

Sateco XT AG

SXTSC Capacitive Silicone Force Sensor Demo Kit

Operating Manual

Version 1v02, 24.02.2021



## Confidentiality

This document is intended as basis for internal collaboration and information exchange with external partners. The content of this document is confidential and shall neither be shared nor forwarded to any other parties without prior consent of Sateco XT management.

## Modification History

Version	Date	Name	Description
1v00	08.01.2021	R. Krämer	Initial version
1v01	24.02.2021	G. Schürch	Module and measure principle documentation added (1.3&1.4)
1v02	29.04.2021	R. Krämer	Updated 2.2

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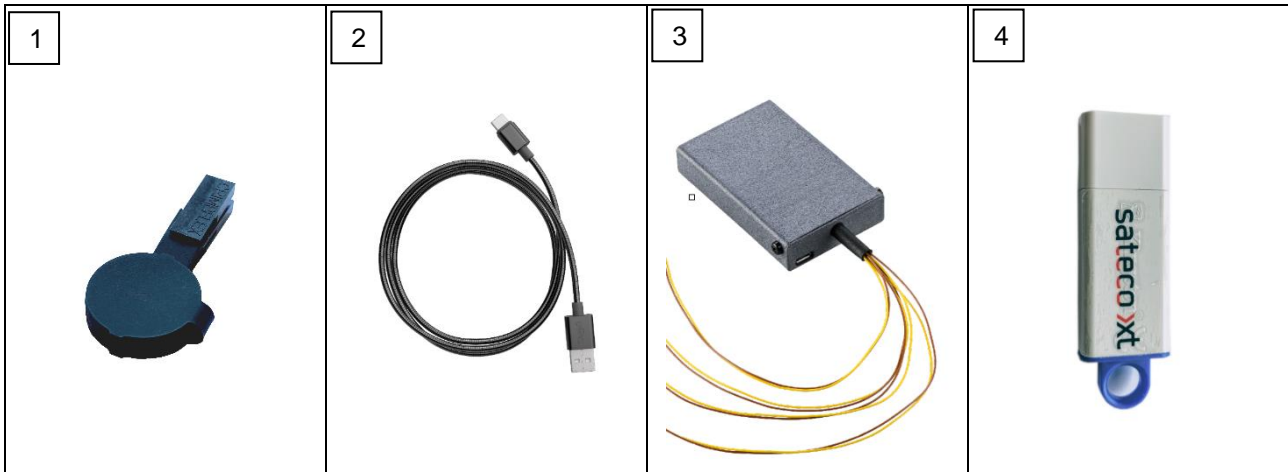
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# 1 SXTSC Capacitive Silicone Force Sensor Demonstrator Kit

## 1.1 Kit Content

The following items are delivered with this demonstrator kit.

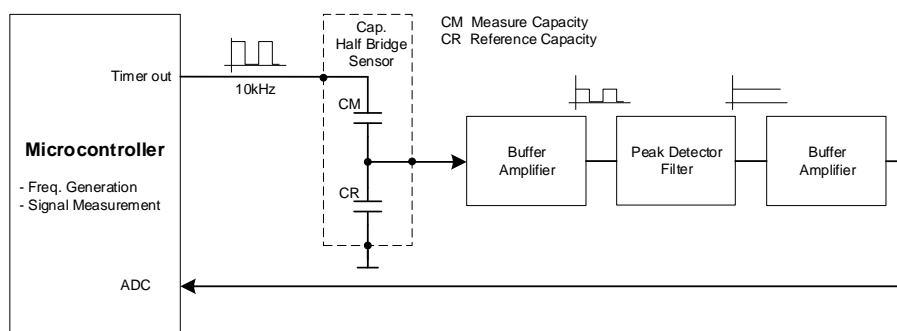


Pos.	Item	Comment
1	Sensor	SXTSC Silicone Force Sensor
2	USB Cable	USB Cable with MicroUSB Connector
3	Sensor Interface Module	Evaluation Board
4	USB Data Stick	SXT Sensor GUI Software and Documents

## 1.2 Sensor Description

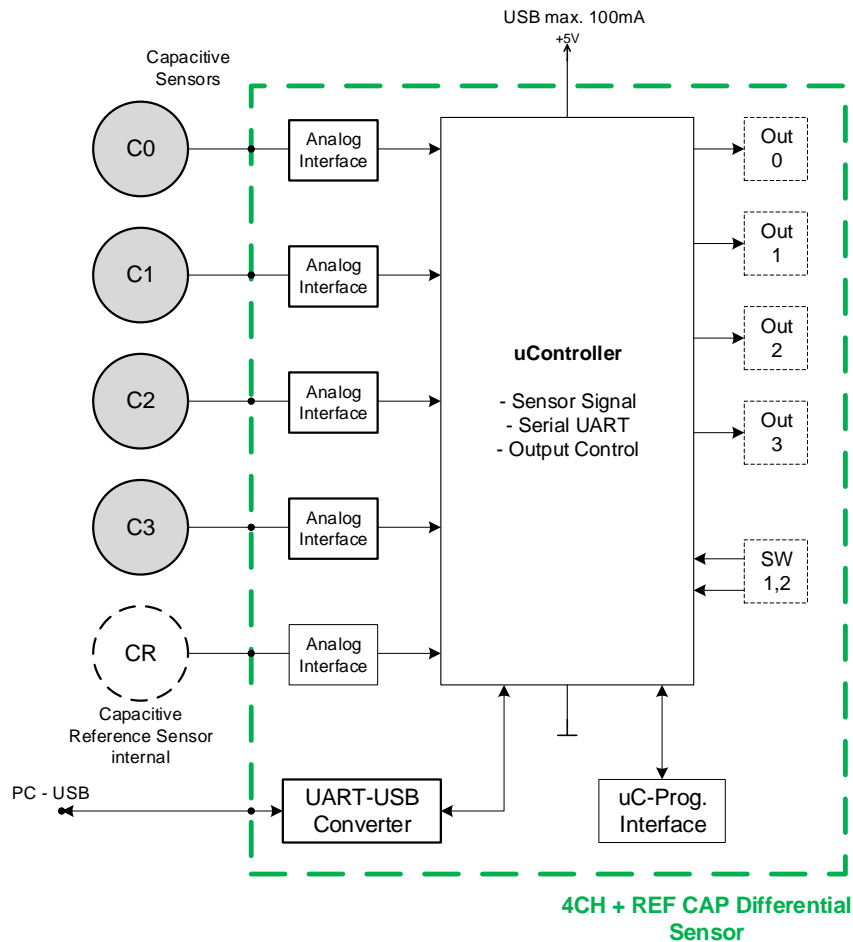
The force-sensitive SXTSC silicone force sensor operates according to the capacitive operating principle and can measure both compressive force and touch.

## 1.3 Measuring Principle



With a capacitive half bridge, the voltage changes as a result of an influence to the sensor capacitance  $C_M$ . This can be measured and digitalized by the ADC. The advantage of this measuring principle is the large capacitance work range and the optional possibility to compensate external influences like temperature or humidity measuring relatively to a reference sensor. In that case an equal sensor is used for the reference  $C_R$ .

## 1.4 SXT Sensor Module Description



Block Diagram 4CH CAP SXT Sensor Module

The SXT Sensor Module measures the force or touch of max. 4 connected sensors by use of capacitive sensing technology. The module is controlled by a small microcontroller, which interfaces to a host computer over an UART-USB serial converter. Using the included SXT Sensor GUI the measured sensor data can be visualized on a PC.

The module contains 4 channels (C0, C1, C2, C3) and one compensation channel (CR internal). The 5V from the USB Interface are used for power supply of the CAP demonstrator

The module PCB includes 4 internal digital outputs and two switch connections for optional functions. To make use of these options an individual software adaption is required. Please contact Sateco XT if your project requires further sensor functions.

## 1.5 SXT Sensor GUI Software Description

The graphical user interface is a software tool to visualize the SXT silicone force sensor data in real-time and allows user to log and store the sensor data. The SXT Sensor GUI software supports the following operating systems:

Microsoft Windows 7, 10 (both 32-bit and 64-bit)

## 2 SXT Sensor GUI Software

### 2.1 Installing the Software

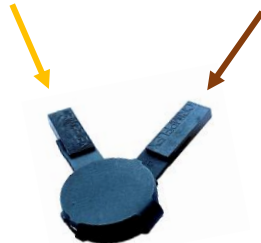
Follow these steps to install the software:

	<p>1. Run the executable setup.exe file</p>
	<p>2. Select the installation directories and click "Next".</p>
	<p>3. Read the National Instruments license agreements, select "I accept the above 2 License Agreement(s)" and click "Next".</p>

	<p>4. Disable Windows fast startup to prevent problems with installing or removing hardware and click “Next”.</p>
	<p>5. Review the summary and start the installation by clicking “Next”.</p>
	<p>6. Wait for the installation to complete, and then click “Next”.</p>
	<p>7. Restart your computer before running this software.</p>

## 2.2 Connecting the SXTSC Silicone Force Sensor with the Sensor Module

Connect each SXTSC silicone force sensor to any input channel (C0, C1, C2, C3) of the sensor module. Connect the upper electrode to the yellow wire and the brown wire to the lower electrode.



Please note, that sensor wires do not contain any active shielding and therefore may cause noise/interference on the measurement signal. If wire lengths require to be increased, we recommend to use coaxial shielded cables.

## 2.3 Connecting the SXT Sensor Module with your PC

Attach the SXT Sensor Module to a free USB port on your computer via the provided USB cable.

Please note, that once the SXT Sensor Module is connected to the USB port, the SXT Sensor Module will reset the sensor level. So always first connect the sensor to the SXT Sensor Module and then connect the USB cable.

To perform a reset of the sensor level, just disconnect and reconnect the USB cable.

## 2.4 Starting the SXT Sensor GUI

After connecting the sensor module and restarting your computer, the “SXT Sensor GUI” icon should appear on your desktop. Double click on it to start the software.





## 2.5 Navigating the SXT Sensor GUI

To navigate to Graphical, Configuration and Logging settings.

To start data streaming click the "Start" button.

To stop data streaming click the "Stop" button.

To clear the Graph Chart click the "Clear" button

To change the Amplitude Y scale, choose your preferred min. and max. value or select Autoscale



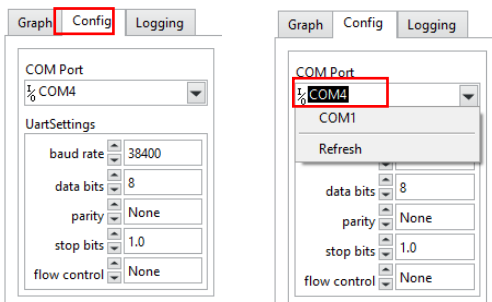
Choosing the Graph plot appearance and visible/invisible channels. To enable, disable or change the appearance, right click on this menu.

Graph Chart

To quit the GUI, click on the "Quit" button or click "Alt+F4" on your Keyboard

## 2.6 Configure the Serial Port connection

Navigate to the "Config" tab and select the correct com port. If you are not sure which com port to select, disconnect the USB cable from your PC or SXT Sensor Module and click the "Refresh" button. You will then see all com ports available which are already in use. Reconnect the USB cable and press the "Refresh" button again. Select the com port which has newly added to the com port list.

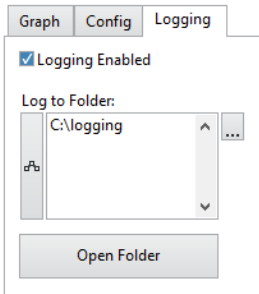



Keep the other settings like baud rate, data bits, parity, stop bits and flow control as listed above.

## 2.7 Logging Data to a File

Follow these steps to log measurement data to a file.

1. Navigate to the “Logging” tab

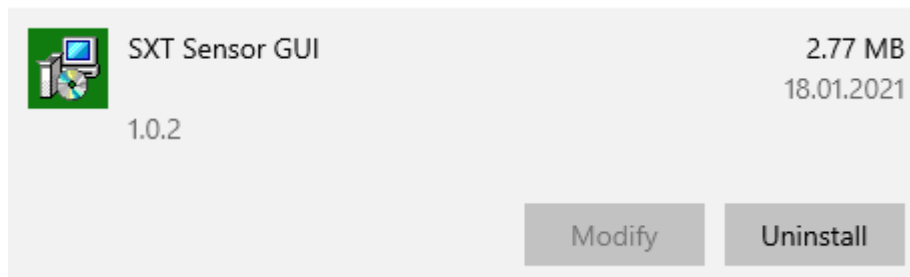


2. Select “Logging Enabled”
3. Chose a Folder  where your log file will be stored
4. To start data streaming click on the “Start” button to stop the streaming click on the “Stop” button.

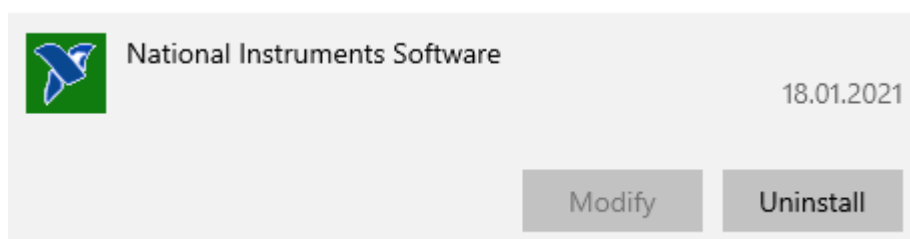
## 2.8 Uninstalling the SXT Sensor GUI

Follow these steps if you want to uninstall the software:

1. Quit/ Close the Software
2. Go to Windows Start – Settings – Apps
3. Find the App “SXT Sensor GUI”



4. Click on “Uninstall” button and confirm again by clicking on “Uninstall”
5. Find the App “National Instrument Software”



6. Click on “Uninstall” button and confirm again by clicking on “Uninstall”

The SXT Sensor GUI is based on LABView from National Instruments. If you are using any other software which requires the Nation Instruments Software, do not uninstall it.