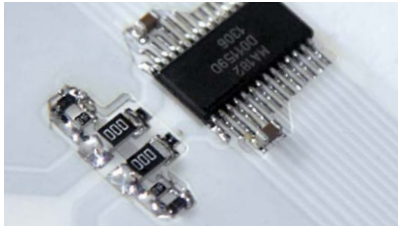


SenTec EIT Pioneer Set

Made in Switzerland to foster Open
Innovation EIT Research worldwide



Active electrodes

The SenTec EIT Pioneer Set contains 16 double-channel "EIT Chips" which interface with the attached 32 electrodes and manage the electronic signals on site.



Highly integrated electronics

Current injection, voltage signal demodulation, and artifact rejection are done by the electronics inside the Pioneer SBC Sync.

Be an EIT Pioneer!

To advance the development of EIT in general and to accelerate clinical EIT applications, SenTec, after having acquired and subsequently merged Swisstom AG into SenTec AG, decided to continue Swisstom's Open Innovation EIT Research Initiative. SenTec, consequently, continues to offer for sale the „EIT Pioneer Set“ formerly provided by Swisstom AG and now referred to as „SenTec EIT Pioneer Set“.

Tools for EIT Pioneers

- EIT advanced interface with 16 double-channel "EIT Chips" and a break-out cable to attach 32 electrodes.
- One Pioneer SBC Sync with sophisticated miniaturized electronics (FPGA-based) and software to handle the large amount of data and to output the results via an Ethernet connection
- A power and data communication interface with wall power A/C adapter
- Complete documentation of the data transfer format
- External synchronisation in- and output
- Image creation is done subsequent to data acquisition on any commercial PC attached to the SenTec EIT Pioneer Set
- Unique SenTec EIT Monitor (STEM) software

EIT advanced interface

The EIT advanced interface contains complete SensorBelt hardware which can either be connected to a resistor phantom simulating the human thorax or to external electrodes using a break-out cable. The impedance distribution in the phantom can be changed manually, automatically or by external signals. For experimental use an external electrode arrangement can be attached to the EIT advanced interface. More details can be found in the technical data sheet of the EIT advanced interface.

SenTec EIT Pioneer Set – Technical Specifications

Intended use:

The following set of EIT hardware and software components of the SenTec EIT Pioneer Set are intended for laboratory applications only. The SenTec EIT Pioneer Set is not a medical device and, consequently, is not intended for (clinical) use on humans.

The SenTec EIT Pioneer Set consists of the EIT advanced interface with 32 channels, a Pioneer SBC Sync, a Pioneer Interface Module, a power supply unit and data communication documentation.

EIT Advanced Interface

- 16 double-channel EIT chips
- 50-250 kHz AC current application
- Resistor phantom with manual action buttons, adjustable impedance change patterns, external impedance-change controls (pressure and voltage)

PC and software requirements

- Windows 7 recommended
- Minimum Java 1.7

Pioneer SBC Sync

- Programmable injection current 1 to 7 mA peak
- Programmable injection current frequency 50 kHz-250 kHz AC
- Up to 1 kOhm load impedance
- Freely programmable injection patterns
- High resolution, high speed data acquisition
- Differential and absolute voltage measurement
- 1 to 80 data frames per second (programmable)
- Connector to Interface module

Pioneer Interface Module

- Frame synchronisation output, sync input
- Power management for SensorBelt and Pioneer SBC Sync
- Provides 4 kV galvanic isolation of Pioneer SBC Sync
- Synchronization signal

A/C adapter

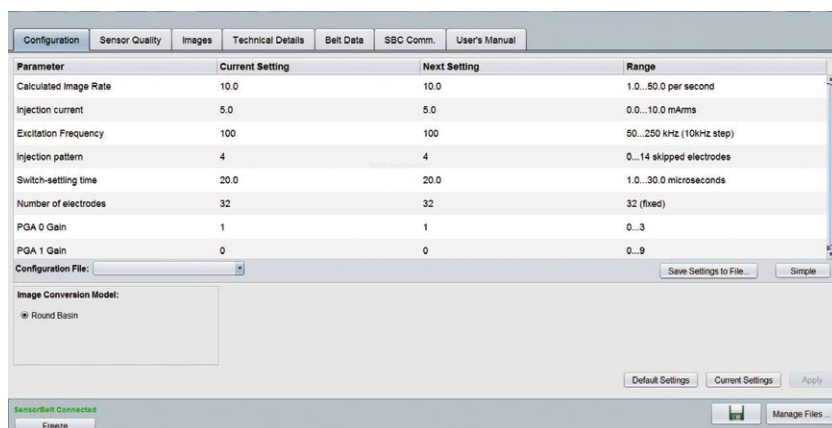
- 100 – 240 VAC 50/60 Hz

Data communication documentation

- Definition of data streams which include IQ demodulated data
- Description of programming capabilities

STEM Software

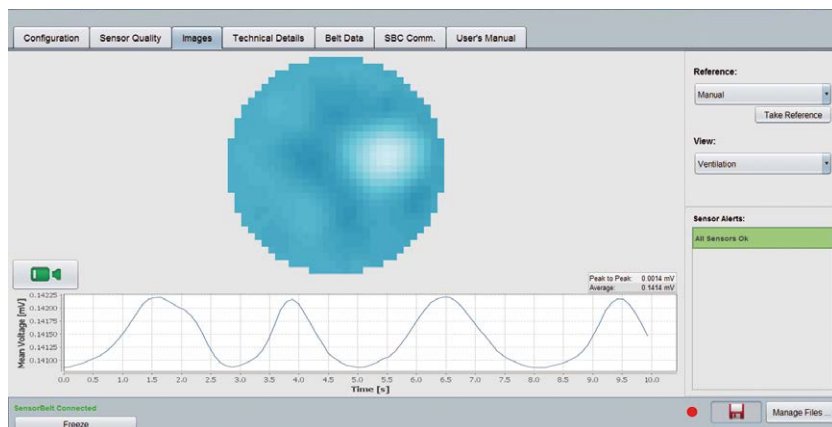
The STEM software runs on Windows PCs and communicates with the components of the SenTec EIT Pioneer Set. STEM allows setting EIT parameters such as image rate, excitation frequency, injection current and other technical parameters via the Ethernet connection. STEM provides real-time monitoring of the signals and continuous quality checks of each one of the electrodes. Storage of raw data is done at user request and in a format that is completely disclosed to enable every conceivable post-processing and signal analysis. The source code of STEM is available from SenTec upon request.



Selected screen shots of the STEM software

Configuration

Allows the user to set all operational parameters such as excitation frequency, switch-settling time, injection pattern, injection current and image rate.



Image

Reconstructed images are shown in real-time. On the bottom the composite signal of the sum of all measured voltages is displayed.



Sensor quality

Visualizes the status of all 32 electrodes in colors green, yellow and red together with respective location. Bar graphs below show contact impedance value for each electrode.

General conditions for the use of the SenTec EIT Pioneer Set

SenTec AG is offering for sale the SenTec EIT Pioneer Set with an aim to foster Open Innovation in EIT Research worldwide. SenTec, consequently, encourages users of the SenTec EIT Pioneer Set to publish results, which are made by using the SenTec EIT Pioneer Set.

At the same time, however, SenTec needs to be protected against the risk that new inventions using the SenTec EIT Pioneer Set result in intellectual property rights that might block SenTec's business. SenTec, therefore, sets forth the following conditions for use of the SenTec EIT Pioneer Set with immediate effect.

General conditions for use of the SenTec EIT Pioneer Set

The purchase and use of the SenTec EIT Pioneer Set and the use of Information (as defined below) is subject to the following conditions:

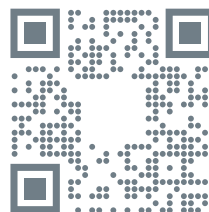
- 1) If the user of the SenTec EIT Pioneer Set makes any Improvement (as defined below), the user of the SenTec EIT Pioneer Set agrees to grant and hereby grants to SenTec, as to the Improvements and possible Intellectual Property Rights relating to the Improvement, a non-exclusive, irrevocable, worldwide and royalty-free license to use such Improvements in context with SenTec's EIT business and SenTec's EIT Products. For the avoidance of doubt, the user shall have no obligation to provide SenTec with information or assistance in context with Improvements or their use.
- 2) The user of the SenTec EIT Pioneer Set agrees to not, directly or indirectly, solicit, promote, sell, rent, manufacture or purchase any product that compete with SenTec's current or future EIT products. Direct competition is assumed in particular by products using/incorporating EIT data/ technology and/ or by products providing noninvasive monitoring of regional lung function, minute ventilation, tidal volume, and respiratory rate.
- 3) Correct mention of the product names and software versions (where applicable) of SenTec products in any publication, poster or presentation including results, which are made by using the SenTec EIT Pioneer Set.
- 4) The SenTec EIT Pioneer Set is intended for laboratory applications only. The SenTec EIT Pioneer Set is not a medical device and, consequently, is not intended for (clinical) use on humans.

Definitions

"Information": In the context of this agreement, the term "Information" shall mean any information about the format or form or content of data, which are provided, displayed or output by the SenTec EIT Pioneer Set.

"Improvement": In the context with this agreement, the term "Improvement" shall have the following meaning:

- (i) Results that are made or discovered on the basis of or by using Information or the SenTec EIT Pioneer Set or
- (ii) anything derived from such results.



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