
Time sync module

ENCS-2

Manual

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Introduction

The Manual describes information about functions, recommendations for use, technical support, maintenance, packing, transportation, storage, as well as connection diagrams to digital interfaces.

Read this manual carefully before using the device.

Typical users

Engineers, personnel who refers with setting, operations and maintenance.

Validity range

This manual applies to all ENCS-2 modification.

Support

For questions about devices, please contact with technical support «Engineering center «Energoservice»:

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ATTENTION:

- Use ENCS-2 only according to this manual;
- ENCS-2 should be installed, operated and maintained only by qualified personnel;
- Do not use any cleanser except recommended by manufacturer;
- Save ENCS-2 from impact;
- Before connecting ENCS -2, you must ensure that the local power supply conditions agree with the specifications on the label on the ENCS -2.



NOTICE:

- The information contained in this document is subject to change without notice;
- New features may be added to devices without notice.

Glossary

- GLONASS – Global Navigation Satellite System;
- GPS – Global Positioning System;
- IRIG-A, IRIG-B – (Inter-range instrumentation group) – time sync protocol according to IEEE C37.118.
- LAN – local area network;
- PC – personal computer;
- PPS – pulse per seconds;
- PTP, PTPv2 – Precision Time Protocol;
- SNTP – simple network time protocol;
- UTC – Coordinated Universal Time.

1 General information

ENCS-2 receives GPS signals to synchronize remote terminal units, transducers, servers using standard protocols (NMEA 0183, IRIG-A, SNTP, IEC 60870-101/104). This device acquires time signals from satellite navigation systems using antenna, which must be located on the southern hemisphere building side, preferably in the highest point of the building. Antenna is mounted using special bracket, which is supplied on order.

Transmission the time and date occur via serial interfaces RS-232, RS-485 and LAN.

Configuring is carried out by software «ENCS Configurator» ([download](#)).

ENCS-2 is multifunctional, repairable, restorable device. It designed for continuous operation in industrial installations.

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2 Design, naming convention, dimension

ENCS-2 has plastic housing for 35-mm DIN-rail mounting.



Figure 2.1. ENCS-2 front side.

At front side of ENCS-2 there is a label with QR code (link to device web page), serial number, manufacture date, OLED display, control buttons, ports label.

On a top label you can find detailed information about device modification, power supply, default IP address, MAC, availability of PTPv2 protocol support and other options.

Naming convention:

ENCS-2-X.1.1-A2B1E2

Power supply voltage

- 220 – 100–265 V AC (45–55 Hz) or 120–370 V DC
- 110DC – 42–176 V DC
- 24 – 18–36 V DC

Dimensions of ENCS-2 see in Fig. 2.2.

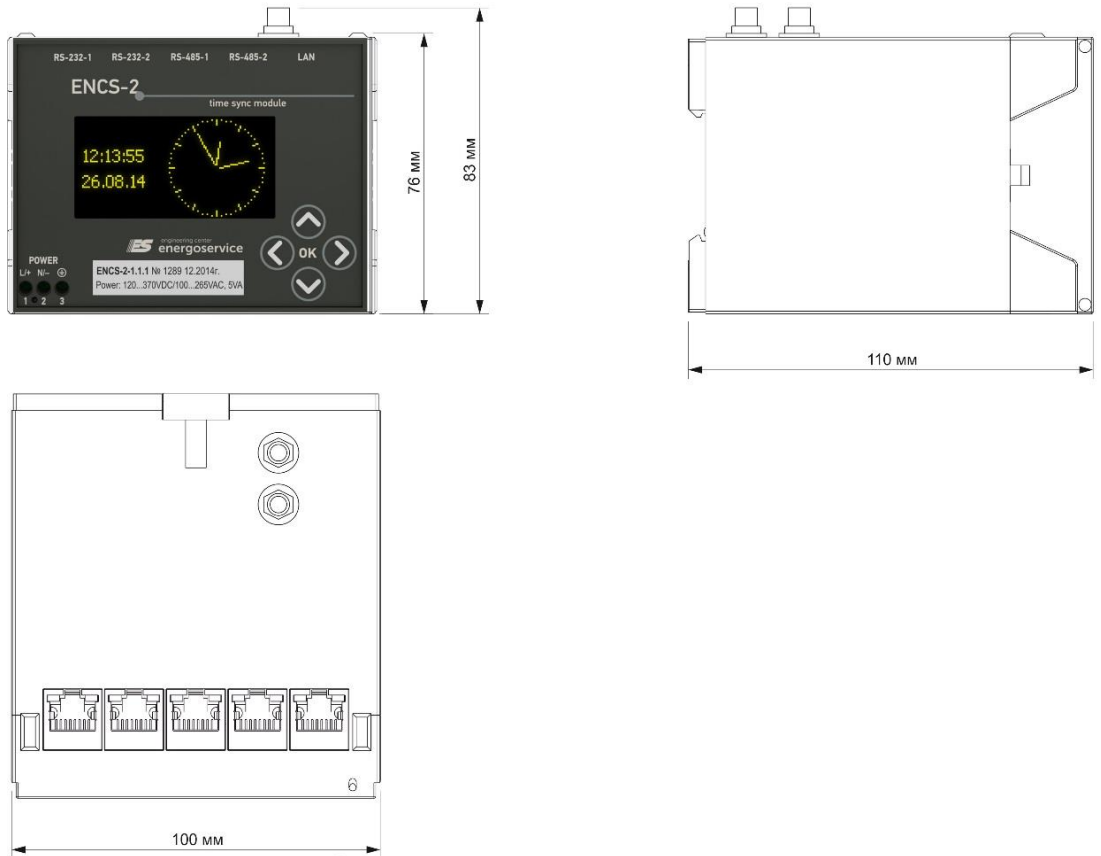


Figure 2.2. Dimension of ENCS-2 (in mm).

3 Specification

3.1 Technical data

Table 3.1. Time sync accuracy

Source	Accuracy
PPS	$\pm 0.5 \mu\text{s}$
IRIG-A, IRIG-B	$\pm 0.5 \mu\text{s}$
SNTP	$\pm 1000 \mu\text{s}$ (1 ms)
PTPv2	$\pm 1 \mu\text{s}$

Time can be adjusted in increments of 11 nanoseconds.

Without satellites signal ENCS-2 has error ± 0.4 seconds per day.

Table 3.2

Parameter	Value
Antenna type	Bullet GPS/GG 3.3 V (TNC connector)
Interfaces/protocols	RS-232-1, RS-485-1: NMEA 0183, IEC 60870-5-101; RS-485-2: IRIG-A, IRIG-B, PPS; Ethernet 100Base-Tx: SNTP; PTPv2 (optional); IEC 60870-5-104 (only for read/write settings).
Time between synchronizations	C_CS_NA_1 (103) 1...45 minutes; IRIG-A – 100 ms; IRIG-B – 1000 ms; SNTP – on request; PTPv2 – setting value (0.125 c – 16 c).
Dimension, WHD	100x83x110
Mounting	35-mm DIN-rail
Temperature range, °C	-40...+55
Non-condensing humidity, %	5-95
Atmospheric pressure, kPa	70-106
Operation mode	continuous
Turn-on time	<30 sec
MTBF	35000 h
Device life	15 year

3.2 Power supply


Power is supplied to the screw terminals. Necessary to have protective earth conductor, which is connected to the terminal next to the power terminals and marked .

Table 3.3

Modification	Voltage	Consumption
ENCS-2-220.1.1-A2B1E2	120...370 V DC; 100...265 V AC, 45...55 Hz	5 VA
ENCS-2-110DC.1.1-A2B1E2	42...176 V DC	
ENCS-2-24.1.1-A2B1E2	18...36 V DC	

4 Package content

Time sync module ENCS-2	-1
Antenna with cable (15 m or 50 m). ENCS.681730.001.012	-1
ENCS-2. ENCS.681730.001 PC	-1
CD with Manual ENCS-2. ENCS.681730.001 and software: «SyncTimeENCS», «ENCS Configurator»	-1

All documentation and software update see on <http://www.enip2.com/support>

5 Operation

5.1 Before performing installation

After receiving ENCS-2 from manufacturer, make sure that packing has no defects.

Unpacking ENCS-2, check the package contents.

Compare characteristics in passport with label on front side of device.

ENCS-2 operation should be as manual only.

Before connect/disconnect ENCS-2 to digital interfaces make sure that all sources of power supply are disconnected.

Connection ENCS-2 to RTU (or SCADA) is provided according to manual of RTU (SCADA).

Do not use ENCS in explosive or corrosive environment.

Save ENCS from heating above 70 °C, large temperature variations and strong electromagnetic fields.

5.2 Mounting

For safety, you must read the instructions in this manual before performing mounting and operation. Only qualified personnel should be allowed for mounting.

ENCS-2 is mounted on 35-mm DIN-rail.

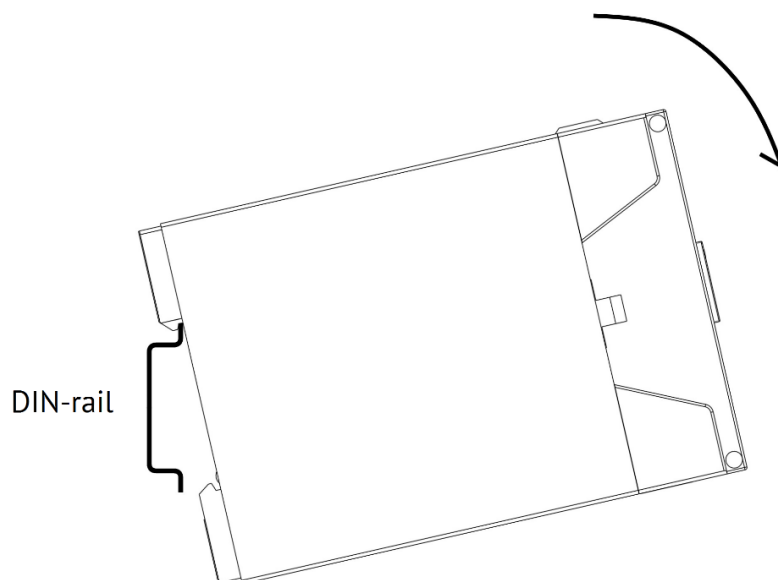


Figure 5.1. ENCS-2 installation to 35-mm DIN-rail

Pull down the clip in bottom to remove ENCS-2 from DIN-rail.

5.3 Connection

ENCS-2 has several types of interfaces, full list see in table 2.2. Recommendation on organization of networks and power supply follows:

Table 5.1

	TIA/EIA-485	TIA/EIA-232	Power supply
Max wire gauge	0.5-0.6 mm ² (24 AWG)	0.5-0.6 mm ² (24 AWG)	2.5 mm ² (12 AWG)
Max length, m	1200	15	-
Type of cable	shielded patch cord Cat5 cables «twisted pair»	shielded patch cord Cat5 cables «twisted pair»	



Notice: Use surge protection devices for digital interfaces. For example, ESP-485-X and etc.

Terminals and connectors list see in Fig. 5.1 and tables 5.2, 5.3.

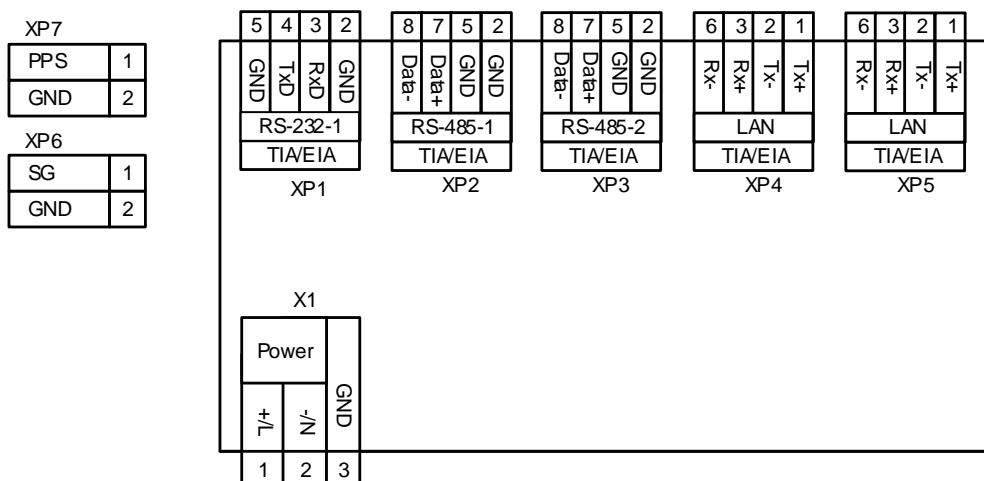


Figure 5.1. ENCS-2 connections.

Table 5.2

Symbol	Interface	Connector
XP1	RS-232-1	RJ-45
XP2	RS-485-1	RJ-45
XP3	RS-485-2	RJ-45
XP4	LAN 1 (Ethernet)	RJ-45
XP5	LAN 2 (Ethernet)	RJ-45
XP6	Antenna	SMA
XP7	PPS output	SMA
X1	Power supply	Terminals

Table 5.3. Pinout

RJ-45	RS-485	RS-232	Ethernet
1			Tx+
2			Tx-
3		Rx	Rx+
4		Tx	
5	Gnd	Gnd	
6			Rx-
7	Data+		
8	Data-		

Installation Guidelines:

To protect the antenna’s input use:

- lightning protection for SMA connectors DGA G SMA (DEHN);
- ESP-GN.

After switching on the navigation receiver collects information about satellites and synchronizes the internal clock on the received signals of satellites. In unfavorable conditions for receiving the signal (depending on the position of the satellites), this process can take up to 170 seconds. The software performs the adjustment of clock only after a full receiver synchronization. The accuracy and quality of the navigation receiver depends on the number of satellites, while being in line of sight of the antenna. Therefore, the antenna must be placed outside the building, on the roof level. Fitting Position necessarily be at long distances from objects that reflect the signals from the satellites (extended metal surfaces, etc.). In addition, for reasons of lightning protection, the antenna should not be installed above placed on the roof of earthed metal structures - antenna masts, chimneys, etc.

6 Configuring

Basic setup of time correction module is carried out via five buttons located at the bottom right of the front panel (Fig. 6.1).



Figure 6.1. Control buttons.

To switch between the categories, use the buttons: “Up”, “Down”. To display the contents of a category, use the “OK” button. To exit a category to a list of categories, use the “Left” button.

Default password for «Setting» is 112.

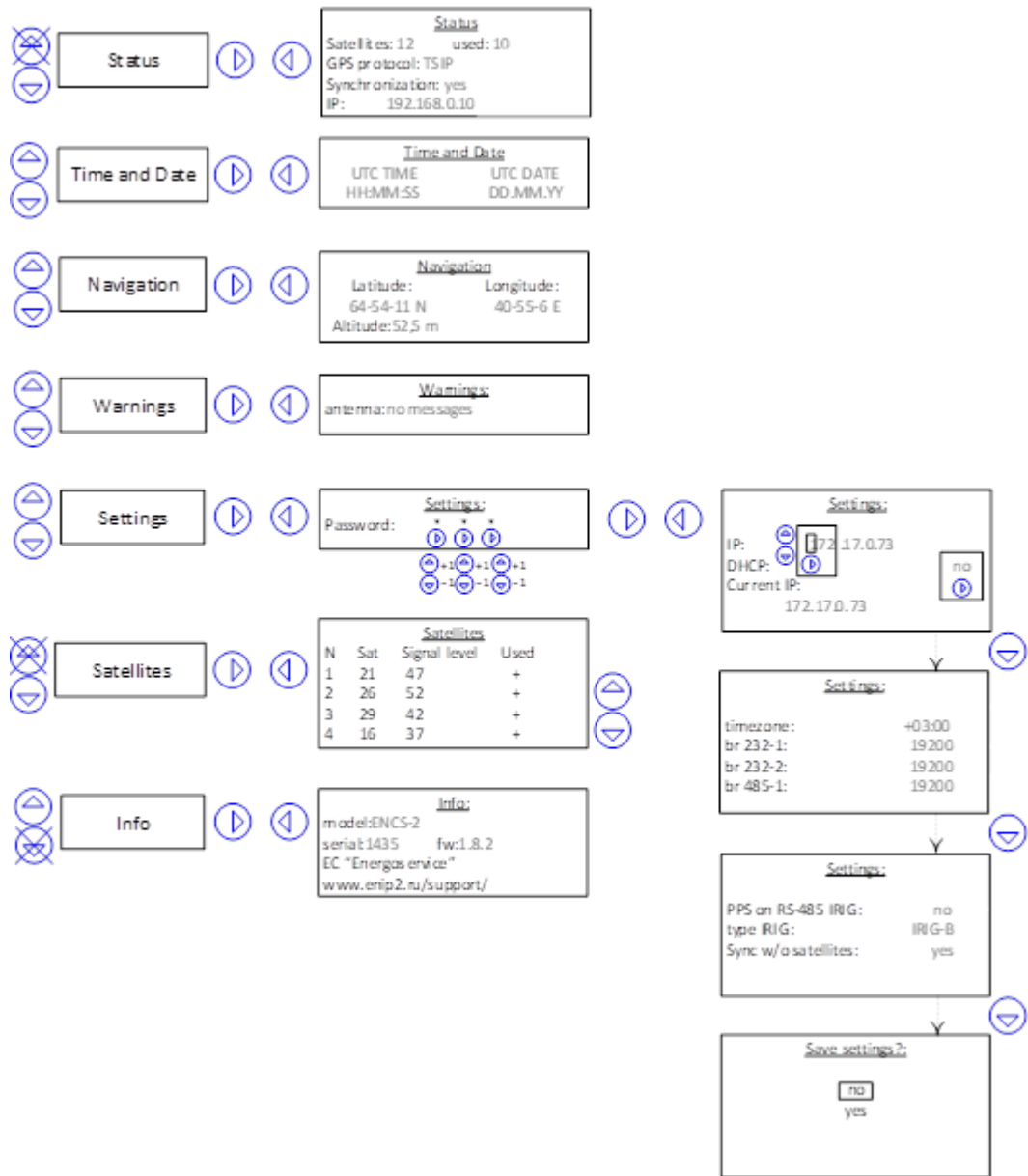


Figure 6.2. Structural scheme of display settings.

Full set of settings see in software «ENCS Configurator».

7 Maintenance

Maintenance should be according to this manual. Only qualified personnel should perform it.

Repair of defective device produced by manufacturer. Do not open the housing during operation. Opening the ENCS-2 voids the warranty.

For preventive maintenance, follow instruction bellow:

- Disconnect power supply, digital interface, measuring inputs;
- Remove dust;
- Check device for defects;
- Check mount;
- Connect power supply, digital interface, measuring inputs.

For cleaning use non abrasive detergent or 70% ethanol-water solution.

8 Transporting and package

ENCS-2 is transported in any covered transport (railway, car, aviation). Transports conditions temperature is $-50...+70^{\circ}\text{C}$, relative humidity is 95 % at 30°C . Save ENCS-2 from impact during the transport.

Net weight – up to 0.5 kg.

Gross weight – up to 0.6 kg.

Appendix A. NMEA 0183 description.

ENCS-2 supports the following NMEA-messages:

RMC – NMEA has its own version of essential gps pvt (position, velocity, time) data. It is called RMC, The Recommended Minimum:

`$GPRMC,hhmmss.ss,A,GGMM.MM,P,gggmm.mm,J,v.v,b.b,ddmmyy,x.x,n,m*CC<CR><LF>`

Symbols	Description
\$GPRMC	RMC head.
hhmmss.ss	UTC time
A	Status. «A» – active, «V» - void.
GGMM.MM,P	Latitude. «GG» - deg, «MM.MM» - min, «P» - «N» - north, «S» south.
gggmm.mm,J	Longitude. «GG» - deg, «MM.MM» - min, «P» - «E» - east, «W» west
v.v	Speed over the ground in knots
b.b	Track angle in degrees
ddmmyy	Date
x.x,n,m	Magnetic variation
*CC	Checksum data
<CR><LF>	Ends the message

ZDA (Data and Time):

`$GPZDA,hhmmss.ss,dd,mm,yyyy,xx,yy*CC<CR><LF>`

Обозначение	Описание
\$GPZDA	ZDA head
Hhmmss.ss	UTC time
dd,mm,yyy	Date
xx	Local zone hours -13..13.
yy	Local zone minutes 0..59.
*CC	Checksum
<CR><LF>	Ends the message

Appendix B. IEC 60870-5-101/ IEC 60870-5-104.

IEC 60870-5-101/104 Protocol Implementation Conformance Statement

This companion standard presents sets of parameters and alternatives from which subsets have to be selected to implement particular telecontrol systems. Certain parameter values, such as the number of octets in the COMMON ADDRESS of ASDUs represent mutually exclusive alternatives. This means that only one value of the defined parameters is admitted per system. Other parameters, such as the listed set of different process information in command and in monitor direction allow the specification of the complete set or subsets, as appropriate for given applications. This Clause summarizes the parameters of the previous Clauses to facilitate a suitable selection for a specific application. If a system is composed of equipment stemming from different manufacturers, it is necessary that all partners agree on the selected parameters.

Designation:

- Function or ASDU is not used;
- Function or ASDU is used as standardized (default);
- R - Function or ASDU is used in reverse mode;
- B - Function or ASDU is used in standard and reverse mode/

The possible selection (blank, X, R, or B) is specified for each specific Clause or parameter.

1. System or device

(system-specific parameter, indicate the definition of a system or a device by marking one of the following with an «X»)

IEC 60870-5-101	IEC 60870-5-104
<input type="checkbox"/> System definition	<input type="checkbox"/> System definition
<input checked="" type="checkbox"/> Controlling station definition (master)	<input type="checkbox"/> Controlling station definition (master)
<input type="checkbox"/> Controlled station definition (slave)	<input type="checkbox"/> Controlled station definition (slave)

2. Network configuration

IEC 60870-5-101	
<input checked="" type="checkbox"/> Point-to-point	<input type="checkbox"/> Multipoint-partyline
<input checked="" type="checkbox"/> Multiple point-to-point	<input type="checkbox"/> Multipoint-star

IEC 60870-5-104			
<input checked="" type="checkbox"/>	Point to point	<input checked="" type="checkbox"/>	Multipoint partyline
<input checked="" type="checkbox"/>	Multiple point-to-point	<input checked="" type="checkbox"/>	Multipoint-star

3. Physical layer

(network-specific parameter, all interfaces and data rates that are used are to be marked with an «X»)

Transmission speed (control direction)

IEC 60870-5-101		
Unbalanced interchange circuit V.24/V.28 Standard	Unbalanced interchange circuit V.24/V.28 recommended if >1200 bit/s	Balanced interchange circuit X.24/X.27
<input type="checkbox"/> 100bit/s	<input checked="" type="checkbox"/> 2400bit/s	<input type="checkbox"/> 2400bit/s
<input type="checkbox"/> 200bit/s	<input checked="" type="checkbox"/> 4800bit/s	<input type="checkbox"/> 4800bit/s
<input type="checkbox"/> 300bit/s	<input checked="" type="checkbox"/> 9600bit/s	<input type="checkbox"/> 9600bit/s
<input type="checkbox"/> 600bit/s	<input checked="" type="checkbox"/> 19200bit/s	<input type="checkbox"/> 19200bit/s
<input type="checkbox"/> 1200bit/s	<input type="checkbox"/> 38400 bit/s	<input type="checkbox"/> 38400bit/s
	<input type="checkbox"/> 57600 bit/s	<input type="checkbox"/> 56000bit/s
	<input checked="" type="checkbox"/> 115200 bit/s	<input type="checkbox"/> 64000bit/s

IEC 60870-5-104			
Unbalanced interchange circuit V.24/V.28 Standard	Unbalanced interchange circuit V.24/V.28 recommended if >1200 bit/s	Balanced interchange circuit X.24/X.27	
<input checked="" type="checkbox"/> 100bit/s	<input checked="" type="checkbox"/> 2400bit/s	<input checked="" type="checkbox"/> 2400bit/s	<input checked="" type="checkbox"/> 38400bit/s
<input checked="" type="checkbox"/> 200bit/s	<input checked="" type="checkbox"/> 4800bit/s	<input checked="" type="checkbox"/> 4800bit/s	<input checked="" type="checkbox"/> 56000bit/s
<input checked="" type="checkbox"/> 300bit/s	<input checked="" type="checkbox"/> 9600bit/s	<input checked="" type="checkbox"/> 9600bit/s	<input checked="" type="checkbox"/> 64000bit/s
<input checked="" type="checkbox"/> 600bit/s		<input checked="" type="checkbox"/> 19200bit/s	
<input checked="" type="checkbox"/> 1200bit/s			

Transmission speed (monitor direction)

IEC 60870-5-101		
Unbalanced interchange circuit V.24/V.28 Standard	Unbalanced interchange circuit V.24/V.28 recommended if >1200 bit/s	Balanced interchange circuit X.24/X.27
<input type="checkbox"/> 100bit/s	<input checked="" type="checkbox"/> 2400bit/s	<input type="checkbox"/> 2400bit/s
<input type="checkbox"/> 200bit/s	<input checked="" type="checkbox"/> 4800bit/s	<input type="checkbox"/> 4800bit/s
<input type="checkbox"/> 300bit/s	<input checked="" type="checkbox"/> 9600bit/s	<input type="checkbox"/> 9600bit/s
<input type="checkbox"/> 600bit/s	<input checked="" type="checkbox"/> 19200bit/s	<input type="checkbox"/> 19200bit/s
<input type="checkbox"/> 1200bit/s	<input type="checkbox"/> 38400 bit/s	<input type="checkbox"/> 38400bit/s
	<input type="checkbox"/> 57600 bit/s	<input type="checkbox"/> 56000bit/s
	<input checked="" type="checkbox"/> 115200 bit/s	<input type="checkbox"/> 64000bit/s

IEC 60870-5-104		
Unbalanced interchange circuit V.24/V.28 Standard	Unbalanced interchange circuit V.24/V.28 recommended if >1200 bit/s	Balanced interchange circuit X.24/X.27

■ 100bit/s	■ 2400bit/s	■ 2400bit/s	■ 38400bit/s
■ 200bit/s	■ 4800bit/s	■ 4800bit/s	■ 56000bit/s
■ 300bit/s	■ 9600bit/s	■ 9600bit/s	■ 64000bit/s
■ 600bit/s		■ 19200bit/s	
■ 1200bit/s			

4. Link layer

Network-specific parameter, all options that are used are to be marked with an “x”. Specify the maximum frame length. If a non-standard assignment of class 2 messages is implemented for unbalanced transmission, indicate the type ID and COT of all messages assigned to class 2.

IEC 60870-5-101

Frame format FT 1.2, single character 1 and the fixed time out interval are used exclusively in this companion standard.

Link transmission procedure	Address field of the link
<input type="checkbox"/> Balanced transmission	<input type="checkbox"/> Not present (balanced transmission only) <input checked="" type="checkbox"/> One octet <input type="checkbox"/> Two octets <input type="checkbox"/> Structured <input checked="" type="checkbox"/> Unstructured
<input checked="" type="checkbox"/> Unbalanced transmission	
Frame length	
255 Maximum length L (control direction)	
255 Maximum length L (monitor direction)	
5 - repetitions Time during which repetitions are permitted (Trp) or number of repetitions	

When using an unbalanced link layer, the following ASDU types are returned in class 2 messages (low priority) with the indicated causes of transmission:

The standard assignment of ASDUs to class 2 messages is used as follows:

Type identification	Cause of transmission

A special assignment of ASDUs to class 2 messages is used as follows:

Type identification	Cause of transmission
1, 3, 11, 13, 15, 30, 31, 35, 36,37	<3>

NOTE: In response to a class 2 poll, a controlled station may respond with class 1 data when there is no class 2 data available.

IEC 60870-5-104

Frame format FT 1.2, single character 1 and the fixed time out interval are used exclusively in this companion standard.

Link transmission procedure	Address field of the link
<input checked="" type="checkbox"/> Balanced transmission	

<input checked="" type="checkbox"/> Unbalanced transmission Frame length <input checked="" type="checkbox"/> Maximum length L	<input checked="" type="checkbox"/> Not present (balanced transmission only) <input checked="" type="checkbox"/> One octet <input checked="" type="checkbox"/> Two octets <input checked="" type="checkbox"/> Structured <input checked="" type="checkbox"/> Unstructured
---	---

When using an unbalanced link layer, the following ASDU types are returned in class 2 messages (low priority) with the indicated causes of transmission:

■ The standard assignment of ASDUs to class 2 messages is used as follows:

Type identification	Cause of transmission

■ A special assignment of ASDUs to class 2 messages is used as follows:

Type identification	Cause of transmission

5. Application layer

Transmission mode for application data Mode 1 (least significant octet first), as defined in 4.10 of IEC 60870-5-4, is used exclusively in this companion standard.

Common address of ASDU

(system-specific parameter, all configurations that are used are to be marked with an X).

IEC 60870-5-101	IEC 60870-5-104
<input checked="" type="checkbox"/> One octet <input checked="" type="checkbox"/> Two octets	<input checked="" type="checkbox"/> One octet <input checked="" type="checkbox"/> Two octets

Information object address

(system-specific parameter, all configurations that are used are to be marked with an X).

IEC 60870-5-101	
<input type="checkbox"/> One octet	<input checked="" type="checkbox"/> Structured
<input checked="" type="checkbox"/> Two octets	<input checked="" type="checkbox"/> Unstructured
<input checked="" type="checkbox"/> Three octets	

IEC 60870-5-104	
<input checked="" type="checkbox"/> One octet	<input type="checkbox"/> Structured
<input checked="" type="checkbox"/> Two octets	<input checked="" type="checkbox"/> Unstructured
<input checked="" type="checkbox"/> Three octets	

Cause of transmission

(system-specific parameter, all configurations that are used are to be marked with an X).

IEC 60870-5-101	
<input checked="" type="checkbox"/> One octet	<input checked="" type="checkbox"/> Two octets (with originator address)

IEC 60870-5-104	
<input type="checkbox"/> One octet	<input checked="" type="checkbox"/> Two octets (with originator address)

Originator address is set to zero if not used

Selection of standard ASDUs

Process information in monitor direction

Type identification and cause of transmission assignments

((station-specific parameters).

IEC 60870-5-104		Cause of transmission															
Type identification		1	2	3	4	5	6	7	8	9	10	11	12	13	20-36	37-41	44-47
<1>	M_SP_NA_1																
<2>	M_SP_TA_1																
<3>	M_DP_NA_1																
<4>	M_DP_TA_1																
<5>	M_ST_NA_1																
<6>	M_ST_TA_1																
<7>	M_BO_NA_1																
<8>	M_BO_TA_1																
<9>	M_ME_NA_1																
<10>	M_ME_TA_1																
<11>	M_ME_NB_1																
<12>	M_ME_TB_1																
<13>	M_ME_NC_1																
<14>	M_ME_TC_1																
<15>	M_IT_NA_1																
<16>	M_IT_TA_1																
<17>	M_EP_TA_1																
<18>	M_EP_TB_1																
<19>	M_EP_TC_1																
<20>	M_PS_NA_1																
<21>	M_ME_ND_1																
<30>	M_SP_TB_1																
<31>	M_DP_TB_1																
<32>	M_ST_TB_1																
<33>	M_BO_TB_1																
<34>	M_ME_TD_1																
<35>	M_ME_TE_1																
<36>	M_ME_TF_1																
<37>	M_IT_TB_1																
<38>	M_EP_TD_1																
<39>	M_IT_TB_1																
<40>	M_EP_TD_1																

(station-specific parameter, mark each information type with an “X” where both a type ID without time and corresponding type ID with time are issued in response to a single spontaneous change of a monitored object) The following type identifications may be transmitted in succession caused by a single status change of an information object. The particular information object addresses for which double transmission is enabled are defined in a project-specific list.

- Single-point information M_SP_NA_1, M_SP_TA_1, M_SP_TB_1,
M_PS_NA_1
- Double-point information M_DP_NA_1, M_DP_TA_1, M_DP_TB_1
- Step position information M_ST_NA_1, M_ST_TA_1, M_ST_TB_1
- Bitstring of 32 bit M_BO_NA_1, M_BO_TA_1, M_BO_TB_1 (if defined for a specific project, see 7.2.1.1)
- Measured value, normalized value M_ME_NA_1, M_ME_TA_1, M_ME_ND_1, M_ME_TD_1
- Measured value, scaled value M_ME_NB_1, M_ME_TB_1, M_ME_TE_1
- Measured value, short floating point number M_ME_NC_1, M_ME_TC_1, M_ME_TF_1

Station interrogation

- Global
- Group 1 – Group 7 – Group 13
- Group 2 – Group 8 – Group 14
- Group 3 – Group 9 – Group 15
- Group 4 – Group 10 – Group 16
- Group 5 – Group 11 – Information object addresses
assigned to each group are
configurable
- Group 6 – Group 12

Clock synchronization

- Clock synchronization

Command transmission

- Direct command transmission
- Direct set point command transmission

- Select and execute command
- Select and execute set point command
- C_SE ACTTERM used
- No additional definition
- Short-pulse duration (1 sec.)
- Long-pulse duration (1 sec.)
- Persistent output (255 sec.)

Transmission of integrated totals

- Mode A: local freeze with spontaneous transmission
- Mode B: local freeze with counter interrogation
- Mode C: freeze and transmit by counter interrogation commands
- Mode D: freeze by counter-interrogation command, frozen values reported spontaneously
- Counter read
- Counter freeze without reset
- Counter freeze with reset
- Counter reset
- Clock synchronization
- Request counter group 1
- Request counter group 2
- Request counter group 3
- Request counter group 4

Parameter loading

- Threshold value
- Smoothing factor
- Low limit for transmission of measured value
- High limit for transmission of measured

Parameter activation

- Act/deact of persistent cyclic or periodic transmission of the addressed object

Test procedure

- Test procedure

File transfer

File transfer in monitor direction

- Transparent file
- Transmission of disturbance data of protection equipmen
- Transmission of sequences of events
- Transmission of sequences of recorded analogue values

File transfer in control direction

- Transparent file

Background scan

- Background scan

For IEC 60870-5-104 only:

Definition of time outs

Parameter	Default value	Remarks	Selected value
t_0	30 s	Time-out of connection establishment	
t_1	15 s	Time-out of send or test APDUs	15
t_2	10 s	Time-out for acknowledges in case of no data messages $t_2 < t_1$	10
t_3	20 s	Time-out for sending test frames in case of a long idle state	20

Maximum range for timeouts t_0 to t_2 : 1 s to 255 s, accuracy 1 s.

Maximum number of outstanding I format APDUs k and latest acknowledge APDUs (w):

Parameter	Default value	Remarks
K	1 APDU	Maximum difference receive sequence number to send state variable
W	1 APDU	Latest acknowledge after receiving w I format APDUs

K and W are not change.

Port number

Parameter	Value	Remarks
Port number	2404	In all cases