tr>
<td>- Optical</td>
<td>E2000/PC</td>
</tr>
<tr>
<td>- Electrical</td>
<td>Power connector (MSTBV 2.5/3-GF-5.08 Phoenix Contact)</td>
</tr>
<tr>
<td>- Communication</td>
<td>Shielded RJ45 Ethernet</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td></td>
</tr>
<tr>
<td>- Interface</td>
<td>Ethernet (TCP/IP)</td>
</tr>
<tr>
<td>- Commands</td>
<td>SCPI* (ASCII textual strings)</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
</tr>
<tr>
<td>- Operation temperature</td>
<td>[-10;50] ºC</td>
</tr>
<tr>
<td>- Operation humidity</td>
<td>&lt;90% at 40ºC</td>
</tr>
<tr>
<td>- Storage temperature</td>
<td>[-20;70] ºC</td>
</tr>
<tr>
<td>- Storage humidity</td>
<td>&lt; 95% (non-condensing)</td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
</tr>
<tr>
<td>- Dimensions</td>
<td>260 mm x 160 mm x 110 mm</td>
</tr>
<tr>
<td>- Weight</td>
<td>2 kg</td>
</tr>
<tr>
<td>- Enclosure</td>
<td>Aluminium</td>
</tr>
<tr>
<td>- Mounting</td>
<td>DIN Rail on the back</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td></td>
</tr>
<tr>
<td>- Voltage</td>
<td>+24 V DC (±4 V)</td>
</tr>
<tr>
<td>- Consumption</td>
<td>&lt;10 W</td>
</tr>
</tbody>
</table>

* Standard Commands for Programmable Instruments
Operation

The SOFO Lite Unit starts up as soon as the power connector is plugged in, and shuts down if the power connector is unplugged. If the reset button is pressed the system will upload the default settings – e.g., default IP address (10.0.0.10 / 255.0.0.0).

After plugging in the power connector, the system will start up and initiate the warm up sequence. During the warm up process the POWER LED is solid green and the STATUS LED is blinking at 1 Hz. After successfully warming up the system automatically starts measuring all the valid sensors and streams measurement data over TCP/IP. Failure in completing the warming up sequence will lead to blinking of STATUS LED at 5 Hz. Typically, the warm up time is less than 60 s.

For each channel there is a LED that provides information on the quality of the sensor signal. If the quality of the signal from the sensor is satisfactory, the LED will be green. Otherwise, it will be red.

Precautions

There may be the possibility of having measuring malfunctions due to problems in the optical connections. In order to avoid the most common problems, please, follow the following recommendations.

When an interrogator is repeatedly being plugged in and out with optical connectors, it is very important that the connectors are cleaned prior to any connection. Otherwise, dust and moisture can be deposited in the interrogator adaptor, thus degrading the quality of the signal and consequently compromising the measurements. In Figure 1, a picture of a magnified connector is shown. The dark gray circle corresponds to the fiber cladding and the small light gray circle is the fiber core. One picture for a clean connector and one picture for a dusty connector are shown.

![Clean connector](image1)
![Dirty connector](image2)

**Figure 1**

SOFO Lite Unit employs E2000/PC connectors that prevent most of the problems related with dirty connectors. However, in case of need, the connectors can be cleaned using a wiper suitable for delicate tasks and isopropyl alcohol, see Figure 2, or one of the tools already available for the telecommunications market.
To clean the connector of the SOFO sensor, see Figure 2, first lift the lid in front of the zirconia ferrule (white part inside the connector) and then slide the flat top of the ferrule on a wiper impregnated with isopropyl alcohol. Do not touch the ferrule tip.

To clean the connectors of the optical channels located inside the SOFO Lite Unit, first, unscrew the detachable panel, see left of Figure 3, where all the optical channels are and then apply the procedure described in the paragraph above, see Figure 2, for each of the connectors on the internal side of the detachable panel, see right of Figure 3. In order to avoid confusion, each connector on the inside shall be detached and cleaned at once, so that it is plugged back to the correct optical channel in the detachable panel.

![Figure 2](image1.png)

![Figure 3](image2.png)
**System communication**

The SOFO can provide data via Ethernet interface using SCPI commands. The supported Ethernet communication speeds are 10/100 Mbps, and the Ethernet port is auto configuring with auto cross-over TX/RX. The Ethernet port has two LEDs, one for the connection and the other for the activity. Query commands are available through the port 3500. A list of the main commands is hereinafter described:

### Status Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>:STAT?</td>
<td>:ACK:1</td>
</tr>
</tbody>
</table>

**Example:**

**Command**: :IDEN?
**Answer**: :ACK:SMARTEC:SOFO Lite v1.0:10:046 840 200 XXX:20160219

**Example:**

**Command**: :STAT?
**Answer**: :ACK:1

### System Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Answer</th>
</tr>
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</table>

**Example:**

**Command**: :SYST:DATE?
**Answer**: :ACK:2016:02:19

**Example:**

**Command**: :SYST:DATE:2016:02:19
**Answer**: :ACK

**Example:**

**Command**: :SYST:TIME?
**Answer**: :ACK:12:27:34
:SYST:TIME:HH:MM:SS
Sets the date of the real-time clock of the SOFO Lite interrogator. The time is defined as «HH:MM:SS».

Example:
Command :SYST:TIME:12:28:00
Answer :ACK

:SYST:IPAD:NNN.NNN.NNN.NNN:NNN.NNN.NNN.NNN
Sets the IP address and the subnet mask of the SOFO Lite interrogator. The default address is "010.000.000.010:255.000.000.000". After the command, the SOFO Lite interrogator will automatically restart and the status LED will start blinking.

Example:
Command :SYST:IPAD:192.168.002.100:255.255.255.000
Answer No reply

:ACQU:MEAS:CHAN:X?
Acquires the computed values of the SOFO sensors in the X channel of the SOFO Lite interrogator. The first value corresponds to the DL in millimeters and the last value corresponds to the peak quality. To retrieve measurements from all channels simultaneously "A" must be used in the channel definition. The answer is a string that can have the following formats

- To the measurement request of a single channel N :ACQU:MEAS:CHAN:N? the answer has the syntax ACK:ProgrNum:MeasChN:QIChN
  Where:
  - ACK: it is a string and indicated that the command is correct and it has been successfully processed
  - ProgrNum: it is a progressive index that it is updated on a new measurement
  - MeasChN: it is the DL of the sensor in millimeters connected to channel N
  - QIChN: it corresponds to the peak quality index of channel N

- To the measurement request of all channels :ACQU:MEAS:CHAN:A? the answer has the syntax ACK:ProgrNum:MeasCh0,MeasCh1,...,MeasCh11:QICh0,QICh1,...,QICh11
  Where:
  - ACK: it is a string and indicated that the command is correct and it has been successfully processed
  - ProgrNum: it is a progressive index that it is updated on a new measurement
  - MeasChN: it is the DL of the sensor in millimeters connected to channel N
  - QIChN: it corresponds to the peak quality index of channel N

Example 1:
Command :ACQU:MEAS:CHAN:0?
Answer :ACK:752:11.8932:179

Example 2:
Command :ACQU:MEAS:CHAN:A?
Answer :ACK:132:23.6502,12.5424,0,10.3401,0,0,18.9334,0,0,10.8327,0,20.5664:1029,1203,147,968,25,87,1136,37,83,785,28,1209
Example 3:

Command: :ACQU:MEAS:CHAN:1?
Answer: :ACK:2381:0.0000:0 (no sensor connected)

:ACQU:CONF:THRE:CHAN:X?
Queries the threshold value for the peak detection algorithm in the X channel of the SOFO Lite interrogator. The threshold is an integer value from 0 to 256

Example:
Command: :ACQU:CONF:THRE:CHAN:2?
Answer: :ACK:10

Sets the threshold value for the peak detection algorithm in the X channel of the SOFO Lite interrogator. The threshold is an integer value from 0 to 9999

Example:
Answer: :ACK

A wrong command or a command send with an improper syntax will return a :NACK answer.
Introduction

General Information

The aim of this document is to provide an overview on the SOFOLiteConfigurator software that is used to configure the SOFO Lite Reading Unit. For more information concerning the SOFO Lite reading unit refers to the SOFOLite User Manual.

In the next section it will explained how to use the SOFOLiteConfigurator to configure and test the SOFO Lite.

SOFO Lite: SOFOLiteConfigurator

The SOFOLiteConfigurator is a software used to configure the SOFO Lite Reading Unit. The minimum hardware requirements to run the SOFOLiteConfigurator on a PC are resumed on Table 1:

Table 1 Minimum hardware requirements for a SOFOLiteConfigurator

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>dual-core, 1.9GHz minimum per core</td>
</tr>
<tr>
<td>RAM</td>
<td>2 GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>20 GB</td>
</tr>
<tr>
<td>Ethernet Card</td>
<td>10Mbit Ethernet</td>
</tr>
<tr>
<td>Operating System</td>
<td>At least Windows XP sp3</td>
</tr>
</tbody>
</table>
The SOFO Lite Configurator is developed on C#, it does not require any installation (except for the Microsoft .NET Framework 4.0 that can be downloaded from https://www.microsoft.com/en-us/download/details.aspx?id=17851). The SOFO Lite Configurator can be downloaded at the following link:

https://goo.gl/sQr8dB

To install the software simply unzip the file SOFOLite.zip on folder (it is recommended to do not unzip the file on system folders).

Double click on the icon for the SOFO Lite Configurator.exe program to start.

The SOFO Lite Configurator main interface, GUI Graphic User Interface, is the following:
On the top there is a section where it is possible to specify the IP address of the SOFO Lite and where all the main information of the unit, once the connection has been established, are resumed. In this section are available the following properties:

**IP Address**: it is the IP of the SOFO Lite

**Connect**: this button is deputed to establish a connection with the unit

**Identification**: if the connection is successfully established this field contains the main information about the version, serial number, ...

**Status**: if the connection is successfully established this field contains the actual status of the reading unit. This value is regularly updated.

This is the typical interface when the connection to the unit is successful:

![SOFO Lite Configurator interface](image)

The central part of the SOFOLiteConfigurator interface is organized into three main panels, that are enabled only when a connection to the unit is established. These panels are designed for the following tasks:

- **Change IP**: the purpose of this panel is to give the possibly to change IP address and the network mask of the connected SOFO Lite
• Measurement: the purpose of this panel is to measure and visualize on a graph the measurement of a SOFO sensor connected to physical channel of the unit

• Advanced: the purpose of this panel is to provide a diagnostic tool of the reading unit, and at the same time to modify some measurement parameters. This panel is supposed to be used only by an expert user under the Smartec direction. The improper modification of some measurement parameters could cause an unexpected behavior of the reading unit.

Change IP Panel
In this panel is possible to change IP address and the network mask of the connected SOFO Lite. The Change IP panel contains general information:

IP Address: it is the new Internet IP Address to be set on the SOFO Lite reading unit

Network Mask: it is the new Network Mask to be set on the SOFO Lite reading unit

Change IP: this button tries to upload the new setting on the SOFO Lite. If the operation succeeds the reading unit restarts to with the new setting and the message “New IP sets successfully” is shown:
After the successful network modification of the SOFO Lite the SOFOLiteConfigurator preconFigures the new IP Address to use and waits for a new connection to the unit:

Measurement Panel
The purpose of this panel is to measure and visualize on a graph the readings of a SOFO sensor connected to a physical channel of the unit.

The Measurement panel contains general information:

Channel: indicates the channel of the reading unit to which the SOFO sensor is connected to.

Automatic Search: the measurement panel provides the possibility to take the readings of the SOFO sensor connected on the selected channel in two different ways. If the Automatic Search is checked the measurement is obtained executing the algorithm for the peak detection directly on the unit. On the other hand if the Automatic Search is not checked the peak detection is done externally by the SOFOLiteConfigurator. The external processing of the optical trace, aimed to find the peak, results to be a bit more accurate respect detection done automatically inside the unit. On the other hand the external processing is around ten time longer respects to the one done by the unit (1Hz).
Start Acquisition / Stop Acquisition: with this button is possible to start and to stop the acquisition.

An example the Measurement Panel during the measurement of a SOFO sensor is the following:
**Advanced Panel**

The purpose of the Advanced panel is to provide a diagnostic tool of the reading unit, and at the same time to modify some parameters. This pane is supposed to be used only by an expert user under the Smartec direction. The improper modification of some parameters could cause and unexpected behaviour of the reading unit.

The Advanced panel can be divided into two main sections. The Channel section, that contains actions that are applied on a single channel, and the section at the bottom that contains general actions more oriented to the reading unit.

The Advanced panel contains general information:

- **Channel**: contains a set of action that will operate on the selected channel of the reading unit
- **Active Channel**: indicates the channel of the reading unit
- **Threshold For Peak Detection**: in this area is possible to retrieve the actual threshold for the peak detection active on channel (using the **Get** button) and set a new one (using the **Set** button)
- **Save the Double Interpolated OSAT**: in this area is possible using the **Save** button to save on a text file the double interpolated OSAT. Once the acquisition and the saving are done a message shows the location and the name of the file created.
Save the FFT Trace of the SOFO Sensor: in this area is possible using the Save button to save on a text file the FFT Trace of the SOFO Sensor computed inside the unit. Once the acquisition and the saving are done a message shows the location and the name of the file created.

System Calibration: in this area is possible to retrieve the System Calibration index set for the specific unit (using the Get button) and set a new one (using the Set button). This parameter is used to convert the location of the measurement peak of the OSAT to mm, as consequence if improperly changed it will change all the future values of the SOFO sensors.

Direct Command: is a text where it can be typed a TCP command to send to the reading unit (for more information concerning the syntax of the TCP Commands recognized by the unit refers to the SOFOLite User Manual).

Send: with this button is possible to send the TCP command written on the Direct Command textbox to the unit.

Tips: with this button is possible to show a list containing all the commands accepted by the SOFO Lite. On the shown list can be selected a pre-configured command that will be copied Direct Command textbox.

An example of the list of commands shown when the button Tips is selected is shown in the following Figure:

An example of an answer to a TCP command is shown in the following Figure:
# Troubleshooting Guide

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
</table>
| It is impossible to communicate with the reading unit |  - Check if the IP address of the PC is in the same range / domain of the IP address of the SOFO Lite unit  
    - Check if the reading unit is powered on  
    - Try to restart the PC and the reading unit to see if this fix the issue  
    - Check if the Unit is answering to the Ping command  
    - If the unit is connected throw an Ethernet switch try to connect it directly to the PC  
    - Check if there is not another device that is already communicating with the unit |
| Not able to measure the SOFO Sensor                |  - Check if the sensor is properly connected to the channel  
    - Check if the reading unit is powered on |
- Check the continuity of the optical path (junction box, ...)
- Try to clean the connectors
- Check if the proper channel of the unit has been selected
- Try to measure the sensor using the SDB using sensor type: SOFO Lite Single channel
- Using the SDB Set in the channel property of the sensor to save the opt, take some measurements and then using the SOFOMeasVisualizer.exe control if the peak is present inside the measurement range of this sensor

**Getting Assistance**

Support for the SDB is provided directly by SMARTEC SA.

To get support contact SMARTEC SA by one of the following means:

- E-mail: support@smartec.ch.
- Fax: +41 91 610 18 01
- Tel: +41 91 610 18 00 (workdays 9 AM to 12 PM and 2 PM to 5 PM GMT + 1)
- Address: SMARTEC SA, via Pobiette 11, CP, CH-6928 Manno, Switzerland

To facilitate the user support, please be ready to indicate which version of SOFO Lite you are using, the serial number of the reading unit, date on when the reading unit has been bought, and connection scheme of the system.
Any questions or comments regarding this guide please report to:
support@smartec.ch
Introduction

General Information

The aim of this document is to provide an overview on the SOFOLiteRecorder software that is used to configure the SOFO Lite Reading Unit.

For more information concerning the SOFO Lite reading unit refers to the SOFOLite User Manual.

In the next section it will explained how to use the SOFOLiteRecorder to configure and test the SOFO Lite.

SOFO Lite: SOFOLiteRecorder

SOFOLiteRecorder is general-purpose program designed to provide the user a tool for collecting data from 1 or more SOFO Lites. SOFOLiteRecorder is the preferred program for recording data as text files over extended periods. SOFOLiteRecorder enables the user to:

- define recording sessions and save data.

The minimum hardware requirements to run the SOFOLiteRecorder on a PC are resumed on Table 1:

Table 2 Minimum hardware requirements for a SOFOLiteRecorder

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>dual-core, 1.9GHz minimum per core</td>
</tr>
<tr>
<td>RAM</td>
<td>2 GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>20 GB</td>
</tr>
<tr>
<td>Ethernet Card</td>
<td>10Mbit Ethernet</td>
</tr>
<tr>
<td>Operating System</td>
<td>At least Windows XP sp3</td>
</tr>
</tbody>
</table>
The SOFOLiteRecorder is developed on C#, it does not require any installation (except for the Microsoft .NET Framework 4.0 that can be downloaded from https://www.microsoft.com/en-us/download/details.aspx?id=17851). The SOFOLiteRecorder can be downloaded from the following link:

https://goo.gl/sQr8dB

To install the software simply unzip the file SOFOLite.zip on folder (it is recommended to do not unzip the file on system folders).

The SOFOLiteRecorder is initialized on the base of an ini file located on the same folder where the application resides. Before launching SOFOLiteRecorder connect your SOFO Lite devices to your computer or network. To launch SOFOLiteRecorder double-click the SOFOLiteRecorder icon. The software always loads the last saved configuration.

The SOFOLiteRecorder device tab screen is the following:

The top part of the SOFOLiteRecorder interface is organized into four main panels that are designed for the following tasks:

- **Devices**: the purpose of this panel is to give the possibly to add or remove SOFO Lite from the list of the units to measure.
- **File**: the purpose of this panel is to specify where to save the measurement files and to specify the saving criteria.
• **Duration**: the purpose of this panel is to specify when the acquisition should start and stop.
• **Setting**: the purpose of this panel is save the current setting or to restore the default.

**Devices Panel**

In this panel is possible to add or remove SOFO Lite from the list of the units to measure and at the same time enable or disable the existing unit. The Devices pane contains the following information:

- **Devices list**: is a list that contains all the SOFO Lites created, it is composed by four columns:
  - **Active**: it allows to activate or disable a specific unit
  - **Name**: identification of the reading unit
  - **IP address**: IP address used for communicating with the unit

**Add SOFO Lite**: this button allows adding a SOFO Lite reading unit to the list. Once this button is clicked a form to input the data of the SOFO Lite is shown:

![SOFO Lite Info form](image)

In this form (named SOFO Lite Info) are available the following information:

- **SOFO Lite Name**: Identificator of the sofo Lite, it is the name that will be displayed on the device list
- **IP Address**: it is the IP address of the SOFO Lite to add
- **Ok**: this button adds the SOFO Lite to the list of the units
- **Cancel**: this button allows to close the form without add the unit

**Remove Selected SOFO**: this button allows to remove the SOFO Lite reading unit from the list.
File Panel

In this pane of the SOFOLiteRecorder the parameters associated with saving the data, can be configured. The user can specify the directory where to save these data, file formats, and file duration sizes.

The information available on this panel are:

Recording Directory: it allows to select the directory where to save the measurements

File Split: in this frame all the options to control a new file when created are available:

- **None**: the data will be saved on a single file that will have the name of the reading unit and the extension txt
- **Time**: specifies every how many hours, minutes, and seconds create a new file. The file name will have the following syntax:
  ReadingUnitName_YYYMMDDhhmmss.txt
- **Size**: specifies the size in megabytes of the file. A new file is create when this file is reached and the file name will have the following syntax:
  ReadingUnitName_YYYMMDDhhmmss.txt
Duration Panel

The Duration panel specifies the recording session timing and duration. All times are referenced to local times based upon the host PCs clock.

The information available on this panel are:

Start: the purpose of this panel is to specify when the acquisition should start. The acquisition can start based on two different conditions that are:

- Immediately: the acquisition starts as soon as the button start recording is pressed
- Date/Time: in this area the user can specify the timestamp on when the acquisition has to start. The acquisition starts immediately if when the button start recording is pressed the time has already elapsed.

Stop: it in this frame are available the options to control when create a new file:

- Duration: specifies the timespan of the acquisition, that is, the amount of hours, minutes, and seconds.
- Date/Time: in this area the user can specify the timestamp on when the acquisition has to stop. The acquisition stops immediately if when the button start recording is pressed the time has already elapsed.
- Continuous: the acquisition is permanent
Settings Panel

The purpose of this panel is to save the current setting or to restore the default.

The information available on this panel are:

**Save Current**: saves the actual settings on the ini file located in the same folder of the SOFOLiteRecorder.

**Restore Default**: restores the default settings on the ini file located in the same folder of the SOFOLiteRecorder.

Data Recording and visualization

Once the devices have been configured, and the recording session details specified, the user can initialize the recording session by left clicking the check box next to the device(s) to record, and then press the **Start Recording** button. Once a recording session begins this button changes to a **Stop Recording** button. When using the delayed start function press this button to commit your start schedule.
When the acquisition starts a chart visualizing the data of each sensor is shown:

The chart shows real time the measurements of all the SOFO sensor detected. A new data is added every 1 second. Only the last minute of data is visualized on the graph.

When the acquisition starts the data on the graph are visualized as absolute values, however it is possible to do a zeroing clicking on the icon . When the icon is pressed a zero will be done using the measurements at that specific time. This operation affects only the data on the chart and not the data saved on the text file that will be always saved as absolute values.
An example of result of this operation is shown in the following Figure:

Clicking on the icon \( \uparrow \) is possible to collapse the configuration section to obtain a larger area for the visualization of the real time chart.
The result will be the following:

Clicking on the icon is possible to expand the collapsed configuration section.

**File format**

The recorded data are saved on text file tab separated. Each unit will have its own files created based on the setting specified on the recording option panes. An example of files created with the file split option set to one hour is the following:

<table>
<thead>
<tr>
<th>Name</th>
<th>Extension</th>
<th>Size</th>
<th>Attributes</th>
<th>Modified</th>
<th>Created</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOFO Lite SN23_20161210T0846.txt</td>
<td>txt</td>
<td>388,908</td>
<td>A-A-A-A-A</td>
<td>01/12/2016 00:00:42</td>
<td>21/12/2016 00:00:42</td>
</tr>
<tr>
<td>SOFO Lite SN23_20161210T0847.txt</td>
<td>txt</td>
<td>389,071</td>
<td>A-A-A-A-A</td>
<td>01/12/2016 00:00:42</td>
<td>21/12/2016 00:00:42</td>
</tr>
<tr>
<td>SOFO Lite SN23_20161210T0848.txt</td>
<td>txt</td>
<td>389,007</td>
<td>A-A-A-A-A</td>
<td>01/12/2016 00:00:42</td>
<td>21/12/2016 00:00:42</td>
</tr>
<tr>
<td>SOFO Lite SN23_20161210T0849.txt</td>
<td>txt</td>
<td>389,080</td>
<td>A-A-A-A-A</td>
<td>01/12/2016 00:00:42</td>
<td>21/12/2016 00:00:42</td>
</tr>
<tr>
<td>SOFO Lite SN23_20161210T0850.txt</td>
<td>txt</td>
<td>389,023</td>
<td>A-A-A-A-A</td>
<td>01/12/2016 00:00:42</td>
<td>21/12/2016 00:00:42</td>
</tr>
<tr>
<td>SOFO Lite SN23_20161210T0851.txt</td>
<td>txt</td>
<td>389,213</td>
<td>A-A-A-A-A</td>
<td>01/12/2016 00:00:42</td>
<td>21/12/2016 00:00:42</td>
</tr>
<tr>
<td>SOFO Lite SN23_20161210T0852.txt</td>
<td>txt</td>
<td>389,151</td>
<td>A-A-A-A-A</td>
<td>01/12/2016 00:00:42</td>
<td>21/12/2016 00:00:42</td>
</tr>
<tr>
<td>SOFO Lite SN23_20161210T0853.txt</td>
<td>txt</td>
<td>388,982</td>
<td>A-A-A-A-A</td>
<td>01/12/2016 00:00:42</td>
<td>21/12/2016 00:00:42</td>
</tr>
<tr>
<td>SOFO Lite SN23_20161210T0854.txt</td>
<td>txt</td>
<td>389,025</td>
<td>A-A-A-A-A</td>
<td>01/12/2016 00:00:42</td>
<td>21/12/2016 00:00:42</td>
</tr>
<tr>
<td>SOFO Lite SN23_20161210T0855.txt</td>
<td>txt</td>
<td>389,044</td>
<td>A-A-A-A-A</td>
<td>01/12/2016 00:00:42</td>
<td>21/12/2016 00:00:42</td>
</tr>
<tr>
<td>SOFO Lite SN23_20161210T0856.txt</td>
<td>txt</td>
<td>388,865</td>
<td>A-A-A-A-A</td>
<td>01/12/2016 00:00:42</td>
<td>21/12/2016 00:00:42</td>
</tr>
<tr>
<td>SOFO Lite SN23_20161210T0857.txt</td>
<td>txt</td>
<td>338,872</td>
<td>A-A-A-A-A</td>
<td>01/12/2016 00:00:42</td>
<td>21/12/2016 00:00:42</td>
</tr>
</tbody>
</table>
The text files with the measurements are tab separated and the each row of data is written into the file based on the following format:

```
YYYY-MM-DD hh:mm:ss  MeasCh0  MeasCh1 ... MeasCh11  QICh0  QICh2 ... QICh11
```

Where:
- **YYYY-MM-DD hh:mm:ss**: represents the time stamp of the acquisition, as year-month-day hour:minute:second
- **MeasChN**: it is the absolute measurement in millimetre of the SOFO sensor connected to channel N. If the measurement is not available a value 0 is written
- **QIChN**: it is the quality index of the SOFO measurement of the sensor connected to channel N. If the measurement is not available a value 0 is written

An example of file is the following:

```
2020-03-26 10:29:14 11.0978 0 0 14.7751 0 50.1230 17.8087 0 0 0 0 14.7751 143 0 0 231 0 0 0 0 0 0 0
2020-03-26 10:29:14 11.0978 0 0 14.7751 0 50.1230 17.8087 0 0 0 0 14.7751 143 0 0 231 0 0 0 0 0 0 0
2020-03-26 10:29:14 11.0978 0 0 14.7751 0 50.1230 17.8087 0 0 0 0 14.7751 143 0 0 231 0 0 0 0 0 0 0
2020-03-26 10:29:14 11.0978 0 0 14.7751 0 50.1230 17.8087 0 0 0 0 14.7751 143 0 0 231 0 0 0 0 0 0 0
2020-03-26 10:29:14 11.0978 0 0 14.7751 0 50.1230 17.8087 0 0 0 0 14.7751 143 0 0 231 0 0 0 0 0 0 0
```

**TROUBLESHOOTING GUIDE**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
</table>
| It is impossible to communicate with the reading unit | • Check if the IP address of the PC is in the same range / domain of the IP address of the SOFO Lite unit  
• Check if the reading unit is powered on  
• Try to restart the PC and the reading unit to see if this fix the issue  
• Check if the Unit is answering to the Ping command  
• If the unit is connected throw an Ethernet switch try to connect it directly to the PC  
• Check if there is not another device that is already communicating with the unit |
| Not able to measure the SOFO Sensor | • Check if the sensor is properly connected to the channel  
• Check if the reading unit is powered on  
• Check the continuity of the optical path (junction box, ...)  
• Try to clean the connectors |
- Check if the proper channel of the unit has been selected
- Try to measure the sensor using the SDB using sensor type: SOFO Lite Single channel
- Using the SDB Set in the channel property of the sensor to save the opt, take some measurements and then using the SOFOMeasVisualizer.exe control if the peak is present inside the measurement range of this sensor

Getting Assistance

Support for the SDB is provided directly by SMARTEC SA.

To get support contact SMARTEC SA by one of the following means:

E-mail: support@smartec.ch.
Fax: +41 91 610 18 01
Tel: +41 91 610 18 00 (workdays 9 AM to 12 PM and 2 PM to 5 PM GMT + 1)
Address: SMARTEC SA, via Pobiette 11, CP, CH-6928 Manno, Switzerland

To facilitate the user support, please be ready to indicate which version of SOFO Lite you are using, the serial number of the reading unit, date on when the reading unit has been bought, and connection scheme of the system.