

ENIP-2

multifunctional measuring devices



ENIP-2 measures the parameters of a three-phase electric network at substations, power plants, industrial enterprises, and distribution power grids.

The accuracy of measurements and the performance of ENIP-2 meet the requirements of modern automatic control systems. The instrument provides measurements of all harmonic components (True RMS) and separately of basic harmonics.

The ENIP-2 can have up to five interfaces providing data transmission to automated systems using standard exchange protocols. Any interface can be used for both data transmission and device configuration and firmware upgrade.

The USB port allows you to configure and update firmware even without external power.

The input of digital signals, the output of control commands, and analog signals are provided through built-in inputs and outputs or through up to 10 external I/O modules (e.g. ENMV-1). To visualize the measurements, an ENMI display module may be connected to ENIP-2.

Modifications ENIP-2 differ from each other in the composition of interfaces and sets of inputs and outputs for discrete input-output and analog output.

Minimum

One or two RS-485 ports. The second RS-485 port can be used for a redundant data transmission channel, or for connecting external devices.



Minimum plus

A set of digital inputs, digital inputs and outputs, or analog outputs. 10 LED indicators.



Optimum

Three RS-485 ports and one 100Base-TX.



Maximum

Two RS-485 ports and two 100Base-TX/FX (RSTP, PRP).



Specification

Nominal (rated) current and voltage	1 or 5 A; 57.7/100, 230/400, 400/690 V (phase /line)
Voltage measurement accuracy	Full Scale: $\pm 0.2\%$ Readings: $\pm 0.2\%$ ($0.2U_{nom} \leq U \leq 1.5U_{nom}$), $\pm 0.75\%$ ($0.05U_{nom} \leq U < 0.2U_{nom}$)
Current measurement accuracy	Full Scale: $\pm 0.2\%$ Readings: $\pm 0.2\%$ ($0.1I_{nom} \leq I < 2I_{nom}$), $\pm 0.75\%$ ($0.02I_{nom} \leq I < 0.1I_{nom}$), $\pm 2.0\%$ ($0.01I_{nom} \leq I < 0.02I_{nom}$)
Power (active, reactive, apparent) measurement accuracy	Full Scale: $\pm 0.5\%$ Readings: $\pm 0.5\%$ ($0.2I_{nom} \leq I \leq 2I_{nom}$, $0.2U_{nom} \leq U \leq 1.5U_{nom}$)
Frequency measurement accuracy	± 10 mHz
Measurement time / update time	50 msec (sliding window) / 20 msec, configurable averaging period
Additional measured and computable parameters	cos, tg, angles (phase and average), active and reactive energy, U_0 , U_1 , U_2 , K_{2U} , K_U , I_0 , I_1 , I_2 , K_{2I} , K_I , THD
Digital signals	up to 32 processed signals: statuses of built-in digital inputs and outputs, statuses of inputs and outputs of external ENMV-1 modules, logical expressions, GOOSE subscriptions, diagnostic signals
Digital inputs	0, 4 or 8 inputs (wet or dry contact, debounce filtering), U_{nom} / U_{max} : 24/250 VDC, 110/150 VDC, 220/250 VDC
Digital outputs	0 or 3 outputs: 300 VDC/250 VAC, 0.1 A
Logical expressions	up to 32 expressions in 32 functions (AND, OR, CMP, TIMER, VALID)
Analog outputs	4 customized outputs, signal range: ± 5 mA, ± 20 mA, ± 24 mA, 0...5 mA, 0...20 mA, 0...24 mA, 4...20 mA
Event logging	I/O history, event log
Extension modules	display modules: ENMI-3, ENMI-4m, ENMI-4e, ENMI-7; digital inputs/outputs (up to 10 modules): ENMV-1, ITS2
Interfaces and protocols	1, 2 or 3 \times RS-485 (600...115200 baud): Modbus RTU, IEC 60870-5-101; USB; 1 or 2 \times 100Base-TX, 2 \times 100Base-FX LC MM; IEC 61850 (ed. 2), IEC 60870-5-104, IEC 60870-5-101 (UDP), Modbus TCP, Modbus RTU, SNMP, web-console, RS-485 tunneling via TCP/IP; PRP, RSTP for 2 Ethernet ports modifications
Real-time clock	500 μ s (error less than 5 s per day without sync); Time sync: IEC 60870-5-101, IEC 60870-5-104, SNTP
Power supply	18...36 VDC, 40...160 VDC, 120...370 VDC or 100...265 VAC (45...55 Hz), up to 13 VA (19 VA with ENMI)
Operating conditions	-40...+70 $^{\circ}$ C
Design	75 \times 100 \times 110 mm (IP40)
Mounting	DIN-rail TH35 mounting

Certification

Conformance to IEC 61850 – UCAiug Level A Certificate IEC 61850 Ed.1, Ed.2 (DNV GL)

Conformance to LVS EN 61010-1:2011 (EN 61010-1:2010),
EN 61000-4-3, EN 61000-4-4, EN 61000-4-5,
EN 61000-4-6, EN 61000-4-8, EN 61000-4-11.

Ordering Information

ENIP-2-4 

Interfaces and analog outputs (AO)

A2E0-41	– 2 × RS-485, 4 × AO
A3E4-41	– 3 × RS-485, 1 × 100Base-TX, 4 × AO
A2E4x2-41	– 2 × RS-485, 2 × 100Base-TX, 4 × AO
A2E4x2FX-41	– 2 × RS-485, 2 × 100Base-FX MM, 4 × AO
A2E4x2FS-41	– 2 × RS-485, 2 × 100Base-FX SM, 4 × AO

Rated current

1	– 1 A
5	– 5 A

Rated voltage

100	– 57.7 (100) V
400	– 230 (400) V
690	– 400 (690) V

Power supply voltage

220	– 120...370 VDC or 100...265 VAC
110	– 40...160 VDC
24	– 18...36 VDC

Digital inputs operating voltage

(220)	– 220 VDC
(110)	– 110 VDC
if not specified	– 24 VDC or without inputs

Interfaces, digital inputs (DI), digital outputs (DO)

A1E0-01	– 1 × RS-485
A2E0-01	– 2 × RS-485
A2E0-11	– 2 × RS-485, 4 × DI, 3 × DO
A2E0-21	– 2 × RS-485, 8 × DI
A3E4-11	– 3 × RS-485, 1 × 100Base-TX, 4 × DI, 3 × DO
A3E4-21	– 3 × RS-485, 1 × 100Base-TX, 8 × DI
A2E4x2-11	– 2 × RS-485, 2 × 100Base-TX, 4 × DI, 3 × DO
A2E4x2-21	– 2 × RS-485, 2 × 100Base-TX, 8 × DI
A2E4x2FX-11	– 2 × RS-485, 2 × 100Base-FX MM, 4 × DI, 3 × DO
A2E4x2FX-21	– 2 × RS-485, 2 × 100Base-FX MM, 8 × DI
A2E4x2FS-11	– 2 × RS-485, 2 × 100Base-FX SM, 4 × DI, 3 × DO
A2E4x2FS-21	– 2 × RS-485, 2 × 100Base-FX SM, 8 × DI

Options and accessories

IEC 61850-8-1 activation – [ES61850.enip](#)

RS-485 splitter – [EX...](#)

Surge protection devices for RS-485 – [ESP485-...](#)

Surge protection devices for Ethernet – [ESP-LAN](#)

Sealing cover – [PC1015](#)

USB 2.0 cable, male A to male B, 1 m – [USB-A-B](#)



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