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# Input/output module ENMV-1W

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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, digital I/O.

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 ENMV-1W modification.

### Support

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

Website: [www.enip2.com](http://www.enip2.com)

Phone: +7 (8182) 65-75-65

E-mail: [enip2@ens.ru](mailto:enip2@ens.ru)



#### ATTENTION:

- Use ENMV-1W only according to this manual;
- ENMV-1W should be installed, operated and maintained only by qualified personnel;
- Do not use any cleanser except recommended by manufacturer;
- Save ENIP-2 from impact;
- Before connecting ENMV-1W, you must ensure that the local power supply conditions agree with the specifications on the label on the ENMV-1W.



#### NOTICE:

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

## Glossary

- AC – Alternating current
- DC – Direct current
- DO – Digital output
- PC – Personal computer;
- RTU – Remote Terminal Unit;
- SCADA – Supervisory Control And Data Acquisition
- SSR – Solid-state relay

# 1 General information

I/O modules ENMV-1W used for transmission to the remote control non-electric parameters, such as temperature, humidity, pressure, security alarm statuses and etc.

All sensors are connected to 1-Wire bus.

Data transmission is occurred via serial RS-485 interfaces to the RTU, SCADA and etc., using Modbus or IEC 60870-101.

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

ENMV-1W is multifunctional, repairable, restorable device. It designed for continuous operation in industrial installations.

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## 2 Design, dimension, naming convention

ENMV-1W has plastic housing for 35-mm DIN-rail mounting.

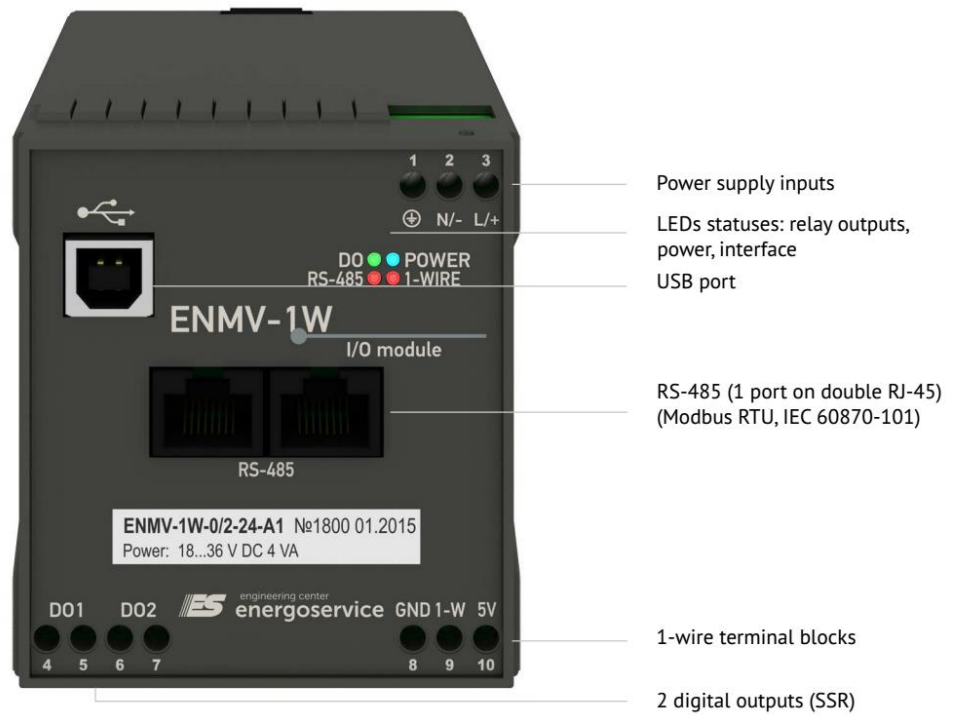


Figure 2.1. Front side of ENVM-1W.

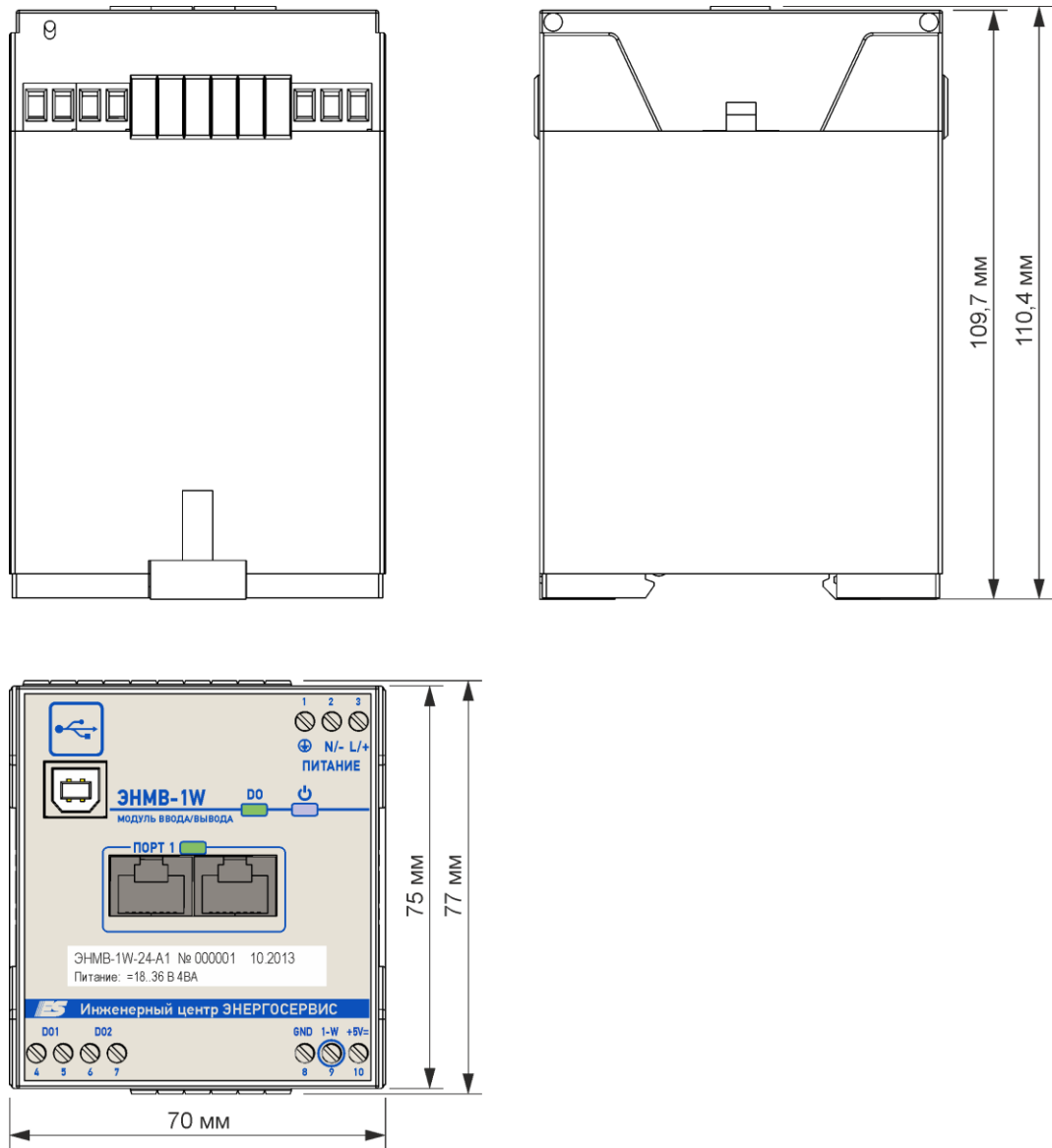
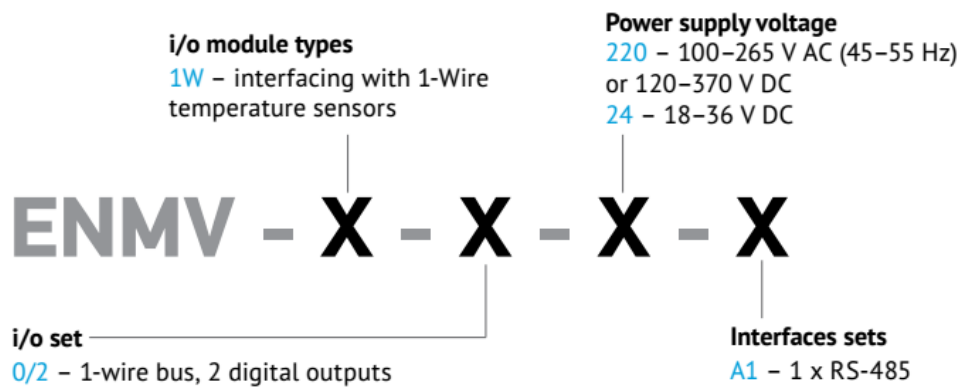


Figure 2.2. Dimension of ENMV-1W.

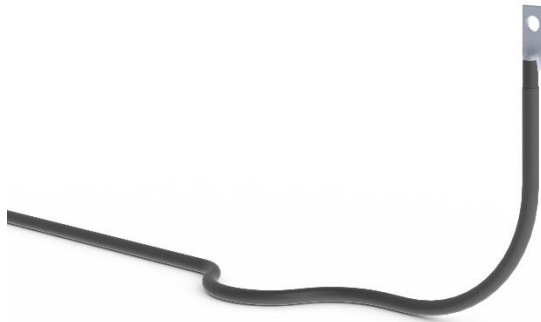


## 3 Specification

### 3.1 Sensors

#### Available sensors:

Temperature sensor TS-1W-5



Humidity/Pressure/Temperature sensor HPTS-1W



Bracket with protection shield for temperature sensor available for order. Bracket's design and dimension see in Fig. 3.1, 3.2.

Table 3.1

Temperature sensor modification	Temperature range
<b>Standard</b>	$-20^{\circ}\text{C} \leq t \leq +75^{\circ}\text{C}$
<b>Outdoor</b>	$-40^{\circ}\text{C} \leq t \leq +75^{\circ}\text{C}$
<b>Special</b>	$-55^{\circ}\text{C} \leq t \leq +125^{\circ}\text{C}$

Table 3.2 – Measure range and accuracy

Parameter	Measure range	Accuracy
<b>Temperature</b>	$-40^{\circ}\text{C} \leq t < -10^{\circ}\text{C}$	$\pm 2^{\circ}\text{C}$
	$-10^{\circ}\text{C} \leq t \leq +85^{\circ}\text{C}$	$\pm 0.5^{\circ}\text{C}$
<b>Humidity</b>	0...100%	$\pm 3.5\%$
<b>Pressure</b>	60...115 kPa	$\pm 1\text{ kPa}$





Figure 3.1. Bracket with protection shield for temperature sensor.

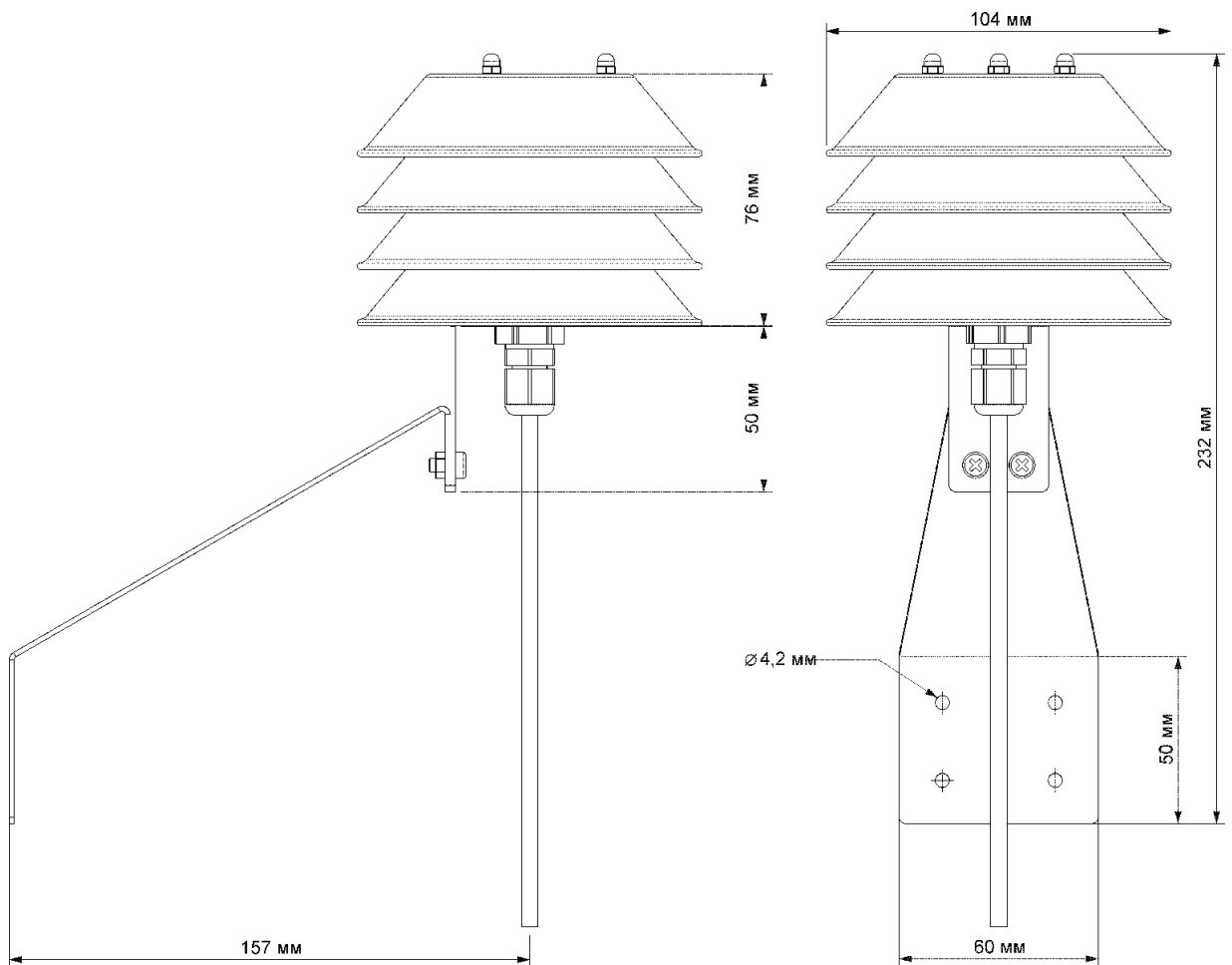


Figure 3.2. Dimension of bracket for temperature sensor.

## 3.2 Technical data

Table 3.3

Parameter	Value
<b>Dimension, WxHxD, mm</b>	75x70x110
<b>Mounting</b>	35-mm DIN-rail
<b>Interfaces</b>	Double port 1 (RS-485): Modbus RTU, IEC 60870-5-101-2006; 1-Wire: Up to 30 sensors. Service USB for configuring
<b>Digital output</b>	2 DO: Nominal current - 130 mA, Maximum current - 220 mA; Nominal voltage - 220 V (AC/DC), Maximum voltage - 400 V (AC/DC).
<b>Setpoints</b>	Up to 30 configurable setpoints.
<b>Operating temperature, °C</b>	-40...+70
<b>Relativity humidity (non condensing)</b>	5-95%
<b>Operating atmospheric pressure, kPa</b>	70-106
<b>Operation mode</b>	continuous
<b>Turn-on time</b>	<30 sec
<b>MTBF</b>	35000 h
<b>Device life</b>	15 year
<b>Seismic sustainability</b>	Up to 6 degree MSK-64

## 3.3 Interfaces

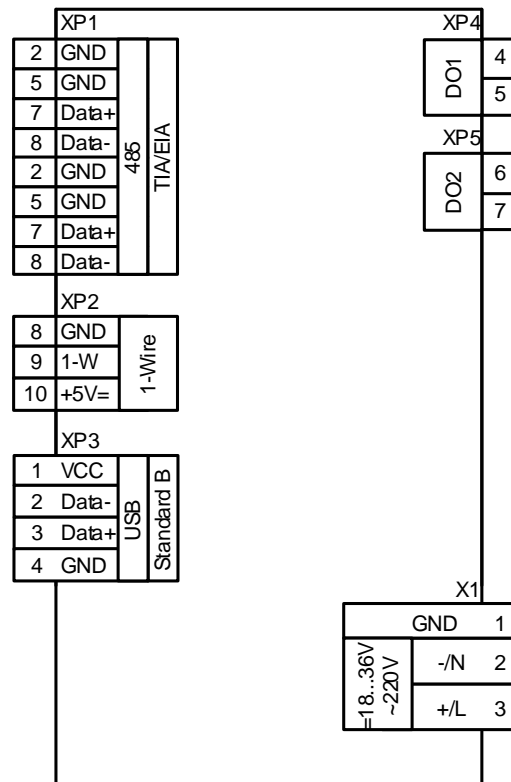


Figure 3.3. ENMV-1W interfaces assignment.

Table 3.4

Terminal	Description
XP1	RS-485
XP2	1-Wire
XP3	USB
XP4	DO1
XP5	DO2
X1	Power supply

### 3.4 Power supply

Table 3.5

Modification	Voltage	Consumption
ENMV-1W-0/2-220-A1	100...265 V AC, 45...55 Hz 120...370 V DC	4 VA
ENMV-1W-0/2-24-A1	18...36 V DC	4 VA

## 4 Package content

Input/output module ENMV-1W	1;
Temperature sensor 1-Wire with cable 2 m.	2;
ENMV.423000.005PC	1;
CD with Manual ENMV.423000.005 and software: «ES Configurator»	1;

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

## 5 Operation

### 5.1 Before performing installation

After receiving ENMV-1W from manufacturer, make sure that packing has no defects.

Unpacking ENMV-1W, check the package contents.

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

ENMV-1W operation should be as manual only.

Before connect/disconnect ENMV-1W to digital interface or sensors make sure that all sources of power supply are disconnected.

Connection ENMV-1W to RTU (or SCADA) is provided according to manual of RTU (SCADA).

Do not use ENMV-1W in explosive or corrosive environment.

Save ENMV-1W from heating above 70 °C, large temperature variations and strong electro-magnetic 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.

ENMV-1W is mounted on 35mm DIN-rail.

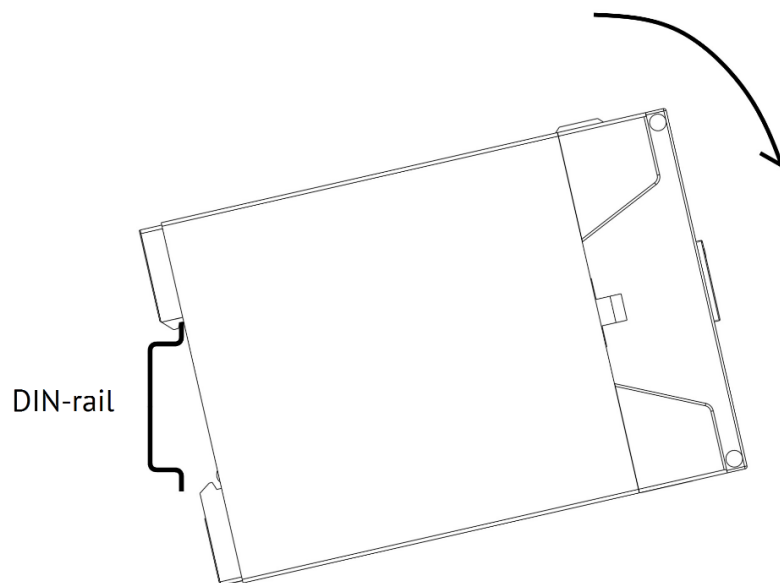


Figure 5.1. ENMV-1W installation to 35 mm DIN-rail

Pull down the clip in bottom to remove ENMV-1W from DIN-rail.

## 5.2.1 Terminals connection



**Notice:** Use surge protection devices for interfaces. For example ESP-485-1 for RS-485; Haket P IV for power supply.

Recommendation for wires:

Parameter	RS-485	Power supply
<b>Maximum wire size</b>	0.5-0.6 mm <sup>2</sup> (24 AWG)	2.5 mm <sup>2</sup> (14 AWG)
<b>Maximum wire length</b>	1200 m (without repeater)	-
<b>Recommended wire</b>	Shielded twisted pair	-
<b>Terminals</b>	RJ-45: 7 – Data+ 8 – Data-	1 - protective ground; 2 – neutral (negative for DC); 3 – phase (positive for DC)

Full terminals assignment see on Fig. 3.3 and Table 3.4

## 5.2.2 1-Wire sensors connection

ENMV-1-1W supports up to 30 sensors (2 temperature sensors included; additional sensors, and bracket with protective shield are optional). Connect sensors according to Table 5.1.

Table 5.1

Terminal	Description	Sensor's wire
Nº8	GND	Blue
Nº9	1-W	White-blue
Nº10	+5V=	Orange

## 6 Configuring

### 6.1 Firmware update

We are always working for add new features and improvements for ENMV-1W. So, before using of ENMV-1W, please, check the latest firmware and software on our web site for ENMV-1W. For writing new firmware to ENMV-1W use special update utility “ES Bootloader”. In addition, you can download it from our web site too.



Download latest firmware and software: <http://www.enip2.com/support/>

### 6.2 Software «ES Configurator»

Software «ES Configurator» are used for configuring ENMV-1W. The last version of configuration software you can download here: <http://enip2.ru/software/esconfigurator.zip>

To install the program, just copy and unzip downloaded archive in some folder on your PC.

## 7 Maintenance

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

Repair of defective device produced only by manufacturer. Do not open the housing during operation. Opening the ENMV-1W voids the warranty.

For preventive maintenance, follow instruction bellow:

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

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



## 8 Transport, packing and storage

ENMV-1W is transported in any covered transport (railway, car, aviation). Transport conditions temperature is  $-50...+70^{\circ}\text{C}$ , relative humidity is 95 % at  $30^{\circ}\text{C}$ . Save ENMV-1W from impact during the transport.

ENMV-1W is delivered in packaging case. Package has content according to page 12.

Maximum net weight is 0.5 kg, gross weight is 0.6 kg.

Store the device in dry and clean location. Storage condition in follow table:

Condition	Device in manufacturer packing	Device without manufacturer packing
Temperature	5-40 °C	10-35 °C
Relative humidity	80% (at 25 °C)	80% (at 25 °C)