



# ENCS-3m

# ENCM-3

remote terminal units



ENCS-3m and ENCM-3 remote terminal units (RTUs) provide a data communication channel between power facilities and control centers.

ENCM-3 is equipped with four interfaces, digital and analog inputs and outputs, and is used for automation of 6-20 kV substations and switchgear in distribution networks.

ENCS-3m are equipped with up to 14 interfaces and are used in automation systems of power plants and substations.

The RTUs function in real-time, acquiring data from up to 240 devices via RS-485, RS-232, and Ethernet interfaces. Collected data is aggregated and transmitted to automation systems with minimal delays.

The RTUs can be configured to perform logic operations and arithmetic calculations with the values collected.

Multiple proprietary and standard communication protocols are supported, including IEC 61850-8-1 (client/server, MMS/GOOSE). The RTUs act as protocol converters, and by demand can tunnel serial interfaces, providing direct access to devices connected to their RS-232/485 ports.

Modifications with a built-in GPS/GLONASS receiver and a 3G/2G module are available.

## ENCM-3

Remote terminal unit is equipped with three serial ports and one Ethernet port.

ENCM-3 supports data transmission in cellular networks and receives GPS/GLONASS signals.



## ENCS-3m-...-1, ENCS-3m-...-2

Remote terminal unit has ten asynchronous serial ports, and two or four Ethernet ports. This modification is distinguished by the presence of a CAN, which is used for the “warm” standby mode. It can be ordered with options: G – 4G/3G/2G module, GT – ... + GPS/GLONASS module.



## ENCS-3m-...-3, ENCS-3m-...-4, ENCS-3m-...-5

Remote terminal unit has ten asynchronous serial ports, and four Ethernet ports supporting RSTP and PRP redundancy in accordance with IEC 62439-3.



## Specification

	<b>ENCM-3</b>	<b>ENCS-3m...-1(2)</b>	<b>ENCS-3m...-3</b>	<b>ENCS-3m...-4(5)</b>
Interfaces	2(3) × RS-485, 1(0) × RS-232, 1 × 100Base-TX	6(8) × RS-485, 4(2) × RS-232, 2 × 100Base-TX (PRP, RSTP), CAN	8 × RS-485, 2 × RS-232, 4 × 100Base-TX (PRP, RSTP)	8 × RS-485, 2 × RS-232, 2 × 100Base-TX, 2 × 100Base-FX SM(MM) (PRP, RSTP)
Cellular and built-in GPS-receiver	3G, 1 sim (option G) 4G, 2 sim (option GT option T	3G (option G) option GT	n/a	n/a
Data polling	up to 64 devices	up to 240 devices	up to 240 devices	up to 240 devices
	up to 8192 measurement values, 4096 digital signals, 2048 commands			
	IEC 61850-8-1 (MMS, GOOSE), IEC 60870-5-101/103/104, DNP 3.0, Modbus RTU, Modbus TCP, SNMP; ENIP-2, ENMV-1, EMAX/TMAX, SE NSX, Sepam, SPA-Bus, DLMS/COSEM			
Upstream exchange	up to 14 connections Ethernet and 4G/3G/2G: IEC 60870-5-104, IEC 61850 (MMS, GOOSE), Modbus TCP, SNMP	up to 16 connections Ethernet and 3G/2G: IEC 60870-5-104, IEC 61850 (MMS, GOOSE), Modbus TCP, SNMP	up to 16 connections Ethernet: IEC 60870-5-104, IEC 61850 (MMS, GOOSE), Modbus TCP, SNMP	
	up to 3 connections RS-485, RS-232: IEC 60870-5-101, Modbus RTU	up to 10 connections RS-485, RS-232: IEC 60870-5-101, Modbus RTU		
Built-in inputs and outputs	see table below	n/a	n/a	n/a
Time sync	according to IEC 60870-5-101, IEC 60870-5-104, SNTP (client and server)			
Power supply	10(18)...36 VDC, 55...176 VDC, 120...370 VDC, 100...265 VAC (45...55 Hz), 13 VA Power buffer – optional	18...36 VDC, 42...176 VDC, 120...370 VDC or 100...265 VAC (45...55 Hz), 10 VA	18...36 VDC, 40...160 VDC, 120...370 VDC or 100...265 VAC (45...55 Hz), 10 VA	18...36 VDC, 40...160 VDC, 120...370 VDC or 100...265 VAC (45...55 Hz), 10 VA
Design	75 × 70 × 110 (119) mm, 75 × 100 × 110 (119) mm, 75 × 170 × 110 (119) mm	75(83) × 100 × 110 mm	75 × 100 × 110 mm	75 × 100 × 110 mm

### ENCM-3-...-

#### Inputs and outputs

	<b>000</b>	<b>400</b>	<b>421</b>	<b>422</b>	<b>430</b>	<b>640</b>	<b>800</b>	<b>612</b>	<b>1242</b>
DI dry/wet contact (24 VDC)	-	4	4	4	4	6	8	6	12
DO EMR 6 A (250 VAC), 3/0.35/0.2 A (30/110/220 VDC)	-	-	2	2	3	-	-	-	-
DO SSR 0.1 A (300 VDC/250 VAC)	-	-	-	-	-	4	-	-	-
DO EMR 8 A (250 VAC), 8/0.25 A (30/220 VDC)	-	-	-	-	-	-	-	-	3
AI ±20 mA or AI 0...20 mA	-	-	1	2	-	-	-	-	-
input for NTC resistance sensors 10 kOhm	-	-	-	-	-	-	-	1	1
PWM output (24 VDC, 250 W) for engine control	-	-	-	-	-	-	-	1	1

## Certification

ENCS-3m: conformance to IEC 61850 – UCAiug Level A Certificate IEC 61850 Ed.2 (DNV GL)

## Ordering Information

**ENCS-3m-**  -

### Power supply voltage

24 – 18...36 VDC  
 110 – 42...160 VDC  
 220 – 120...370 VDC or 100...265 VAC

### Interfaces

1 – 6 × RS-485, 4 × RS-232, 2 × 100Base-TX  
 2 – 8 × RS-485, 2 × RS-232, 2 × 100Base-TX  
 3 – 8 × RS-485, 2 × RS-232, 4 × 100Base-TX  
 4 – 8 × RS-485, 2 × RS-232, 2 × 100Base-TX, 2 × 100Base-FX SM  
 5 – 8 × RS-485, 2 × RS-232, 2 × 100Base-TX, 2 × 100Base-FX MM

### ENCS-3m-...-1(2) optional:

G – 3G/2G  
 GT – 3G/2G, GPS/GLONASS

**ENCM-3-**  -   -

### Power supply voltage

220 – 120...370 VDC or 100...265 VAC  
 110 – 55...176 VDC  
 24 – 10...36 VDC

### Interfaces

A2B1E1 – 2 × RS-485, 1 × RS-232, 1 × 100Base-TX  
 A3E1 – 3 × RS-485, 1 × 100Base-TX

### Optional

-- NA  
 G – 3G, 1 sim  
 T – GPS/GLONASS  
 GT – 4G, 2 sim, GPS/GLONASS

### Inputs and outputs

000 – NA  
 400 – 4 × DI dry contact  
 800 – 8 × DI dry contact  
 430 – 4 × DI dry contact, 3 × DO EMR  
 640 – 6 × DI wet contact (24 VDC), 4 × DO SSR  
 421 – 4 × DI dry contact, 2 × DO EMR, 1 × AI ±20 mA  
 422 – 4 × DI dry contact, 2 × DO EMR, 2 × AI 0...20 mA  
 612 – 6 × DI wet contact (24 VDC), 1 × AI NTC kOhm, PWM (24 VDC, 250 W)  
 1242 – 12 × DI wet/dry contact (24 VDC, 3 × DO EMR, 1 × AI NTC kOhm, PWM (24 VDC, 250 W)

### Designations:

Modifications ENCM-3-...-612, -1242 are available only with power supply 24 VDC (18...36 VDC),  
 DI – digital inputs, AI – analog inputs,  
 DO EMR – digital outputs 250 VAC 6 A, 30/110/220 VDC 3/0.35/0.2 A,  
 DO SSR – digital outputs 300 VDC 0.1 A,  
 AI NTC – input for NTC resistance sensors 10 kOhm,  
 PWM – PWM output (24 VDC, 250 W) for engine control

## Accessories

RS-485 splitter – EX...  
 Surge protection devices for RS-485 – ESP485-...  
 Surge protection devices for Ethernet – ESP-LAN  
 Outdoor GPS/GLONASS antenna – GPS-P  
 Mounting brackets for GPS/GLONASS antenna – GPS-KP-...  
 4G/3G/2G antenna – 4G...

## Options

IEC 61850-8-1 activation for ENCS-3m – ES61850.encs3  
 IEC 61850-8-1 activation for ENCM-3 – ES61850.encm3



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