Introduction to Thermal Stimulator in ABL

1 Introduction

These instructions are to provide information to about how to work with the Somedic MSA Thermal Stimulator in ABL. More information about the systems can be found from system manuals, which can be asked from the personnel of ABL.

Thermal Stimulator (Thermode 381) and SenseLab software are installed in the DC-room. Synchronization with Stimulus PC is implemented over serial cable.

MSA Thermal Stimulator is based on “Peltier element”; when applying a voltage on a thermocouple it causes a temperature difference between the junctions of those two metals.

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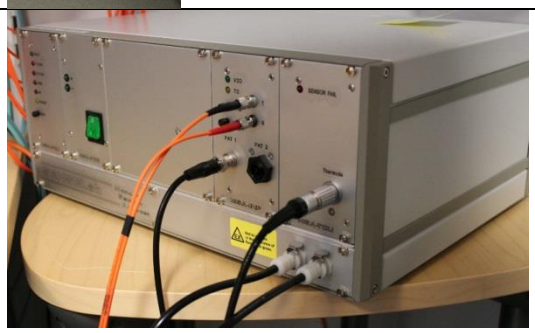
2 Wiring and components

Equipment of Thermal stimulator

Product	Image	Location
Stim PC		Control Room
MSA – Thermal Stimulator	 SenseLab Modular Sensory Analyzer Article nr: 10-010-0001 S/N: 381	Control Room
Thermode (30x30mm)	 Thermode 381	DC-Room / Control room
SenseLab optic modem	 MSA Optic receiver MSA Fiber Optic/Serial 1/f Article number: 10-010-7010 S/N: 180	Control room - DC-shelf

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Button		DC-Room / Control room
Toolkit		Control room - AC-shelf

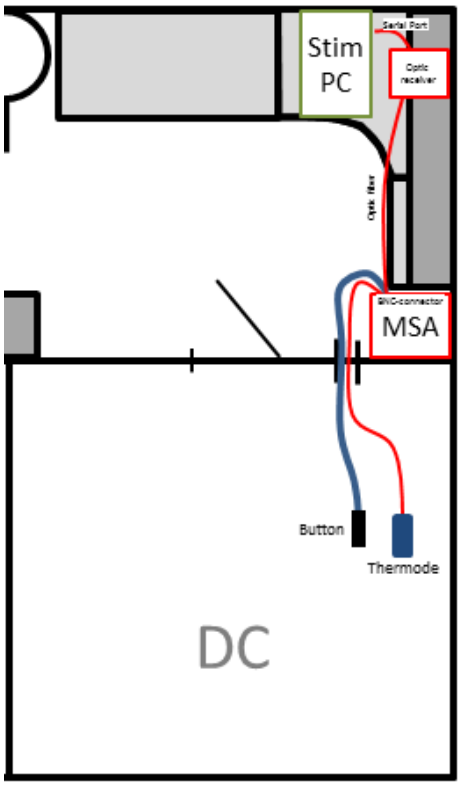

Image 1: Thermal stimulator wiring in ABL

The MSA Thermal Stimulator is located outside the shielded room. The wire of the Thermode goes through the feedthrough panel into the DC-Room. Cable of the response button is connected to BNC connector on MSA front panel and goes through feedthrough panel filter.

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Image 2: Front panel of MSA. Pat 1 = BNC connector of the response button. T and R = optic connectors for Optic receiver. "Thermode" and two white connectors at the bottom are for Thermode connectors.

Image 3: Optic fiber is connected to Optic Receiver.

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Optic fiber has two optic fibers, one with black connectors and one with red connectors. The cable should be connected so that “T”-connector on MSA is connected to “Rx” of Optic Receiver and “Tx”-connector of Optic Receiver is connected on “R” connector of MSA. The labels refer to “Transmitter” and “Receiver”.

Optic receiver is connected to Stimulus PC via serial cable (USB-serial cable) to COM3 port.

2.1) Details

Somedic MSA thermal stimulator (Somedic SenseLab AB, Norra Mellby, Sweden) with a 25 x 25 mm Peltier element Thermode (baseline 32°C, max slope 5°C/s, range 5-52°C).

3 Before measurements

3.1) Fluid levels

MSA Thermode is based on Peltier element. The system uses fluid circuit, which evaporates over time from the pipelines. Thermal Stimulator doesn’t work properly with low fluid; therefore it needs to be monitored and refilled occasionally. Amount of liquid can be checked inside the device after opening the cover by loosening two screws on the back (top).

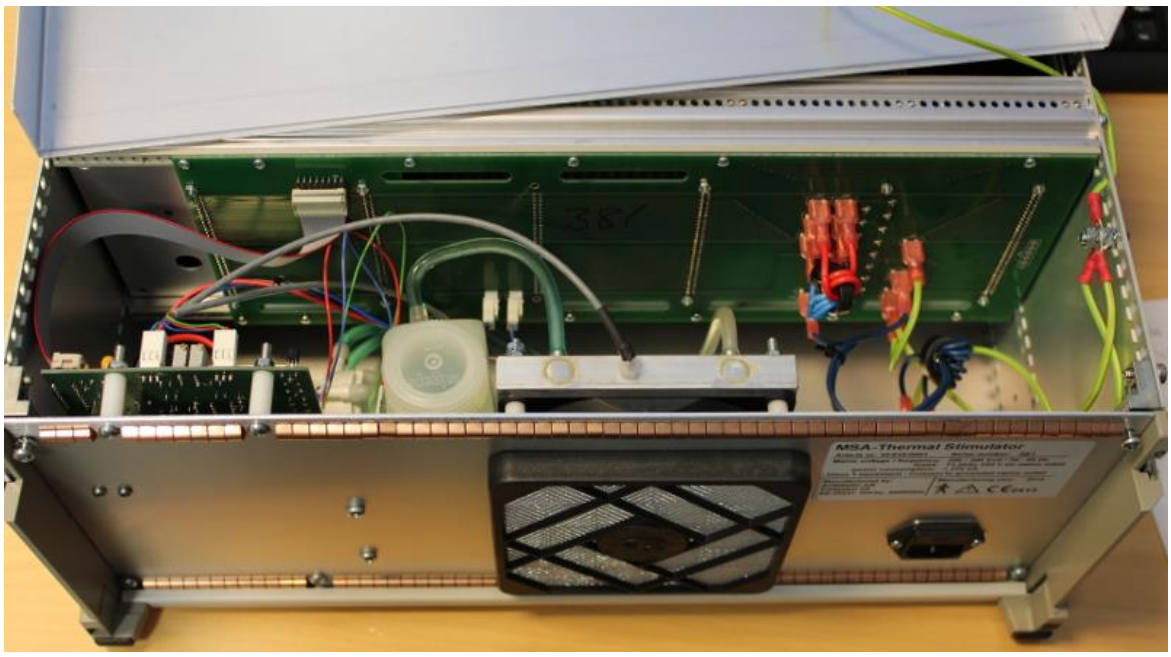

Image 4: Cover can be opened by loosening upper corner screws from the back. The white cap of the bottle can be seen on the left middle.

Check the liquid level from the marker tape on the side of the bottle. There are six lines on the tape. If the liquid goes under line 3 (from the bottom), the bottle should be refilled. Bottle is “full when the liquid reaches the top line. More liquid can be found from the refrigerator of the 4th floor kitchen.

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Liquid can be added using the syringe found from the toolkit.

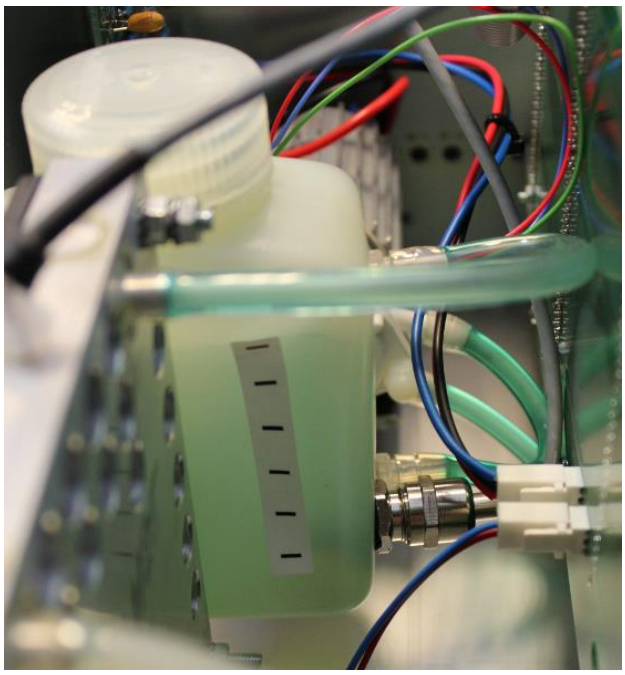


Image 5: Check the liquid level from the tape markers on the side of the bottle.

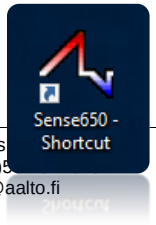
Add log information about the refill to “MSA Thermal Stimulator Log book”. Please contact personnel, if you need any help.

4 Stimulus PC

MSA Thermal Stimulator can be controlled from Stimulus PC, using Somedic’s own SenseLab software, or by controlling through SDK of the MSA. For example Presentation software has been used previously in ABL.

MSA is controlled over serial port, more precisely COM3 of STIM PC.

4.1) SenseLab



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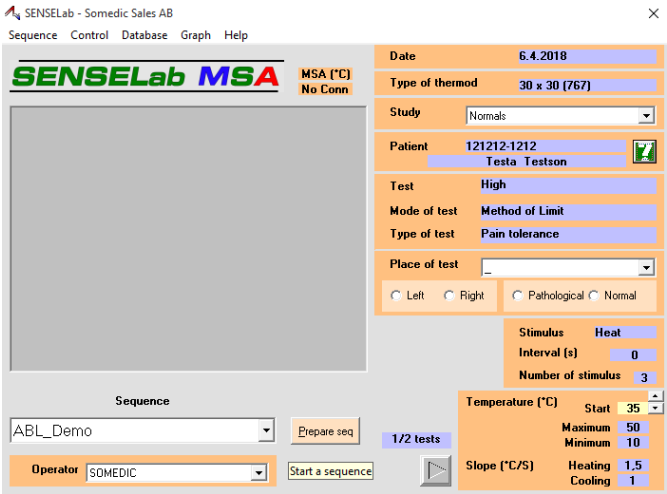
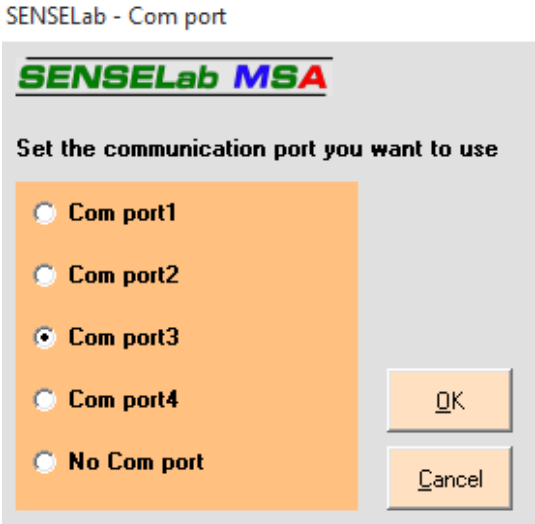
SenseLab software is installed on Stimulus PC and can be run by clicking Sense650 icon.



SenseLab communicates with MSA through serial port. “USB-serial port converter” is connected to USB port on Stimulus PC and other end is connected to optic receiver.

Open “Com Port” window by choosing “Control-> Com port window” and choose COM 3.



Define experiment sequence from “Sequence-> Settings”. Sequences can be set from Sequence window. Subject needs to be also defined before measurement.

4.2) Presentation

Set the following serial port settings when using presentation. If you are interested, please ask more details from personnel.

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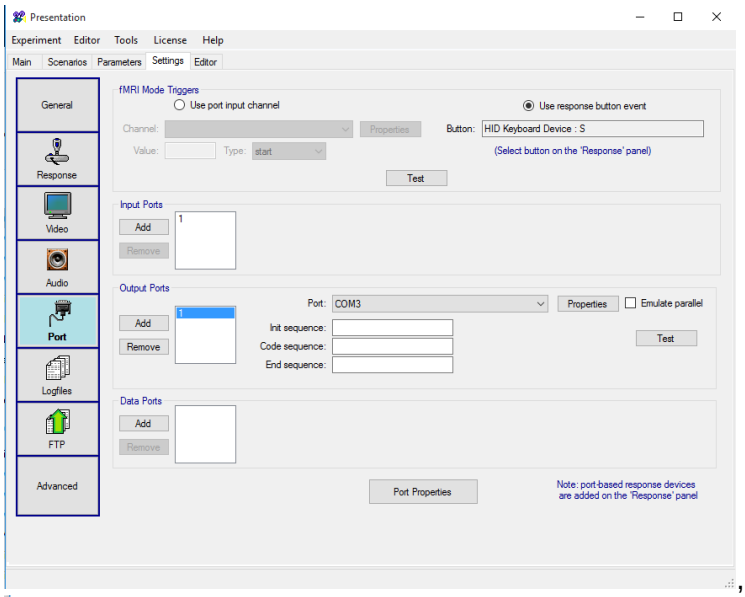

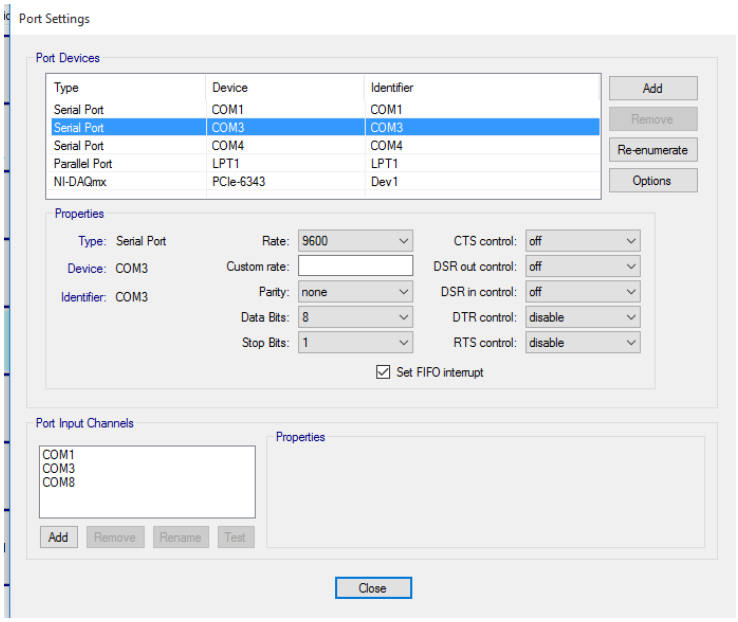

5 Measuring

Place the wanted skin area on top of the Thermode.

Subjects can be instructed to push the response button to test “first change in temperature”, “first sensation of pain” or “pain tolerance”.

Be careful not to induce too much heat for too long time for same skin area. Even “a red skin” is already a burn.

Baseline of the Thermode is 32°C, range 5-52°C, slope between 1-5°C/s.

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