S-DIAS Energy Measuring Module
EE 121-1

with 3 voltage inputs (0-520 V)
12 current inputs (0-2 A AC)

The S-DIAS energy measuring module is used to record power and energy, as well as mains synchronization. The voltages from the three input phases (L1, L2 and L3) are measured, as well as the mains frequency and timestamp of the zero-voltage crossings. Additionally, up to 12 currents are also recorded. The currents can be arbitrarily assigned to the phases. The voltages are connected directly, the currents however, must be connected through the output of a current transformer with 1 A rms output.

Voltage Input Specifications

Number of channels	3
Supported nominal system voltage	0-480 V AC (phase conductor voltage Lx - Ly) 0-277 V AC (star voltage Lx - N / Lx - PE)
Measurement range	0-520 V AC (phase conductor voltage Lx - Ly) 0-300 V AC (star voltage Lx - N / Lx - PE)
Measurement value	0-52.000 (10 mV/d) 0-30.000 (10 mV/d)
Frequency range	15-120 Hz
ADC resolution	16-bit (ca. 25 mV/LSB)
Scan rate	15 µs
Voltage inputs frequency measurement range	15-120 Hz with a 0.01 Hz resolution
Frequency measurement accuracy	typically 10 MHz at 400 V AC/50 Hz and sine-formed mains voltage
Zero-voltage crossing timestamp	0 to (32767 - bus cycle time) in 1 µs increments
Input filter hardware	1.5 kHz

Galvanic separation (voltage inputs to S-DIAS bus)	4000 V AC (1 min)
Base accuracy incl. calibration errors, linearity and noise at 25 °C	±0.25 % based on the nominal system voltage of 480 V AC (Lx - Ly)/277 V AC (Lx - N / Lx - PE) within the nominal system voltage range at a mains frequency of 45 to 65 Hz
Temperature drift 0-60 °C	±0.35 % based on the nominal system voltage of 480 V AC (Lx - Ly)/277 V AC (Lx - N / Lx - PE) within the nominal system voltage range at a mains frequency of 45 to 65 Hz
Total accuracy 0-60 °C	±0.60 % based on the nominal system voltage of 480 V AC (Lx - Ly)/277 V AC (Lx - N / Lx-PE) within the nominal system voltage range at a mains frequency of 45 to 65 Hz

Current Input Specifications

Number of channels	12
Supported current converters, secondary nominal current	1 A AC
Measurement range	0-2 A AC
Measurement value	0-20.000 x $I_{PRIMARY}$/$I_{SECONDARY}$ (0.1 mA/d)
Permissible overcurrent	2 A continuous 5 A for 20 s 10 A for 1 s
Frequency range	15-120 Hz
ADC resolution	16-bit (ca. 50 µA/LSB)
Scan rate	30 µs
Current shunt	60 mΩ
Input filter hardware	1.5 kHz
Galvanic separation (current inputs to S-DIAS bus)	none
Base accuracy incl. calibration errors, linearity and noise at 25 °C	±0.25 % based on the nominal current of 1 A within the nominal current range of 1 A AC at a mains frequency of 45 to 65 Hz
Temperature drift 0-60 °C	±0.40 % based on the nominal current of 1 A within the nominal current range of 1 A AC at a mains frequency of 45 to 65 Hz
Total accuracy 0-60 °C	±0.65 % based on the nominal current of 1 A within the nominal current range of 1 A AC at a mains frequency of 45 to 65 Hz

Electrical Requirements

Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	0	
Power supply on the S-Dias bus	+24 V	
Current consumption on the S-DIAS bus (+24 V supply)	typically 45 mA	maximum 60 mA

Article Number and Miscellaneous

Article number	20-068-121-1
Mechanical	25 x 104.2 x 98.3 mm (W x H x D)
Standard	UL 61010-1, CAN/CSA-C22.2
Approvals	CE, UL

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	over voltage category II, up to 5000 m over voltage category III, up to 2000 m pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

Notes