



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 ESAM Traveller 1



ESAM TRAVELLER 1 is a high-performance digital data acquisition system for amplifying and conditioning of analogue sensor signals. The Master Unit represents the heart of the system. In a very small cabinet it contains: The power supply, the USB-Interface with a RAM-data buffer, the A/D-Converter as well as 8 modules of Model SGA3 strain gauge bridge amplifiers. The system can easily be extended up to a 32 channels capacity by simply adding max. 3 Extension Units with 8 channels each of Model SGA3 strain gauge bridge amplifiers.

Offline measurements, without PC that is, are easily possible, because the Traveller 1 system can be optionally equipped with a non-volatile 1GB Flash Memory as well as an external marker device (ATMARK-2). This kind of configuration makes it possible to run automatic measurements without any user intervention.

The special ESAM TRAVELLER Software coming with the Traveller 1 System allows for the configuration and control of all parameters of the signal conditioner amplifier channels, the A/D-converting modes, the sampling frequency as well as the data transfer from the Host-PC via USB-Interface. This results in a significant reduction of setup times, and also greatly reduces the risks of faulty system configurations and system connections.

System Features:

- Small, compact system with extremely low power consumption
- Continuous real-time data transfer via USB 2.0 port with up to 8 MB per second
- Expandable to max. 32 channels system capacity with additional extension units
- Strain gauge bridge amplifiers for quarter-, half-, and full bridge input circuits. Built-in high-precision bridge completion resistors for 120 Ω and 350 Ω quarter bridge inputs
- Sampling rate max. 250 kS per second
- Real-time data acquisition under severe environmental conditions on Flash Memory without computer connection (MMC- or SD-Card) as an option
- ESAM Traveller-Software for complete system setup, measurement control through USB-Port, and for extensive data reduction
- Software expandable with a variety of additional software modules

Technical Specifications (Master Unit):

Cabinet:	For 8 channels Mod. SGA-3
Number of Channels:	8 Analogue channels
Data Acquisition:	Multiplexing of all channels in the system (minimized multiplex time by special technology)
A/D-Converter:	12 Bit A/D-Converter successive approximation; range ± 10 VDC; programmable sampling of 0.002 up to 250.000 Samples per second
Interface:	USB 2.0 (compatible with USB1.1) Interface for data transfer and setup commands to and from PC
Additional Interface:	Special high-speed interface for connecting extension units; Marker/Modem port for connecting ATMARK-2 Digital port with 4 independent digital lines; digital lines usable as pulse inputs
Data Storage and Data Display:	Direct data transfer to PC-HDD via USB-Interface Data storage in on-board Flash-Memory (MMC- or SD-Card) optional. Flash Memory card not user accessible. Data reading through USB port and ESAM Traveller Software
Trigger:	Analogue signal – Rising Edge (level / duration software programmable); analogue signal – falling edge (level / duration software programmable); analogue signal - level (level / duration software programmable); time (year, month, hour ,min., sec. for Start and Stop – software programmable)
Power:	10 to 18 VDC; optional 18 to 36 V
Dimensions and Weight	70 mm x 235 mm x 200 mm; 2 kg
Cabinet:	For 8 channels Mod. SGA-3

Strain Gauge Bridge Amplifier Mod. SGA-3 - Features:

- 8 channels per unit
- Constant-voltage bridge excitation
- Built-in bridge completions for 350/120 Ω strain gauge quarter- and half bridges as well as transducer input circuits
- Signal bandwidth 10 kHz at full power and all gains
- Built-in shunt-calibration circuitry with internal switches for selecting calibration configurations by user software
- Built-in fixed fester 4-pole Butterworth low-pass filter, 1, 2 or 3 kHz (-3dB) cut-off frequency (to be specified with ordering)
- High-precision, software programmable electronic bridge balance with large balance range
- Fully programmable operational functions: Bridge excitation, gain, calibration and bridge balance
- All functions of the analogue channels are served and controlled by a high-speed CMOS-Microprocessor

Technical Specifications Strain Gauge Bridge Amplifier Mod. SGA-3:

Analogue Inputs:	Number of Input Channels:	8 complete bridge amplifiers per cabinet unit; 9-pin Sub-D-connectors
	Inputs:	120 Ω , 350 Ω strain gauge quarter bridge, 50 Ω to 5000 Ω strain gauge half- and full bridge and strain gauge based transducers . 1000 Ω strain gauge quarter bridge optional. Piezo-resistive transducers for various quantities; Potentiometer transducer; high-level voltages up to 40 V through HVIA-Adaptor optional
	Input Voltage:	± 10 V
	Voltage Protection Input:	± 40 VDC
	Input Impedance:	20 M Ω , 1500 pF
Bridge Excitation:	Bridge Excitation Voltage:	Software programmable DC-bridge excitation, excitation voltage common for all 8 channels per unit
	Excitation Voltage Range:	1 V, 3 V, 4 V, 5 V, 6 V, 8 V and 10 V
	Current:	320 mA max. per cabinet unit with over current protection; 40 mA max. excitation current per channel
	Accuracy of Bridge Excitation	0.2%
	Temperature Stability of Bridge Excitation:	0.01 %/K
Bridge Balance:	Bridge Balance Type:	Electronic bridge balance by internal microprocessor
	Ranges:	
	Gain 1:	± 20.5 % FSR (full scale range)
	Gain 2:	± 41 % FSR
	Gain 4:	± 82 % FSR
	Gain 8:	± 164 % FSR
	Gain 250:	± 51 % FSR
	Gain 500:	± 102 % FSR
	Gain 1000:	± 205 % FSR
Gain 2000:	± 410 % FSR	
Calibration:	Calibration Type:	Software-controlled shunt-calibration with various possible calibration circuits
	Calibration Resistors:	RC1 = 174.65k Ω 0.1 %, 1000 $\mu\text{m/m}$ (0.50 mV/V) for 350 Ω and gauge factor K=2.00; RC2 = 59.88k Ω 0.1 %, 1000 $\mu\text{m/m}$ (0.50 mV/V) for 120 Ω and gauge factor K-Factor K=2.00
Amplifier:	Gain Steps:	1, 2, 4, 8, 250, 500, 1000, 2000
	Gain Accuracy:	± 0.2 %
	Gain Linearity:	0.02 % FSR
	Signal Bandwidth:	DC to 10 kHz (-3dB) at all gains and full output
	Noise (at 350 Ω source resistance):	< 2 mV _{eff} RTI at G =1000 and signal frequency in a range of 0.1 Hz to 10 kHz
	Temp.- Coeff. of Zero:	± 1 $\mu\text{V/K}$ max.
	Common Mode Rejection:	100 dB
	Output Range:	± 10 V, short circuit proof
	Filter:	4-pole Butterworth low-pass filter for each channel; cut-off frequency 2 kHz ($\pm 5\%$) - 3dB
Output of Analogue Channels:	± 10 V for each channel optional	

Subject to changes and modifications without prior notice!