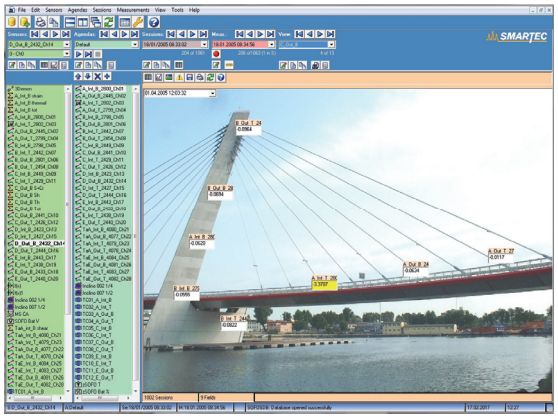
SMARTEC

SDB Software

Software



**CONTROL OF SOFO READING UNIT,
INTEGRATION OF THIRD PARTY SENSORS
VISUALIZATION AND DATA MANAGEMENT**

The new SDB Software is an integral part of all SMARTEC Monitoring Systems and includes all the features of former SDB VIEW and SDB PRO. SDB is designed for the static data acquisition, data representation and for the control of SOFO and MuST reading units, ADAM modules, FISO, SOFO optical switches, and other data acquisition devices.

Description

The main functions of this software are aimed to measure sensors either interactively with the user or automatically according to a pre-defined schedule. The operator can view on-site the sensor's measurement history in graphical and tabular form.

The program stores all information related to a given project in a single database structure. All data can be easily exported to **SDB** advanced analysis packages and third-party software including MS Excel and MS Access.

Multiple users can access the same **SDB** file simultaneously from different PC (locally or remotely over a modem or LAN).

SDB provides a simultaneous display, within the same window, of several different views on sensors chosen from the database over a defined monitoring period. The display can be of a tabular or a graph plot with associated options such as thresholds plot, colors and sounds on alert, software actions on alert (e-mail, SMS).

The "measurement" value of a macro-sensor is obtained by applying a mathematical functions (defined by the user) to the measurements carried out by real sensors (SOFO, MuST, thermocouples, etc.), and stored in a **SDB** database. The definition of macro-sensors is performed using a user-friendly interface. The representation and properties of this sensor are the same as for real sensors, i.e. they can be visualized in tables and diagrams, and even further used to obtain higher level macro-sensors. In this way meaningful macro-sensors can be created such as average curvature sensor (obtained from two parallel sensors), average shear strain sensor (obtained from two crossed sensors), thermal strain sensor (obtained form temperature measurement), load sensor (obtained as difference between total strain and thermal strain), etc.

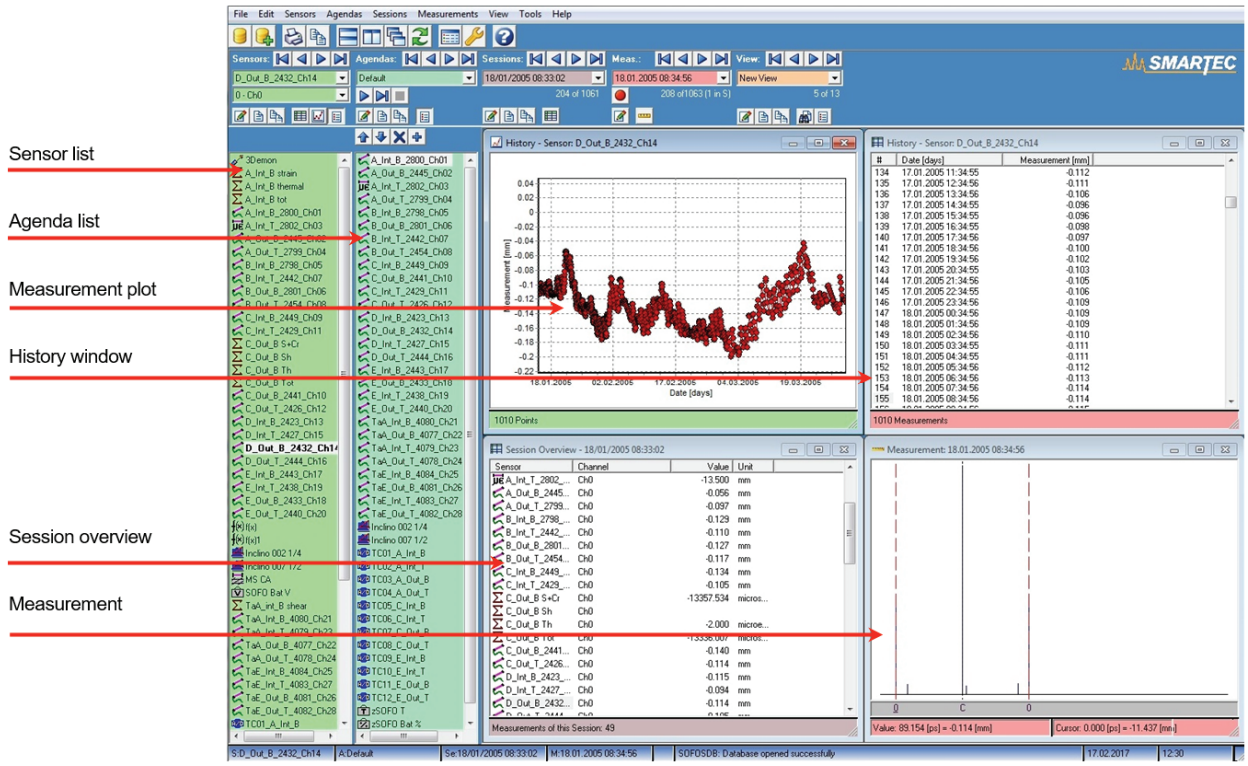
Key Features

- Automatic sensors configuration
- Automatic measurement analysis of single sensors
- Automatic and scheduled static measurements
- Project results stored in a single relational database
- Direct sensor history display
- Compatible with Third Party sensors
- Automatic data export
- Display of measurements at different points on the picture of the structure
- Graphic and table history display of selected sensors over selected period
- Real time data visualization
- Pre-warning and warning alert levels, SMS, e-mail, software action on alert
- Save the results in HTML, XML format
- Data publication on FTP site
- Simplifies real-time interpretation, visualization and analysis of measurements
- Combines real sensors using complex mathematical functions to create more powerful sensors
- Allows the measurements of MuST, ADAM, Read From File, Vibrating wire sensors
- Real-time calculation and presentation of indirectly measured parameters

Main Functions

Measurement functions	Measurement of all types of SOFO sensors, Optical switches control, MuST Sensors, FISO Sensors, Vibrating wires, Measurement of ADAM sensors (Third Party sensors), Results storage in the SDB structure.
Display functions	Scan display, Peak positions, Sensor history graph, Sensor history table, Session overview.
Automatic and scheduling functions	Sensor measurement programming, Looped or scheduled measurements.
Long term static data acquisitions	In order to optimize the Database size and performance, the SDB is suitable for the management of long term static monitoring projects with maximal data acquisition frequencies of 6 measurements/hour (typical)
Hardware requirements	
Processor	Min. Pentium III
RAM memory	Min 256 Mb
Hard Disk	Min 1 GB free
Display	Min 1024 x 768

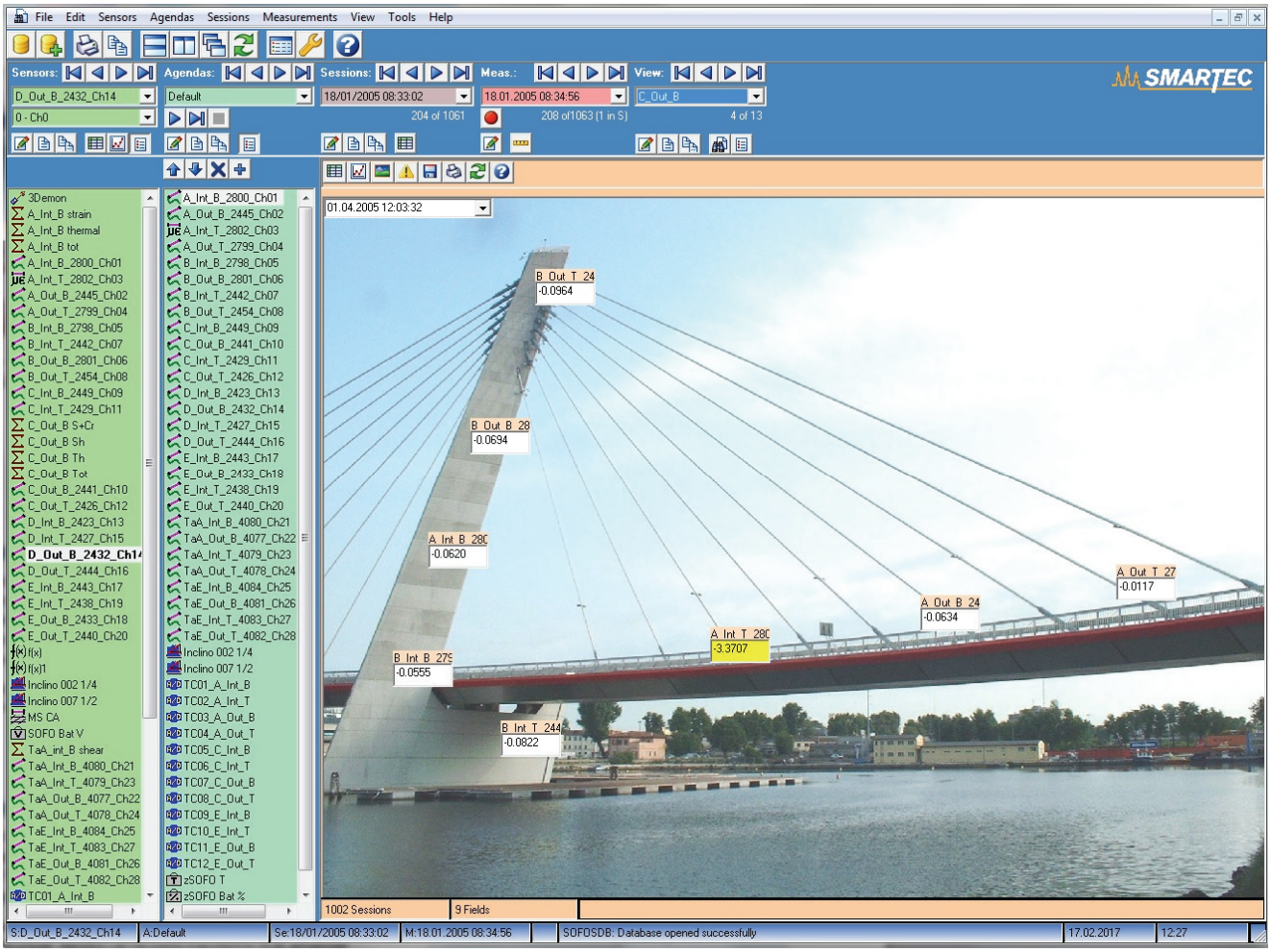
Main Functions

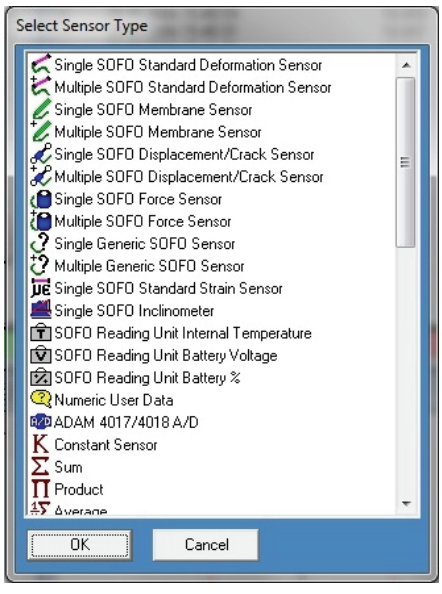


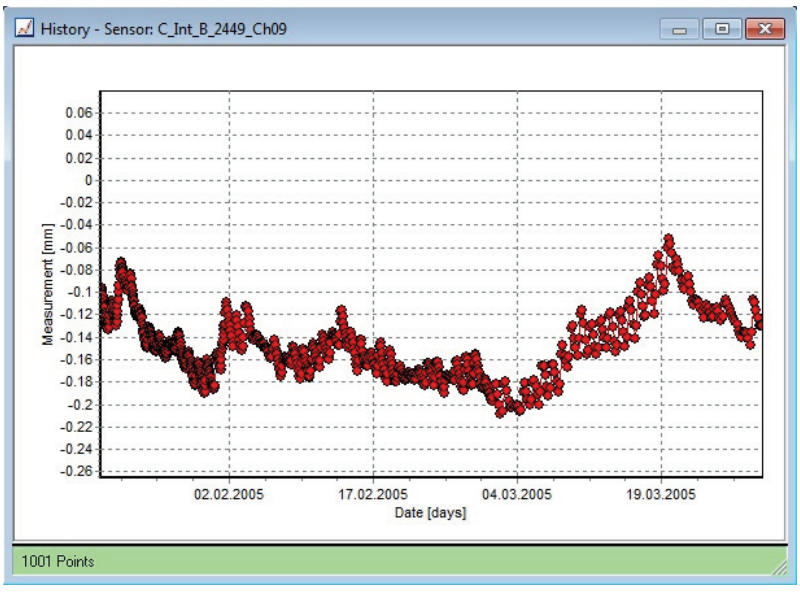
Software requirements

• SDB software requires Windows ™ to run. Compatible with Windows versions from Windows 98™ to Windows 10™. Microsoft Excel™ and Microsoft Access™ are recommended to export the data for further analysis and representation, but are not required to run SDB.

SDB Software Screen Shots







SDB Pro Sensors

MuST Sensors	Allows the measurement of the FBG sensors connected to the MuST reading unit	
MuST SOFO Sensors	Allows the measurement of the SOFO sensors connected to the MuST reading unit	
Thermocouples	Allows to measure at the same time all the thermocouples connected to an ADAM module	
Vibrating wires	Allows the measurement of the vibrating wire sensors	
Complex Mathematical Function	Allows to define complex mathematical sensor using as variables the reading of the standard sensors	
Read From File	Allows to read the measurements directly from a text file	
Concrete Analyzer	This sensor is designed to help interpretation of the results of average strain measurements performed on concrete members using the SOFO system	
Sum	$F(s)=\sum_{i=1}^{n} K_i * S_i$	Linear combination of sensors Si using user-defined coefficients ki, i=1 to n
Product	$F(s)=\prod_{i=1}^{n} S_i^{\,c_i}$	Product of sensors Si powered with user-defined exponents ci, i=1 to n
Max	$F(s)=\max(S_i)_{i=1,n}$	Maximum value of sensors subset Si, i=1 to n
Min	$F(s)=\min(S_i)_{i=1,n}$	Minimum value of sensors subset Si, i=1 to n
Average	$F(s)=\frac{\sum_{i=1}^{n} S_i}{n}$	Average value of the sensors Si, i=1 to n

SDB Pro allows between others the calculation of the following parameters:

Average measured strains	Bending moments	εεm Average theoretical Strain
Thermal induced strains	Curvatures	Eεs Theoretical Strain due to load
Temperature corrected strains	Stiffness	εϕT Theoretical Creep
Creep and shrinkage effect isolation	Gradients	EεT Theoretical Thermal Strain
Normal forces	Shear Forces	Eεsh Theoretical Total Shrinkage

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