

MobilControl MC6600 SmartVision

Electronic multi-channel service measuring and analyzing device for pressure, differential pressure, temperature, volume flow, rotation speed and other standard signals.

Displays input signals numerically and graphically, along with minimum/maximum values.

Records up to 240,000 samples with sample intervals from 1 ms to 10 seconds. The device can be controlled via iPad app or open-source PC software.



General

The MobilControl MC6600 consists of 6-channel SensorBox with measuring electronics and charging unit. An new-generation iPad is used as display (or alternatively a standard PC). Display and SensorBox are connected wireless via Bluetooth® LE (Low Energy).

Accu and charging unit

The charging unit is able to charge iPad and SensorBox at the same time. The SensorBox contains a Lilon battery which lasts up to 14 days, if used several hours a day. We recommend to charge the SensorBox whenever it is not needed. This ensures a long battery life. With an empty battery it takes about 6 hours to charge it to 90 % of the maximum capacity.

The SensorBox electronic protects the battery from overloading and over-discharging.

Please do not expose the device to extreme temperatures. When disposing the device, please stick to the regulations for Lilon batteries.

SensorBox

The image shows the six push-pull Lemosa connectors, marked with individual colors (at the bottom). On the right the charging connector, the on/off button and the mode LED.

Sensor connectors: Oil resistant original IIT cables, standard length 3 meters, 10 meters optional.

Please insert the cables only into the female SensorBox connectors with the same color-code.



Please check the leak-tightness when connecting the sensors to the hydraulic system.

Push on/off button 3 seconds switches the SensorBox on (LED blinks).

Push on/off button 2 seconds switches the SensorBox off.

Automatic power-off, if 15 minutes no measurement.

ATTENTION: Please turn the SensorBox off, only if the iPad app has been terminated. Then the Bluetooth reconnection is fast.

Inputs

The SensorBox allows you to connect any 4-20-mA sensor (powered with 12 V) to the first four channels. Their ranges and units can be configured by the user. On channel 6 you can connect rotation sensors, as well as flow sensors. Therefore this manual and the software sometimes use the notation P1 to P3 (pressure), T (temperature), Q1 and Q2 (flow) according to the default usage. Or the channels are simply called P1 to P6.

Default ranges

P1: 4...20mA, 10...600 bar or other ranges and units

P2: 4...20mA, 10...600 bar or other ranges and units

P3: 4...20mA, as above, plus diff. pressure P1-P2 (P1 > P2, otherwise no value displayed)

T: Temperature 125 C/500C or other ranges and units

Q1: Sinus 40 mVpp to 5 Vpp, max. 5 different flow sensors, 2-pole connection, 10 Hz...9.99 kHz, ranges 1...600 l/min (gpm-types possible)

Q2: Sinus 40 mVpp to 5 Vpp, max. 5 different flow sensors, 2-pole connection, 10 Hz...9.99 kHz, ranges 1...600 l/min (gpm-types possible)

Q2: 6-...24-V infrared reflection sensor, 3-pole connection, 300...9999 U/min (rpm), 1 or 2 reflection marks (if signal extremely asymmetric, lower limit is higher)

Q2: hydraulic power, calculated with $P1 \cdot Q1 / 600$, automatic unit conversion even if mixed unit sensors present: bar, psi, lpm, gpm(US), kW, HP (PS)

The differential pressure range presumes that P1 is greater than P2, otherwise no value is displayed. But the used ranges can be different (e.g. 100 bar for P1 and 10 bar for P2).

Channel 5 and 6: These ranges should be defined with lpm or gpm (always interpreted as US galone).

Channel 6: The measured frequency is always converted to rpm, which is identical to U/min, no matter which unit is defined for the rotation ranges.

If 4-20-mA 3rd-party sensors are used which don't deliver a valid signal within 500 ms after power has been applied, the trigger function in the offline-record mode might be faulty.

The precision of the measurements depends on the errors of the SensorBox and the sensors. The tolerance of the SensorBox channels is smaller than +/- 0.5 %

from maximum range +/- 1 digit in the normal mode (see User modes). In fast mode and in offline-record mode the tolerance is smaller than +/- 1 % of full-scale +/- 1 digit.

Display unit

New-generation iPad/iPadPro with „MobilControl MC6600 SmartVision“ app. Updates via AppStore.

Silicone protective cover with tilt handle, one-hand handling, horizontal and vertical display modes for all channels including differential pressure and hydraulic power. The wireless control of the SensorBox which can be located several meters away (20 feet or more) is the outstanding feature of the MobilControl MC6600 SmartVision device.

Recommended user settings:

- Bluetooth® activated
- Auto-Lock: Never

The second item prevents the device from sleeping and locking while you are measuring. Set with: Settings -> Display&Brightness -> Auto-Lock -> Never

MobilControl App

This description presumes some knowledge about the handling of an iPad or iPhone.

Momentarily this section is not up-to-date and not translated completely.

Betriebsarten

Normal Mode:



Current numeric reading, Min/Max reading with graphical representation of the recent 60 seconds.

Fast Mode:



Channels 1-3 are displayed with 1000 samples per second (1 kHz), maximum time 1 minute.

Offline-Record Mode:

Will be described shortly.

Basic usage App/SensorBox

In order to communicate with the SensorBox the iPad must establish a Bluetooth® connection first. Therefore the SensorBox must be powered and the iPad must have been prepared for the connection (settings/Bluetooth/on). Please leave this setting at the on position in order to minimize the time for establishing a new connection.

If you have problems with the Bluetooth connection, see the Appendix.

In order to prevent the iPad from going to sleep mode during a measurement session please follow the advice given in the section *Recommended user settings* above.

You should also take care that the SensorBox is not turned off while the app is running. Always terminate the app if it is not needed (click app's STOP button, double click iPad's *Home key*, and wipe app window out of the screen to the top).

Connect app with SensorBox

Start the app by touching the symbol of the SmartVision app. On the screen the 6-channel display appears, the so-called normal mode.

The bars at the top right of the screen show the remaining battery capacity, All green means battery full, no green bars left means you should charge the SensorBox battery.

Meaning of the buttons

All of the operating modes are available via the buttons described here, with one exception: The areas displaying the digital values of channels 1 to 3 (P1 to P3) allow you to change to the so-called *fast mode*. If you touch one of these areas you get into the fast mode of this particular channel. See section „Fast Mode“.



SBOX

Button color grey, touch to establish the Bluetooth connection.

Button color yellow, search for SensorBox.

Button color green, SensorBox connected.

Button color green, touch to start measuring, color changes to red.

STOP

Stops the measurement, freezes the display, reduces the power consumption drastically (therefore you should use STOP as soon as the measurement is not of any further interest). Changing to another mode or using the SET button is only possible if no measurement is running.

CLEAR

Clears the display.

SCREEN

Stores the current screen as image in the image folder of the iPad. You can share the images with iPad standard methods, for instance via e-mail, sms, or WhatsApp (e.g. send it to you office where you can make PDFs for customer reports).

SET

Change to the SET page where you can configure the SensorBox. Please note that you can use the PC software for this task, as well.

BACK

This button exists on the SET page and on the fast mode pages. It brings you back to the normal mode. If in a subwindow of the SET page, it brings you back to the SET page.

Meaning of the buttons on the SET page

DEVICES

If more than one SensorBoxes are within reach, you can select one for communication. Each SensorBox has an individual name (SVxxxx). The selection menu appears also if there are more than one SensorBoxes within reach after touching the START button.

RANGE

Range selection. After you have selected the appropriate ranges for your sensors, press SAVE to store the selection, wait until it changes to white and press BACK.

Each line corresponds with an individual channel. Pressing a range field and SAVE sends the selection to the SensorBox and the related normal mode area

will show the correct full-scale value. The appropriate sensors must be connected to the related inputs.

The setting is stored in the SensorBox, so you have to change the range setting only if you change to another sensor for a channel.

Durch Auswahl von P3/RANGE 1 wird das Fenster für Kanal P3 auf Differenzdruck-Darstellung (P1 minus P2) umgeschaltet. Wenn P2 kleiner als P1 ist, werden keine Werte angezeigt. P1 und P2 dürfen auf unterschiedliche Bereichsendwerte eingestellt sein, z. B. auf 60 bar und 10 bar. Ist Differenzdruck-Darstellung gewählt, kann P3 nicht mehr für den Fast-Mode verwendet werden.

Die Volumenstrombereiche von Q1 und Q2 sind mit allen drei Wertepaaren gekennzeichnet, damit eine eindeutige Zuordnung der entsprechenden Sensoren möglich ist.

Durch Auswahl von Q2/RANGE 3 wird das Fenster für Kanal Q2 auf die Darstellung der hydraulischen Leistung umgeschaltet. Sie wird mit $P1 \cdot Q1 / 600$ (in kW) berechnet.

Q2/RANGE 4 und 5 wählen die Drehzahlmessung mit einem oder zwei Reflexmarken aus.

PROJECT

Tragen Sie hier einen Projektnamen ein (Kundenname, Auftragsnummer etc.). Er erscheint auf den mit SCREEN erstellten Bildern und auf Fotos, die mit dem CAMERA-Button erzeugt wurden.

CAMERA

Nimmt ein Foto auf und speichert es im Foto-Ordner ab. Der Projektname, falls eingetragen, ist eingeblendet.

INFO

Zeigt Kontaktangaben des Herstellers / App-Entwicklung / Versions-Nummer und Enthält die digitale Bedienungsanleitung.

LPM CONFIG

(wird vom Hersteller vorgenommen)

Konfiguration der Volumenstromturbinen. Wird beim Hersteller für die mitgelieferten Sensoren eingetragen. Der Endbenutzer sollte sich im Klaren sein,

dass er mit fehlerhaften Einträgen die Volumenstrommessung unbrauchbar machen kann.

Für die Kanäle Q1 und Q2 können 5 + 2 unterschiedliche Turbinen konfiguriert werden (Q11..Q15 und Q21..Q22). Die drei Wertepaare auf dem Typenschild der Turbine werden in der Reihenfolge, in der sie auf der Messturbine aufgedruckt sind, in die jeweilige Zeile eingegeben. Danach Button UPDATE am Ende dieser Zeile und BACK betätigen.

Nach der korrekten Konfigurierung stehen unter RANGE die entsprechenden Bereiche zur Verfügung.

CALIBRATE

(wird vom Hersteller vorgenommen)

Kalibriert die Kanäle P1 bis P3.

Der Endbenutzer sollte sich im Klaren sein, dass er damit die Druckmessung der Kanäle P1 bis P3 unbrauchbar machen kann.

Falls diese Betriebsart benutzt wird, dürfen vor dem Drücken des CALIBRATE-Buttons keine Sensoren an P1 bis P3 angeschlossen sein.

Fast-Mode



Die Kanäle P1 bis P3 können bis zu eine Minute lang mit 1000 Messungen pro Sekunde aufzeichnen. Um in den so genannten Fast-Mode zu gelangen, tippen Sie in der 6-Kanal-Darstellung in den Digitalwert-Bereich des jeweiligen Kanals.

Starten Sie die Messung mit START und beenden Sie sie mit STOP. Nach einer Minute stoppt die Messung automatisch.

Das obere Fenster enthält die Gesamtdarstellung des Signals und die Min/Max-Werte. Das untere Fenster dient zur genaueren Untersuchung des Signalverlaufs an einer bestimmten Stelle.

Ist die Messung fertig, dann tippen Sie im oberen Fenster auf eine Stelle, die Sie besonders interessiert. Ein Abschnitt von 2 Sekunden Dauer wird dann oben rot markiert und im unteren Fenster erscheint genau dieser Signalabschnitt.

Beim ersten Antippen einer Stelle im unteren Fenster setzen Sie einen Referenzpunkt auf der Kurve. Beim nächsten Antippen definieren Sie den Messpunkt. Der Text links oben zeigt Ihnen nun die Zeit- und Druckdifferenz zwischen beiden Punkten. Bei weiterem Antippen entsteht ein neuer Messpunkt und der alte Messpunkt wird zum Referenzpunkt.

Mit zwei Fingern, wie bei iPad und iPhone üblich, lässt sich die Darstellung vergrößern, so dass im Fenster ein Bereich von weniger als 2 Sekunden zu sehen ist.

PC-Software

As an alternative to the iPad the SensorBox can be controlled with the PC-program

mc6600-control.py

which is available for Windows 10/64 Bit and (on request) for Linux.

The program

mc6600-doctool.exe

is used for analyzing and preparing inspection protocols.

Both programs are open-source, which means you can use or change them for your own purposes. This allows you to integrate the SensorBox in your IT own structure, e.g. controlling automated test systems.

The program *mc6600-control.py* has been developed in Python 3. The necessary Python interpreter comes with the SensorBox and is subject to the license terms stored in the program folder.

mc6600-doctool has been developed with the open-source version of Qt5. For this program is also a Linux version available on request. The license terms can be found here

<https://www.qt.io/>

The software can be downloaded from the suppliers web site

<http://www.iitfluid.com/>.

There you will also find a video, containing a short tutorial (see Sensoren & Systeme).

The software can be executed from an USB stick without installing it on the PC. That means, the service guy can take measurements from a foreign PC without changing anything on this PC. Sample data are stored on the stick and can be taken home without Internet connection.

Please read the related section in the Appendix.

Please note that the PC software is open-source. It is not part of the MC6600 product and there is no guarantee for it. You find the license terms in the file COPYING.

Execute mc6600-control from harddisk

The SensorBox can be used in simulation mode, which delivers test signals on all of the channels without sensors. Volume flow channels must be configured before they can deliver (simulated) values.

The program mc6600-control can be started in simulation mode with a special command line option. The shortcut and the batch file with "simulation" in their names do exactly this.

Execute mc6600-control from usb stick

If you want to execute the program from an USB stick, install it on the stick as described in the Appendix. Insert the stick into an USB connector and navigate with the Explorer to the base directory of the stick (e.g. D:) and then to the subdirectory

mc6600

Then double click on one of the batch files "start-...". Do not use the predefined shortcuts if you execute the programs from the stick, as they start the program from you Documents folder.

Program usage

The program depends on a stable Bluetooth connection with the SensorBox. If that is not the case it can crash, so that it can be terminated only with the task manager (Ctrl-Alt del) in the worst case. Therefore please make sure the SensorBox is always located within 20 feet from the PC.

The Bluetooth dongle delivered with the SensorBox connects automatically with the Box as soon as both are powered on, provided the Box is not yet connected to another device (e.g. iPad). The pairing between the dongle and its individual SensorBox has been done in the factory. Therefore please don't try to send commands to the Dongle with programs other than the ones mentioned in this manual.

Please don't delete or rename files in the program folder (apart from the case mentioned in the Appendix).

User directories

There are three directories in the program folder which contain user data:

data

contains test curves and is used for saving and loading signal data recorded with the SensorBox. These data are stored as comma-separated lists which can be imported to Excel sheets.

pdf

contains pdf files created with mc6600-doctool.

templates

contains templates for inspection protocols which can be created with the mc6600-doctool.

Explanation of program functions

In the following boxes represent program buttons: grey background relates to the main window, white background relates to sub-windows.

Start

All of the channels are sampled and displayed once a second. The lines under the channel reading show: channel name, full-scale value, min/max value since Start has been pressed.

Stop

Sampling is stopped.

Clear

Readings are deleted from the display. After ranges have been changed in Set this button updates the channel/full-scale display.

Set

Range selection

In the Set dialog you can choose the range for each channel (click SET field) which is related to the connected sensor.

Range-Save

Store the settings in the SensorBox.

General remark: The SensorBox remembers all of the settings done with the control program. That means, it can be controlled with any computer without losing information.

Adjust full-scale values and units

Range-Reset

Sets the full-scale/value pairs shown in the upper section of the Set window to their default values.

If you use sensors calibrated for other units, you can enter the respective full-scale value and the unit to the appropriate field. The following rules apply:

- units can be 1 to 3 characters long
- maximum full-scale value 9999
- the full-scale values of the first four channels (P1..P4) must be identical to the values the connected sensors deliver at 20 mA.

The full-scale values of channels 5 and 6 designate the scaling of the normal-mode graphics in the iPad app. The graphics will be cut off at this value, but the digital display still shows greater values.

The field for the pressure difference P1-P2 is set automatically depending on the selected range for P1. Full-scale value and unit are taken from P1. As the condition $P1 \geq P2$ applies, the pressure difference cannot be greater than the full-scale value of P1.

The full-scale value of the hydraulic power field $P1*P5$ is calculated from the selected ranges for P1 and P5, and it depends on the unit in the $P1*P5$ field. The value is rounded to the next integer (or one decimal if smaller than 1):

If you change the entry in the $P1*P5$ field, please make sure that there are a value and a unit in the field, otherwise the change has no effect.

When the hydraulic power is selected in P6 you will get meaningful results only if:

- P1 ranges are in bar or psi (can be mixed)
- P5 volume flow ranges are in lpm (liter per minute) or gpm (US galone per minute)

If $P1*P5$ is set to *kW* or *hp* or *HP* (horse power), you will get the reading in the chosen unit, no matter if you use bar, psi, lpm or gpm sensors.

Please keep in mind that the exact spelling of the units is essential (not Bar or Psi for instance).

Differential pressure will be displayed correctly only if P1 and P2 are set both to bar or psi. P1 must be greater than P2, but the ranges can be set to different full-scale values.

Enter characteristics of volume flow sensors

There are seven ranges for volume flow sensors in the channels P5 and P6.

In order to store the characteristics of these sensors in the SensorBox enter the frequency/flow pairs (which are normally printed on the sensor) into the appropriate line and click

Save

on the right of the line. Each number is separated from the following number by a blank character (more than one blanks allowed).

Value pairs must be entered in the order "highest frequency first".

Back

Back to the main window.

Record

Start a SensorBox recording in offline mode. After this action you can quit the window or the program.

Please make sure the SensorBox doesn't switch off due to weak batteries. We recommend to use the external power supply for this operation mode, as a recording can take up to some days.

The green LED shows the current operating mode of the SensorBox.

- blink rate 3-times per second: wait for command
- blink rate 5-times per second: offline recording started but trigger threshold not reached yet
- permanent light: recording or data transfer active

As soon as the recording has finished, the SensorBox can be switched off. The data are permanently stored until a new recording will be started (or in case of weak batteries).

A running recording can be interrupted with the Stop button or by switching off the SensorBox. Data collected before the interruption can be fetched with the transfer function (Transfer button), provided at least 1000 samples have been stored.

Recording parameters

Before starting a recording you have to adjust the recording parameters:

Trigger Conditions: Channel selects the trigger channel, threshold sets the threshold where you want the recording to start (in percent of the full-scale value of the recording channel). Edge pos means, recording is triggered as soon as the trigger signal becomes greater than the threshold (Edge neg means the opposite).

You can trigger with any of the first four channels and record them. Click P1 to P4 as you wish with the following restriction:

- *You can select one, two, or four channels (not three).*

Timing: With "Nr of Samples" you choose how many samples will be recorded. "Time Base" defines the sample interval. "Duration" shows the recording time.

If you select 1 ms and four channels, the recording can take up to 1 minute. This extends to 2 or 4 minutes if you record only two channels or one. According to these parameters the recording time can get very very long if you choose the maximum time base of 10 seconds.

Analyze

This button opens the Analyze window.

Transfer

Reads last recording from the SensorBox.

The program might run on Windows prior to version 10. In this case the proper driver for the USB-serial adapter (FTDI) might have to be installed.

Depending on the speed of the PC and the environment conditions (distance to SensorBox, radio interference, etc.) the transfer speed can vary. The default speed of the program is relatively low in order to reduce errors. With this setting a recording of 4 channels, 1 ms sample interval, 1 minute, is transferred in about 2:10 minutes. This can be reduced to 1:10 minutes, if you are willing to take the risk of interrupted transfers (see "Command line options" in the Appendix).

Right mouse button

Click the graphics field with the RIGHT mouse key and the P1-P4 values along with the trigger time and the cursor time are displayed.

As the ranges of the recorded channels can be different, the y axis shows the percent-value of the respective full-scale. The numeric representation of the signals at cursor time show the real values according to the selected ranges.

Save

Saves the offline recording as file in csv format (which can be read by Excel).

Load

Loads a previously stored csv file into the graphics field. The iPad app for controlling the SensorBox generates files in the same format.

Control elements on the lower left border of the program window

Here you can activate and deactivate pan and zoom functions for the graphics window with the left mouse button. And you can save the whole graphics window as image.

When you save or load files the file name remains on the lower left corner. You can use meaningful names which relate to your current project.

Inspection protocols with mc6600-doctool

See also *Install mc6600 software* in the Appendix.

Start the program *mc6600-doctool* by double clicking the shortcut as explained in the previous chapter or the *start-doctool* batch file, in case you want to work on the usb stick.

Program usage

After starting the program you see the document area on the left (text editor), above the icons for working with the text editor, on the right the diagram area, and below the main usage area.

A rectangular button with a light gray background and a thin black border, containing the text "LoadDiag" in a standard sans-serif font.

With this button you can load a signal file (fetched from the SensorBox with `mc6600-control /Analyze /Transfer`) into the diagram area. You can zoom in by dragging over an area with the left mouse button. The two symbolic buttons above the "Quit" button reset the 100-% view or fit the curves into the window (WindowFit).

The x axis shows the number of samples and the y axis shows the amplitudes of the curves in percent of their full-scale value.

Set cursor marks

You can set a cursor mark by clicking with the RIGHT mouse button into the diagram area. This mark displays the real values of the curve amplitudes above the diagram. Clear the marks with the left mouse button or when changing the displayed area.

Legend

If the checkbox *legend* is checked, a legend field is inserted into the diagram.

A rectangular button with a light gray background and a thin black border, containing the text "LoadTempl" in a standard sans-serif font.

This buttons and SaveTempl load and save text files which are used as templates for inspection protocols. You can format the text by means of the task bar above the document area (select text by dragging over it with the left mouse button, then click an element on the task bar).

Insert image into document

Image files (png, jpg, jpeg) stored in the work folder *templates* can be inserted into a template file by clicking on the left element in the task bar. In case you load an image from a directory other than the work directory, the image is first copied to the work directory and then loaded from there. The reason is, that the text file contains only links to images and we want to have the image files in the same directory.

PDF<-Diag

Clicking this button inserts the current diagram into the document at the cursor location. You can vary width and height within reasonable limits by changing the values of the WxH spin boxes. Diagrams or images can be deleted, copied or aligned like ordinary characters.

ATTENTION: Diagrams are not stored with the template files.

SavePDF

The SavePDF button generates a PDF file from the current text file (inspection protocol).

Work flow

Alle these functions lead to the following work flow:

LoadDiag -> right mouse button (set cursor mark) ...change displayed area .. set cursor mark ..
-> LoadTempl -> PDF<-Diag -> insert more diagrams into text file -> SavePDF

Appendix

Install mc6600 software

If the python programs don't run after the installation described below, you might have to install the appropriate update for your computer from this website:

<https://support.microsoft.com/de-de/help/2999226/update-for-universal-c-runtime-in-windows>

Please see also possible instructions on the IIT download site (readme.txt).

Download the installation file *mc6600-xxx-install.exe* from the IIT website, double click it and follow the instructions.

Now there are the two folders *mc6600* and *WPy64-3760* in the destination folder.

You can start the programs by double clicking one of the shortcuts in *mc6600*:

mc6600 control

mc6600 control simulation

mc6600 doctool

or by using the shortcuts on the desktop if you have checked the related box during installation.

USB-Stick

In order to configure a stick for this task, run the downloaded installation file and choose the usb-stick path (e.g. D:\) as destination folder. Do not check the "shortcut box". Use the batch files "start-..." for starting the programs (not the shortcuts). If you install the software this way, there is no conflict with an already installed version on the harddisk and nothing is installed on the PC.

Command line options (for experts)

The program *mc6600-control.py* can be called with several command line options. The option `-h` lists the choices.

You can also have a look at the batch files *start-..* where you will find more information.

Bluetooth® connection with iPad klappt not working

If the Bluetooth connection with the iPad doesn't work anymore, even if you terminate the app and restart the SensorBox, please execute the following instructions:

Deactivate Bluetooth in the iPad settings.

Start the app.

Choose "settings" from the appearing message box.

Change Bluetooth switch to ON,

Change to MobilControl app and press SBOX.

Bluetooth®-with PC not working

The program mc6600-control.py presumes that the SensorBox and the Bluetooth dongle both are powered up.

Dongle and SensorBox have been paired at the factory.

After being started the program sends a SensorBox command via all of the available COM ports. As soon as there is an answer, the respective COM port is chosen for communication.

If after the program start a window appears, saying "No SensorBox found...", then please check the following:

- SensorBox on (you might want to switch it off and on),
- Bluetooth dongle inserted,
- more than one program instance running,
- SensorBox already connected with another device (e.g. iPad).

If you have no success please get in touch with your supplier.

Button in mc6600-control doesn't react anymore

Delete all of the files with extension ".dat" from the program folder.

Pressure difference wrong?

The range P1-P2 might not show exactly the difference of the values displayed on the channels P1 and P2. This is due to the fact, that the SensorBox calculates with full precision internally and rounds the displayed values at the last digit.

Selecting time base for offline recording

Please keep in mind that a recording must contain at least 1000 samples per channel, which gives a minimum of 1 s with 1 ms time base, but it gives almost 3 hours if you choose a time base of 10 s. Therefore, choosing the time base as small as possible might be a good idea.

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