Storm-03

Multifunction electrical converter

→ **accurate measurement**
→ **fault indication**
→ **automation functions**

Multifunction converter for universal use. High accuracy and a broad range of measurement and indication functions, including custom-defined ones. Functions for special technological measurement, the ability to use modern measurement sensors. Extra communication interfaces and protocols facilitate virtually unlimited integration. Typical use is in the power and electrical engineering sectors for measuring AC quantities.

→ Basic Characteristics

- measurement of basic as well as derived electrical quantities in 3-phase 50 and 60 Hz AC grid with accuracy starting at 0.5 %
- direct and indirect measurement, optional use of measurement transformers and sensors (resistive and capacitive dividers, Rogowski coils)
- indication of faults in the electrical grid and data recording (fault recorder)
- binary inputs and outputs for monitoring and control
- the ability to add special user-defined measurement, automation and regulation functions
- communications interfaces for easy integration via standard protocols
- SW for configuration, parameter setting and diagnostics included

→ Typical Use

- measurement and indication of faults in electrical grids, buildings and equipment at all voltage levels (HV, MV and LV)
- measurement and indication of faults in supply and technological switchgear
- measurement unit with specific requirements for measurement functions for equipment monitoring (e.g. measurement of voltage on transformer bushings)
- universal converter for a wide range of uses, as an OEM unit for manufacturers, suppliers and system integrators for monitoring, control and information systems
- stand-alone measurement, automation and regulation module with user-defined functions

Communication

- support for secure communication according IEC 62351
- serial and network communication interfaces, Ethernet
- broad range of communication protocols is available
- broad range of communication parameter settings (data rate, parity, device address, network communication parameters)
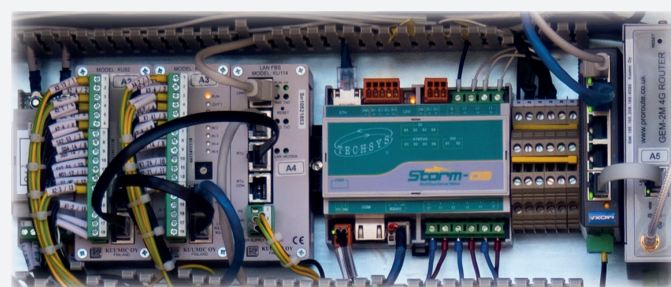
Technical Specification

AC voltage measurement	3x input
AC current measurement	3x input
Digital inputs	4x opto-element, passive input
Digital outputs	2x switching contacts relay
Communic. interface	Ethernet LAN 10/100, RS-232, RS-485
Mechanical build	6M width plastic case
Mounting	35 mm DIN rail
Protection	IP 20
Power voltage	24 V DC
Typical draw	50 mA
Operating temperature	-25 ÷ 70 °C
Max. ambient temp.	95 % non-condensing
Weight	max. 210 g
Dimensions (w × h × d)	105 × 90 × 60 mm (6 modules)
EMC emission and resistance standards	IEC 61000-6-2, IEC 61000-6-4, IEC 55022, IEC 55024

Technical Parameters of AC Voltage Measurement

U_{nom}* – nominal measured voltage (phase/line)	230/400 V AC, measuring range 120 % U_{nom}, 57,7/100V AC, measuring range 120 % U_{nom}
Accuracy	± 0,5% of range
Overload	2x U_{nom} permanently (IEC 258), 4x U_{nom} short-term 1 s
Input impedance	400 kΩ
Internal connection	star shape (Y)
Measured quantities	
U_{1N}, U_{2N}, U_{3N}	phase voltage L1 – N, L2 – N, L3 – N
U_{12}, U_{23}, U_{31}	line voltage L1 – L2, L2 – L3, L3 – L1
Galvanic separation	isolation strength 630 V long-term

/* U_{nom} range and value can be customized upon request

In the case of measurements for capacitance or resistive dividers, the voltage input can be impediently adapted to adjust the Un range according to the dividers used. The default values are in the table:

Input impedance for resistive/capacitance dividers	10MΩ
Input voltage U_n, effective value	3,6V

Technical Parameters of AC Voltage Measurement

I_{nom} – nominal measured current	1 A AC, measuring range 400 % I_{nom} 5 A AC, measuring range 400 % I_{nom}
Accuracy	± 0.5 of range
Overload	2x I_{nom} permanently 10x I_{nom} short-term 1s
Measured quantities	
I_1, I_2, I_3	phase current L1, L2, L3
Galvanic separation	isolation strength 630 V long-term

Current measuring inputs can be adapted to external measuring transformers and current sensors (Rogowski coil) with voltage output. The Un input range and impedance can be adjusted according to the sensors used. The default values are in the table:

Input impedance for resistive/capacitance dividers	10MΩ
Input voltage U_n, effective value	3,6V

Calculated quantities

Measuring range is determined by the ranges U, I.

Power	Active (P). reactive (Q). apparent (S) power
Energy	4-quadr. energy metering (A_{P+}, A_{P-}, A_{Q+}, A_{Q-})
Cos φ	Power factor
Measurement accuracy of P, Q ,S	± 1 % of range

Fault indication functions

Instantaneous Overcurrent	ANSI 50
Time Overcurrent	ANSI 51
(Neutral) Directional Overcurrent	ANSI 67. 67N

Digital Imput parameters

Organization	1 x 4, common minus
Other technical parameters can be found in the Storm-01 data sheet	

Digital Output parameters

Organization	1 x 2 DO, common point
Other technical parameters can be found in the Storm-01 data sheet	

Kommunication Protocols (by interfaces)

RS-232, RS-485	IEC 60870-5-101, Modbus (RTU)
Ethernet	IEC 60870-5-104, Modbus TCP, DNP 3.0 TCP