



GPS-1

TIME SYNCHRONISATION

APPLICATION

The GPS-1 relay is meant for synchronisation of real time in protection system devices with the UTC standard.

CONSTRUCTION OF THE RELAY

The relay is based on 12-channel GPS receiver (SiRFstar III). It is equipped with the following communication channels:

- interface type RS232 – terminals 1 (RxD), 5 (TxD) i 11 (GND) - standard
- interface type RS232 – socket type DBF09F - option
- fibre optic cable interface with terminal clip type ST – option

Attention: At a same moment of time bidirectional communication is possible only with one communication channel, all other terminals may only send information.

Additionally, the relay is equipped with terminal 1PPS (pulse per second) in form of two terminals OC type:

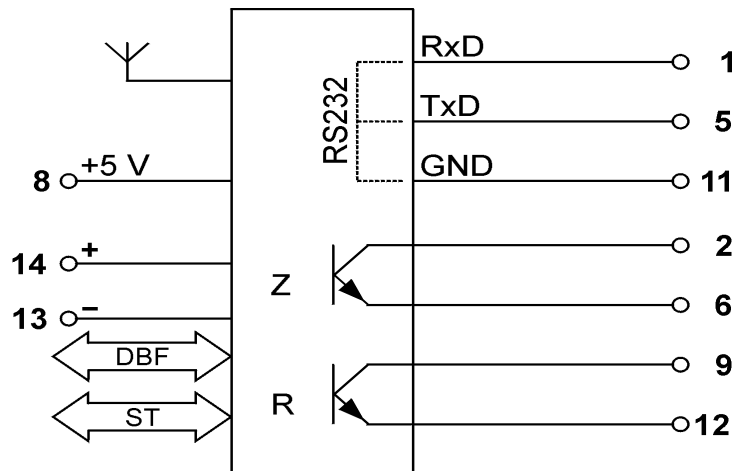
- output terminal marked as Z (terminals 2 and 6) – shortcut time 200ms each 1 second,
- output terminal marked as R (terminals 9 and 12) – shortcut time 800ms each 1 second;

Diodes on the front panel of the GPS-1 relay marked as RxD i TxD inform about proper communication between the relay and a device. Diode marked as “Pulse” informs about operation of 1PPS terminals, and the “ZASILANIE” diode informs about presence of power supply.

The relay is provided with an antenna (magnetic mounting) with 5m-long cable and SMA terminal, to be tightened to the relay.

The relay can be supplied with 220 V DC (terminals 13, 14) or 5 V DC (terminals 8 and 11).

Scheme of connections is presented on picture 1.



Picture 1. GPS-1 relay – functional scheme

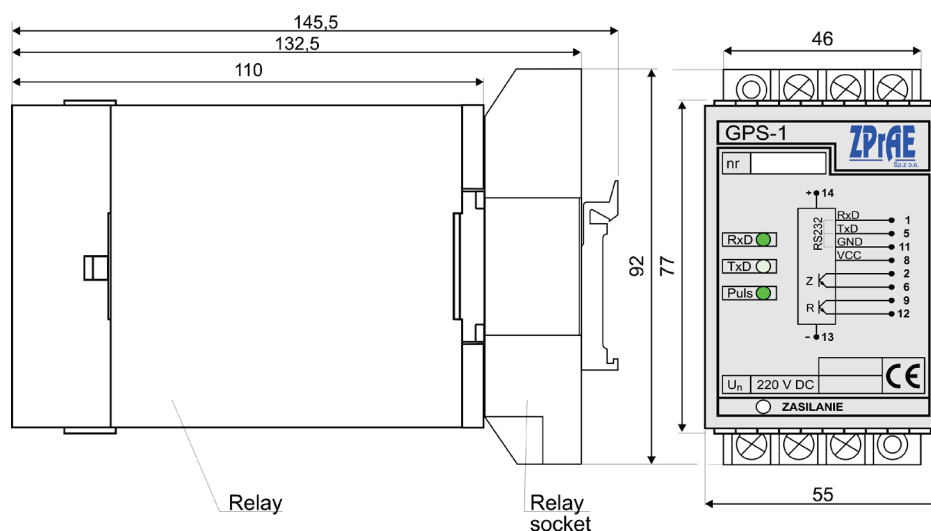
The relay is mounted in a typical CN 55 AK housing size 110 × 55 × 77 mm, with 14 terminations in a form of a plug, suitable to be mounted in a GZ-14 socket (plate-mounting), GZ-14U (bus-mounting) or GZ14Z - to be mounted in a relay chassis type R8614Z. Dimensions of the relay are presented on Picture 2.

OPERATION

When supply voltage of 220 V DC or 5 V DC is applied a green LED diode “ZASILANIE” lights up. After reaching contact with the GPS satellite system, app. after 1 minute, the internal clock of the relay is synchronised with the UTC time. This time does not include winter-summer changes. Information available from the GPS-1 relay with use of SIRF Binary and NMEA0183 protocols includes also actual location, height or speed. Generation of signal on 1PPS terminal (blinking light of the Pulse diode) means that the relay receives proper data from the satellite. High state on the 1PPS terminal (continuous light of the Pulse diode) means, that the relay does not receive signal from the satellite, or that the received information is incorrect.

TECHNICAL INFORMATION

Supply voltage	
Nominal value	$U_N = 220 \text{ V DC or } 5 \text{ V DC}$
Operating range	$0,8 \dots 1,1 U_N$
Power consumption	$\leq 1 \text{ W}$
GPS receiver	
Type	SiRFstar III JGR-SC3-M, 12-channels
Accuracy	$< 500 \text{ ns}$
Antenna	dimensions $34 \times 38 \text{ mm}$, magnetic mounting, cable – 5 m, SMA terminal
Communication	NMEA0183 ASCII Format Protocol (9600 bps) – default SiRF Binary Format Protocol (9600 bps)
1PPS Outputs (1 Pulse per second)	
Type of output	OC
Load	$U = 24 \text{ V DC}$, $I = 30 \text{ mA}$,
Duration of the impulse	output Z: $t_z = 200 \text{ ms}$ output R: $t_z = 800 \text{ ms}$
Insulation	
Rated insulation voltage	250 V
Overvoltage category	III
Proof voltage between the supply voltage 220 VDC, and 1PPS output.	2 kV; 50 Hz; 1 min
General Data	
Enclosure protection degree	IP40
Ambient temperature	From $-5 \text{ }^\circ\text{C}$ to $+40 \text{ }^\circ\text{C}$
Ambient protection	RT II
Signalisation of Operation	LED diodes RxD, TxD i Puls
Terminations (socket / plug)	GZ14
Dimensions	$77 \times 55 \times 110 \text{ mm}$ (refer to picture 2)
Mounting	As R15 to the Mounting socket



Picture 2. The Dimensions of the RS relay

Attention:

We have prepared a vast offer of auxiliary equipment in order to support mounting of our relays (cases, sockets, plugs). The auxiliary equipment is designed based on our clients suggestions and many years of our own experience. More information can be found in catalogue: "GZ-14/GZ-14Z, R-8614/R8614Z, ZAS-55, ZAS-70, plugs, sockets and relay-chassis" available at www.zprae.pl

GPS-1



OFFER

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ENERGETIC STANDARDS

RSH-3, RSH-3S - tripping

RS-6, RPD-2, RPP-4, RPP-6 - interposing

RMS-2 - signalling

RCW-3, RCDW-1 - circuit continuity monitoring

**RKO-3 - power supply circuit
continuity monitoring**

RB-1, RBS-1, RBS-2 - bistable

RT-22 - time

RUT-2, RUT-3 - time-voltage

RJT-1, RJT-3 - time-current

RKU-1, RKS-1 - final controlling

LZ-1, LZ-2 - operation counters

RPZ-1 - supply source switching

GPS-1 - time synchronisation

MDD-6, MDS-12 - Diode modules

**PH-XX, PS-XX - Modules of switches,
pushbuttons and control lamps**

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protections type TSL-9r, TSL-11**

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