SA 32

Analogue data acquisition module
with 8 / 32 channels in 2 or 4 wires

SA 32 analogue data acquisition system is dedicated to measurement, monitoring and recording of analogue signals on 32 channels in 2 wires or 8 channels in 4 wires.

- Voltage: 0-10 V
- Current: 0-20 and 4-20 mA with external shunts
- Thermocouples: Type K/T/J/S/B/N with or without cold junction compensation
- Resistance: 3000 Ω
- RTD: Pt100 in 3 or 4 wires
- Dry contacts

Description

SA 32 analogue data acquisition system is dedicated to measurement, monitoring and recording of analogue signals on 32 channels in 2 wires or 8 channels in 4 wires.

Designed with flexibility and precision, this system can be used in numerous applications, on site or in laboratory.

SA 32 allows 100 addresses to be programmed, which can be defined to measure real channels (up to 32 channels) or virtual channels used to perform calculations / maths functions.

Input channels are scanned by a CMOS logic circuit.

Scanning is organised in «tasks» or scanning procedures, defining what to scan (channels), how to scan (scanning start and stop, scanning rate), and how to process the results (mass storage, RS 232 output). The user has access to 16 tasks, therefore 16 different scanning subgroups.

The datalogger is completely programmable via keyboard and help menu on screen, or via RS 232 interface using LTC 32W software supplied with the unit.

Backlit LCD display shows 2 channels simultaneously either under digital or graphical format (150 points definition) on a time base adjustable between 1 s to 1 min. It also enables stored valued to be recalled on screen for display under digital or graphic format.

SA 32 perform measurement, monitoring and recording of analogue signals coming from sensors of physical or electrical values. These signals can be:

- Voltage: 0-10 V
- Current: 0-20 and 4-20 mA with external shunts
- Thermocouples: Type K/T/J/S/B/N with or without cold junction compensation
- Resistance: 3000 Ω
- RTD: Pt100 in 3 or 4 wires
- Dry contacts

Specifications

Specifications and performances in temperature @23°C ±1°C

Uncertainty is given in % of reading + fixed value.

Resistive probes: Measurement

Type	Range	Resolution 7 samples / s	Resolution 20 samples / s	Resolution 50 samples / s	Accuracy / 1 year 7 samples / s	/ 1 year 20 samples / s	/ 1 year 50 samples / s
Pt100	-220°C to +850°C	0.01°C	0.1°C	1°C	0.025% RDG + 0.1°C	0.025% RDG + 0.15°C	0.04% RDG + 0.6°C

Accuracies are given for 4-wire mounted probes
Admissible measuring current: 1 mA
Admissible line resistance: 100 Ω per wire
Temperature coefficient: < 0.003% /°C

Thermocouples: Measurement

Type	Range	Resolution 7 samples / s	Resolution 20 samples / s	Resolution 50 samples / s	Accuracy / 1 year 7 samples / s	Accuracy / 1 year 20 samples / s
K	-250 to -200°C -200 to -100°C -100 to +1370°C	0.5°C 0.2°C 0.1°C	0.5°C 0.2°C 0.1°C	1°C 1°C	0.01% RDG + 1°C 0.01% RDG + 0.4°C 0.01% RDG + 0.2°C	0.02% RDG + 1.4°C 0.02% RDG + 0.5°C 0.02% RDG + 0.3°C
T	-250 to -200°C -200 to -100°C -100 to +400°C	0.5°C 0.2°C 0.1°C	0.5°C 0.2°C 0.1°C	1°C 1°C	0.01% RDG + 0.8°C 0.01% RDG + 0.4°C 0.01% RDG + 0.2°C	0.02% RDG + 1°C 0.02% RDG + 0.5°C 0.02% RDG + 0.3°C
J	-210 to -120°C -120 to1100°C	0.2°C 0.1°C	0.2°C 0.1°C	1°C 1°C 1°C	0.01% RDG + 0.3°C 0.01% RDG + 0.2°C	0.02% RDG + 0.4°C 0.02% RDG + 0.3°C
S	-50 to +120°C	1°C 1°C	1°C 1°C	1°C 1°C	0.01% RDG + 1.2°C	0.02% RDG + 1.7°C

	+120 to +1768°C				0.01% RDG + 0.7°C	0.02% RDG + 1°C
B	+400 to +900°C +900 to +1820°C	1°C 1°C	1°C 1°C	1°C 1°C	0.01% RDG + 1.5°C 0.01% RDG + 0.8°C	0.02% RDG + 2°C 0.02% RDG + 1°C
N	-250 to -200°C -200 to -120°C -120 to +1300°C	1°C 0.2°C 0.1°C	1°C 0.2°C 0.1°C	1°C 1°C 1°C	0.01% RDG + 1.5°C 0.01% RDG + 0.6°C 0.01% RDG + 0.3°C	0.02% RDG + 2°C 0.02% RDG + 0.9°C 0.02% RDG + 0.4°C

Accuracy is given for reference @ 0°C.

When using the internal reference junction, add an additional uncertainty at 0°C of ±0.5 °C in 2-wire measurement and ±1°C in 1-wire measurement.
Input impedance: > 1000 MΩ
Measuring current: < 5 nA (typical: 300 pA)
Admissible line resistance: 100 Ω per wire
Temperature coefficient: < 10% of accuracy /°C

Specifications and performances in process @23°C ±1°C

DC voltage: Measurement

Range	Resolution 7 samples / s	Resolution 20 samples / s	Resolution 50 samples / s	Accuracy / 1 year 7 samples / s	Accuracy / 1 year 20 samples / s
60 mV	1 µV	1 µV	20 µV	0.02% RDG + 6 µV	0.02% RDG + 6 µV
600 mV	2 µV	10 µV	100 µV	0.02% RDG + 10 µV	0.02% RDG + 30 µV
6 V	20 µV	100 µV	1 mV	0.02% RDG + 0.1 mV	0.02% RDG + 0.3 mV
0-10 V	20 µV	100 µV	1 mV	0.02% RDG + 0.1 mV	0.02% RDG + 0.3 mV

Input impedance: > 1000 MΩ
Measuring current: < 5 nA (typical: 300 pA)
Acceptable maximum voltage in common mode: 50 V- or ~ peak
Acceptable maximum voltage between different inputs: 50 V- or ~ peak
Temperature coefficient: < 10% of accuracy /°C

DC current: Measurement

With or without loop supply

Range	Measuring range	Accuracy / 1 year	Accuracy / 1 year

		7 samples / s	20 samples / s
0-20 mA	0 mA to 20 mA	0.1% RDG	0.1% RDG
4-20 mA	4 mA to 20 mA	0.1% RDG	0.1% RDG

With 50 Ω external shunt

Resistance: Measurement

Range	Resolution 7 samples / s	Resolution 20 samples / s	Resolution 50 samples / s	Accuracy / 1 year 7 samples / s	Accuracy / 1 year 20 samples / s
60 Ω	1 mΩ	1 mΩ	10 mΩ	0.025% RDG + 6 mΩ	0.025% RDG + 6 mΩ
600 Ω	2 mΩ	10 mΩ	100 mΩ	0.025% RDG + 10 mΩ	0.025% RDG + 30 mΩ
3000 Ω	20 mΩ	100 mΩ	1 Ω	0.025% RDG + 0.1 Ω	0.025% RDG + 0.3 Ω

Uncertainties given for 4-wire measurement
Measuring current: 1 mA
Admissible line resistance: 100 Ω per wire

Dry contacts: Measurement

Measuring current: 1 mA
Level 0: line resistance $R0 \geq 100$ kΩ
Level 1: line resistance $R1 \leq 1$ kΩ

Relay outputs

Relay breaking capacity on resistance load: 48 V, 1 A or 30 Ω
Switching life: 5.105
Relays are triggered on alarm presence, conditional signal or command from the communication interface.

Analogue output

Range	Measuring range	Accuracy / 1 year
0-2.55 V	10 mV	10 mV

Admissible load resistance: 2.5 kΩ

Further features

Scanning rate	SA 32 offer 3 scanning frequencies, in direct connection with accuracy levels.				
		Scanning ra	Integratio	Display ca	Number

	te	n time	pacity	of counts
	7 samples / s	100 ms	780,000 points	390,000 points
	20 samples / s	20 ms	78,000 points	78,000 points
	50 samples / s	1 ms	7,800 points	7,800 points

3-wire resistance and Pt 100 ranges are measured in 2 times. Sampling rates are half of those indicated above.

Calculation channels	The embedded software is able to perform data calculations and store calculation results. Calculations can come from input channel values or conditional calculations (Data processing, statistics, conditioning, Boolean calculations). Calculation operations: +, -,/,x operators, elevation to multiple powers, timer function(s), logic operators, square root, log decimal, absolute value and statistical functions min, max, average, standard deviation Calculation channels can be used to condition outputs (relays, analogue outputs).
Alarms	Every channel can be configured with 4 alarms levels for monitoring purposes.

General specifications

Size	225 x 88 x 310mm
Weight	3 kg
Power supply	230 V ± 10 %, 50/60 Hz 115 V~ by internal commutation 12 V (11 to 28 V) 4 W
Communication ports	RS 232, MODBUS

Storage capacity	Internal of 64,000 values

Environmental specifications

Reference range	23°C ±1°C (RH: 45 to 75 % condensing)
Operating reference range	0 to 50°C (RH: 20 to 75 % condensing)
Storage temperature limits	-15°C to +50°C
Maximum height	0 to 2500 m
Sealing	IP40 according to EN60529

Safety specifications

Class	In accordance with EN 61010-1 Category III, pollution 2
Rated voltage	50 V
Chocks and vibrations	EN 61010-1
EMC conformity	Immunity: • EN 50082-1/1992 Conducted and radiated emissions: • EN 55022, class B • Radiated: IEC 801-3/1984 • Conducted: IEC 801-4/1988 • Electrostatic discharges: IEC 801-2/1991

Models and accessories

Instrument:

SA32 C58   Data acquisition system with keyboard and 64,000 memory capacity

Delivered in standard with:

- User manual
- Power cable
- CD with configuration software
- RS 232 cable

Accessories:

ER48358-000   Measurement connector interface

ER48345-004   Four pin connector

ER44007-024   50 Ω shunt for process current measurement

AN 5883   Bracket mounting for panel installation (T2 box type)

AN 5884   Rack mounting kit for rack installation (T2 box type)

AN 5876   RS232 25p printer cable

AN 6901   Case for bench top instruments

ATC061   Converter RS 232 / USB

Software:

VISULOG   Monitoring & data processing software full version – 1 licence

VISULOG-ETAL   Monitoring & data processing software full version – 1 licence

          + Calibration module

VISULOG-PHARMA Monitoring & data processing software full version – 1 licence

          + Module for advanced management of access rights, 21 CFR Part 11 compliant

VISULOG-ETAL-PHARMA   Monitoring & data processing software full version – 1 licence

          + Calibration module

          + Module for advanced management of access rights, 21 CFR Part 11 compliant

Software licences:

LIC VISU   Additional license for VISULOG

LIC VISU ETAL   Additional license for VISULOG with ETAL optional module

LIC VISU PHARMA Additional license for VISULOG with PHARMA optional module

LIC VISU ETAL PHARMA   Additional license for VISULOG with ETAL and PHARMA optional module

LIC VISULOG WEB License for VISULOG WEB

Certification:

QMC11   COFRAC certificate of calibration

With all relevant data points where the device has been tested

Packing information:

Size   225 x 88 x 310 mm

Weight   3 kg