



ESA Messtechnik GmbH

Schlossstr. 119 - D-82140 Olching / München
Telefon: +49 (0)8142 444 130 - Fax: +49 (0)8142 444 131
Internet: www.esa-messtechnik.de
E-Mail: info@esa-messtechnik.de

Signal Conditioner/Amplifier System Traveller Static



Description:

ESAM *TRAVELLER Static* is a high-performance signal conditioner/amplifier system mainly for static and quasi-static measurements in experimental stress analysis when medium or high numbers of input channels are required. The system accepts inputs from strain gauges in all common bridge configurations, from strain gauge based transducers, from potentiometers, and from general voltage sources. It also accepts inputs from 4-bits digital signal sources.

System configuration is achieved with the special "ESAM STATIC" Software which is also used for the setup of channel parameters as well as the A/D-conversion mode, the trigger circuits, the sampling rate and the data transfer from the Host-PC via USB communication interface. These software/hardware capabilities offer significant reductions in setup time, and also drastically reduce the risks of faulty system configurations and system connections. The Software smoothly runs under Windows® XP, Windows® Vista (32 bit and 64 bit), Windows® 7 (32-bit and 64 bit), Windows® 8 (32 bit and 64 bit) and Windows® 10 (32 bit and 64 bit).

System Features:

- Signal bandwidth <50 Hz.
- Software selectable sampling rate between 0.002 and 100 Samples/s per analogue channel.
- Modern USB 2.0 interface double RAM buffer for the transfer of measurement data system commands.
- Additional RS232C port (option).
- Internal high-speed 32-bits microcontroller.
- Internal EEPROM- and FLASH-Memory Card (1GB Card optional) for storage of system setup parameters and converted data stream.
- 3 different internal trigger circuits for automatic data stream recording.
- Integrated LCD Display and keyboard for offline operation.
- Digital I/O-Port, 4 buffered lines.
- System setup and measurements parameters fully software-controlled.
- Internal insulated 24 VDC power supply.
- System drivers for Windows® XP, Windows® Vista (32 bit and 64 bit), Windows® 7 (32 bit and 64 bit), Windows® 8 (32 bit and 64 bit) and Windows® 10 (32 bit and 64 bit).
- Integrated "ESAM STATIC" High-performance Software.

Technical Specifications (Basic System Unit):

Cabinet	For 16-, 32-, 64-, and 128 channel systems with LCD-Display and front plate keyboard.
Number of Channels:	8 Analogue channels per board (up to 2, 4, 8 and 16 boards per system).
Data Acquisition:	Simultaneous data acquisition of all channels in the system.
A/D-Converter:	16-bits A/D-converter for each analogue channel; measuring range ± 2.500 VDC; programmable sampling rate 0.002 up to 100 samples per second per channel.
Averaging Digital Filter:	Averaging 1, 2, 4, or 8 samples/channel.
Interface:	USB2.0 (compatible with USB1.1) interface for data transfer and setup commands to/from PC.
Additional Interface:	RS232C interface for connecting event markers such as AT-MARK-2.
Data Storage and Data Display:	Measurement data are transferred to PC-HDD via USB interface. Measurement data are stored in SD-/MMC-Memory Card in accessible slot (option). Measurement data to be transferred from SD-/MMC Card to PC via USB-interface with ESAM Traveller Static Software. Measurement data to be read from front late LCD-display.
Trigger:	Analogue signal – rising edge (level and duration software-programmable); analogue signal – falling edge (level and duration software-programmable); analogue signal - level (level and duration software-programmable); time (year, month, hour, min., sec. for Start/Stop - software-programmable)
Power Supply:	18 to 36 VDC
Dimensions and Weight	70 mm x 302 mm x 206 mm; approx. 2,2 kg - for 16-channels cabinet 121 mm x 302 mm x 206 mm; approx. 3,5 kg - for 32- channels cabinet 202 mm x 302 mm x 206 mm; approx. 6 kg - for 64- channels cabinet Data for 128- channels cabinet on request

Strain Gauge Bridge Amplifier ETSSGA-1:

Short Description:

ETSSGA1 module is a high precision, programmable Strain Gauge Input Board for measurements using strain gauges, strain gauge based transducers, potentiometers, and other voltage sources with characteristics compatible with this Signal Conditioner / Amplifier channel.

Features of Amplifier Board Mod. ETSSGA-0:

- 8 analogue channels per board.
- Constant-voltage bridge excitation in 2.5 mV steps adjustable from 0 V to 10.20 V separately for each channel.
- Connection of strain gauge in quarter, half and full bridge circuit, strain gauge-based transducer and potentiometric transducers.
- Built-in bridge completion module for 350/120 Ω strain gauge half- and quarter bridge circuits.
- Optional: Quarter bridge completion module for Strain Gauge with 1000 Ω .
- Built-in shunt-calibration circuits with internal low-impedance switches for software-programmable configuration of adequate calibration configurations.
- Connection for HVIA adapter (input voltages up to ± 40 V) and THIA adapter (all standard thermocouple types)
- Programmable gain, individual for each channel.
- Built-in 4-pole Butterworth low-pass filter set (selectable when ordering) at 5, 10, 20 or 40 Hz (-3dB).
- Digital averaging filter, up to 8 samples used for averaging for one single measuring data for each channel on the board.
- Software-programmable electronically coarse bridge balance with possibility of automatic simultaneous balancing of all channels on the board.
- Bridge excitation, calibration and bridge balance fully software-programmable.
- Individual high-speed 16-bits A/D-converter for each analogue board.

- All functions and adjustments of the analogue channels of each board are served and controlled by a high-speed CMOS-32-bits-microcontroller (external jumpers, potentiometer, switches, or the like not required).

Technical Specifications Strain Gauge Bridge Amplifier Mod. ETSSGA-1:

Inputs to Analogue Channels:	Number of Input Channels:	8 complete bridge amplifiers per board
	Inputs:	2- to 4-wire and guard shield to accept quarter, half, or full bridge strain gauge circuits, transducer inputs, potentiometric transducer, HVIA adapter and THIA adapter. 1000 Ω internal half bridge, 350 Ω and 120 Ω completion gauges (1000 Ω - option), internal shunt calibration circuits
	Input Impedance:	100 M Ω @ 1500 pF
	Differential Input Voltage:	Max. \pm 2.5 V
	Common Mode Voltage:	\pm 2.5 V
	Input Overload Protection:	Protected against \pm 30 VDC
Gains and Measurements Ranges:	Gains:	1, 2, 4, 8,16, 20, 40, 80, 160, 320, 640, 1280, 2560 V/V
	Input Voltage Ranges:	\pm 2.5 V (for gain 1 V/V) to 0.97656 mV (for Gain 2560 V/V)
Constant Voltage Bridge Excitation:	Range:	0 to 10.20 VDC Max. in Steps of 2,5 mV; for each channel, separately adjustable
	Output Current:	Max. 40 mA per channel with overload protection
	Accuracy:	\pm 0.1 %
	Temperature Stability:	\pm 0.01 %/K
Balance:	Type:	Internal microprocessor-controlled electronically balance circuitry
	Range:	\pm 100% of measurements range with a resolution of 16 bits
Calibration:	Type:	Software controlled Shunt-calibration
	Calibration Resistors:	RC1 = 174.65 k Ω , 0.1 %, 1000 μ m/m (0.50 mV/V) for 350 Ω and gauge factor K=2.00 RC2 = 59.88 k Ω , 0.1 %, 1000 μ m/m (0.50 mV/V) for 120 Ω and gauge factor K=2.00 RC3 = 499 k Ω , 0.1 %, 1000 μ m/m (0.50 mV/V) for 1000 Ω and gauge factor K=2.00
Amplifier:	Accuracy:	\pm 0.2 %
	Non-linearity:	0.005 % of FS
	Temperature Coefficient of Zero:	\pm 1 μ V/K (Max.) for gains 20 to 2560
	Common Mode Rejection:	Gain 1: 80 dB Gain 8: 90 dB Gain 100 to 2560: 100 dB
	Hardware-Filter:	4-pole Butterworth low-pass filter set (selectable when ordering) at 5, 10, 20 or 40 Hz (-3dB).

Amplifier Mod. ETSPT-0 for Temperature Measurements

Short Description:

Mod. ETSPT0-board is an 8-channels precision amplifier for temperature measurements with Platin sensors of the PT100 type. These sensors exhibit a resistance 100 Ω at 0°C. The measuring principle of PT100 sensors is based on their change of electrical conductivity with temperature changes. These sensors are generally known as RTD's (Resistance Temperature Detector).

Mod. ETSPT0 contains an ultra-stable 100.00 Ω reference resistor and 2 identical precision current sources, one of which is the supply for the sensor, the other one for the reference resistor. The differential voltage between the two resistors then represents the measuring signal which is available at the differential output of the amplifier.

Due to the matched current sources and the 3-lead wire circuitry all voltage drops in the lead wires will compensate. The active 3-pole output filter (cut-off frequency 10 Hz) reduces 50 Hz noise.

Technical Specifications Amplifier Input Board Mod. ETSPT-0:

Number of Input Channels:	8 complete signal conditioner channels per board
Platin-Sensor Type:	PT100 (100 Ω @ 0°C) PT1000 (1000 Ω @ 0°C) optional
Constant Current Excitation:	0.2 mA
Measuring Range:	-100°C to +400°C max.
Max. Input Voltage:	-6V to +40V
Resolution:	0.013 K min.
Temperature Coefficient of Zero:	± 1 mV/K RTI
Overall Accuracy:	± 0.4 K
Low-pass Filter:	Active 3-pole-10 Hz Filter
Fine Adjustment:	Internal microcontroller adjusts 0 °C to 0.0 V.
Input Connector:	Miniature-Sub-D 9-Pin female

Amplifier Mod. ETSTH-0 for Thermocouple

Short Description:

The Signal Conditioner / Amplifier ETSTH0 is designed to perform thermocouple measurements using cold junction compensation, amplifier with selectable amplification level and strong filtering of signal to reduce 5 Hz bandwidth noise. The ETSTH0 conditioner includes an internal cold-junction compensator suitable to be used with E, J, K, T, R and S thermocouple types.

Technical Specifications Amplifier Input Board Mod. ETSTH-0:

Number of Input Channels:	8 complete signal conditioner channels per board
Thermocouple types:	E, J, K, T, R, S
Measurements ranges:	E = -100 °C to +1000 °C J = -200 °C to +760 °C K = -150 °C to +1250 °C T = -200 °C to +400 °C R = 0 °C to +1750 °C S = 0 °C to +1750 °C
Resolution:	< 0.1 °C
Input Impedance:	22 M Ω
Temperature Coefficient of Zero:	$\pm 0,1$ μ V/K RTI; 100 μ V/K RT0
Gain:	1, 2, 4, 8, 16, 32, 64, 128 V/V
Accuracy of gain:	$\pm 0,2$ % @ 25 °C
Stability of Gain:	+ 100 ppm/K
Common Mode Rejection:	100 dB for input signals 0 to 10 Hz
Filter:	4-pole Butterworth low pass filter: 5 Hz Digital averaging filter

Subject to changes and modifications without prior notice!