TIME-NET Ltd.

AUTOMATICS AND PRECISE APPARATUS MANUFACTURING PLANT
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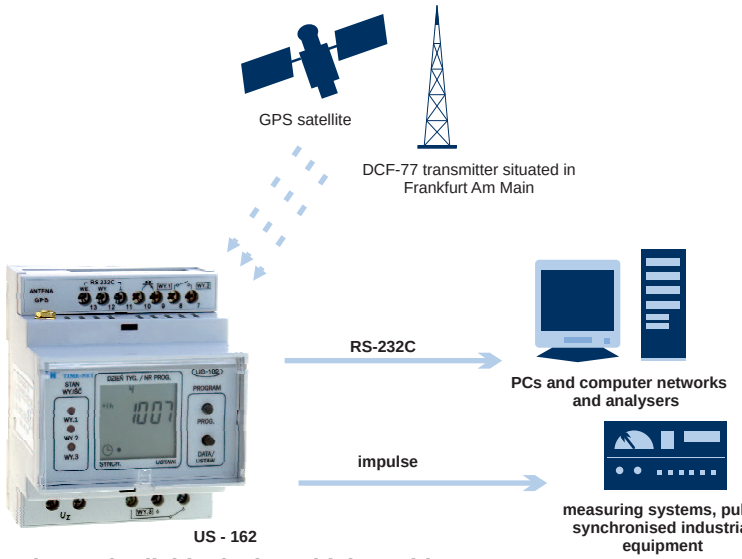
TIME SYNCHRONIZER FOR COMPUTERS AND INDUSTRIAL EQUIPMENT TYPE US-162

· Three types of impulse outputs for independent programming by the user:
  - transoptor output,
  - current output and
  - relay output.
· Serial interface RS232C or RS485
  Wide range of digital protocols (eg IRIG-B, AFNOR etc.)
  Possibility of DCF-77 signal simulation.
· Operation within any time zone.
· Function of automatic switching from/into winter/summer time in accordance with the European Union regulations with a possibility of its modification.
· Synchronization with DCF or GPS atomic time standard.
· Simple usage and user-friendly software.
· Modular housing 4m width for TS (TM) – 35 bus mounting.
· Device to be adjusted to individual orders.



APPLICATION:

Time synchronizer type US- 162 is a modern, simple in service and reliable device which enables:
- **Time synchronizing in measuring systems**
- **Time synchronizing in computer networks or singular PC's.**
- **Time synchronizing in industrial equipment, analysers and recorders.**
- **Resetting the maximum power counter.**

The synchronizer type US-162/DCF is equipped with an external antenna (receiver) of satellite signal DCF-77, whereas synchronizer type US-162/GPS is provided with an external antenna and built-in receiver of the satellite GPS system (Global Positioning System). In both cases autonomous timer of the synchronizer is being synchronized on a current basis with the atomic time standard, thanks to which it does not require any manual setting and adjustments.

The synchronizer may be equipped with maximum three impulse outputs :
WY.1 (terminals 9,10 on the upper strip) - transoptor output – transistor key of OC type)
WY.2 (terminals 7,8 on the upper strip) - current output generating current of 10,20 or 30 mA as specified in the order, or relay output with a closing contact pulled out non-potentially
WY.3 (terminals 4,5,6 on the lower strip) - relay output with a switching contact pulled out non-potentially.

For each of outputs the it is possible to introduce the following parameters independently by the user , which will define the generated synchronizing impulse:
- moment of appearance (beginning of: a second, a quarter of an hour, each hour or starting of any randomly chosen hour or minute within the 24-hour range),
- duration falling within the range from 30ms up to 9999ms (for impulses appearing every 1 second starting from 30ms up to 599ms),
- polarization (positive or negative impulse) with the omission of WY.3.

On the front plate LED indicators are placed, which inform about operating conditions of each impulse output.

Remark: Synchronization impulses, as a standard, will appear on impulse outputs on condition that synchronization indicator has been displayed, whereas an impulse appearing every 1 second is generated independently of synchronization with an accuracy, corresponding to the internal time standard.

US-162 may be also equipped with the interface RS-232C or RS485. It enables to transfer the introduced date and time to external devices. The User's manual includes description of the transmission protocol, which enables to use this interface in the user's own applications. DCF-77 simulation and other standard protocols are also available. At the request of the Orderer, it is possible to deliver relevant application software to operate in MS Windows 2000/XP/7/8 environments.

Programming of all settings on the device is carried out with the LCD display and two pushbuttons placed on the front panel, or through RS-232C interface and any available terminal application (e.g. HyperTerminal within the Windows system).
Sequential displaying of the date and the programmed parameters of synchronization impulses may be started by setting time of a single screen display within the range from 1 up to 6 seconds.

Detailed specification of the type to be used in the order: US-162/A/B/N/C,
where fields A,B,N and C should be filled in with symbols indicated in the table below, depending on the configuration of the device to be ordered.

Field	Symbol	Description
A	DCF GPS	synchronization with DCF-77 signal synchronization with GPS signal
B	10, 20, or 30 REL	current output – current generated in [mA] relay output – closing contact
N	230 100 24	alternating voltage 230 VAC alternating voltage 100 VAC direct voltage 24 VDC

C - type of serial port (RS-232C is a standard, optionally RS-485).

Remark: The following accessories may be ordered additionally for the device provided with RS232C interface:
- **RS-232C cable with a length of 15rm along with the software needed for synchronization of the computer clock working in the environment of: MS Windows 2000/XP/7/8;**
- **(for the US-162/GPS version) – GPS antenna equipped with cable with a length of: 25 rm instead of standard 5rm;**
- **(for the US-162/DCF version) – antenna along with an antenna cable with a length of: 5 rm, 10 rm, or 25 rm.**

Example:
US-162/GPS/30/230/485
US-162/DCF/REL/24+ antenna cable (25 rm)

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TECHNICAL DATA:

- Power supply voltage (depending on version)	alternating 100VAC -10%+20% or alternating 230VAC -15% +10%, 50Hz±5% or direct 24VDC (18÷36VDC) terminals: 1(+), 2(-)
- Power consumption	ca. 4VA (3W)
- Protection class	II as per EN 61140:2002
- Display	LCD
- Time zone programming	Yes, by indication of time shift in relation to GMT time
- Programming of switching from/into winter/summer time	Yes, by determination of the key (mode)
- Accuracy in the whole temperature range:	
- in autonomous working mode	±1.1x10-5 (below ±1s/24hr)
- when working with DCF or GPS antenna	equal to accuracy of the atomic standard
- Load capacity of outputs:	
- relay outputs (relay of RM96 type)	8A, 250VAC(resistive load)
- transoptor output (OC type)	“open collector” 50mA,80VDC
- current source output (current output)	10mA,20mA or 30mA -2%+10%,24 VDC
- Galvanic separation between (there is no separation between RS-232C interface and antenna):	
- terminals 1 and 2 of the alternating supply voltage 100VAC or 230VAC and the other terminals	4 kVAC
- terminals 1 and 2 of the direct supply voltage 24VDC and the other terminals	1.5 kVDC
- impulse outputs and impulse outputs and the RS-232 interface	2.5 kVAC

Remark: In versions fed with direct current 24VDC there is no galvanic separation between antenna, current source and RS serial interface. For this reason, in this version, current output and RS serial interface cannot be installed together.

- Time and frequency of synchronizing impulses	Programmable by the User
- Measurements	90 x 71 x 73
- Mass	Max. 400 g
- Protection class of housing	IP20 as per EN 60529
- Ambient conditions:	
- temperature range	-20ºC÷+55 ºC
- pressure range	86÷106 kPa
- humidity	Max. 90% (without condensation)
- allowed rate of ambient temperature change	5ºC/hr
- insolation	No direct exposure to insolation
- ventilation	Natural
- Indicator of receiving DCF or GPS signal	Dot on the LCD display pulsing with the signal 1PPS
- Indicator of reaching synchronization (SYNCH)	Clock symbol on the LCD display
- Period of displaying synchronization indicator	120 hr from the last synchronization
- Indicator of outputs condition	Yes, LED type on the front panel of the device

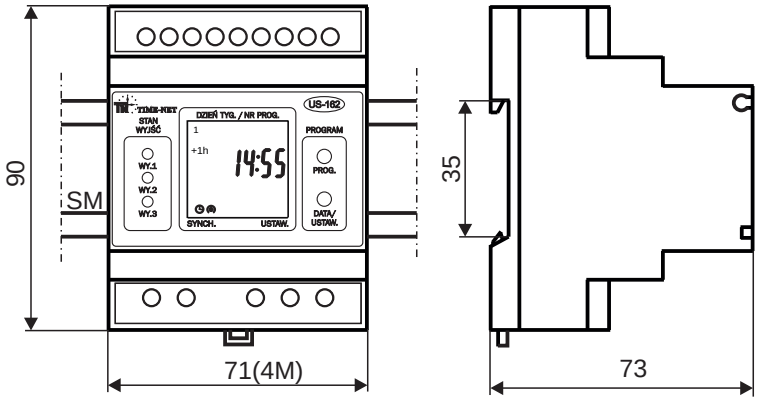
Technical data of GPS antenna:

- Mass	40g
- Dimensions/fixing	45 x 45 x15/magnet
- Protection class	IP 65 as per EN 60529
- Standard length of antenna cable	10 m concentric RG174U
- Power supply	3 VDC, 30 mA
- Working frequency	1575.42 MHZ
- Ambient temperature range	-40ºC up to +100 ºC

Remark: It is possible to use additional extension cord for antenna HT cable with a length of max.10 m, or to order a version equipped already by the manufacturer with GPS antenna cable with a length of 25 m.

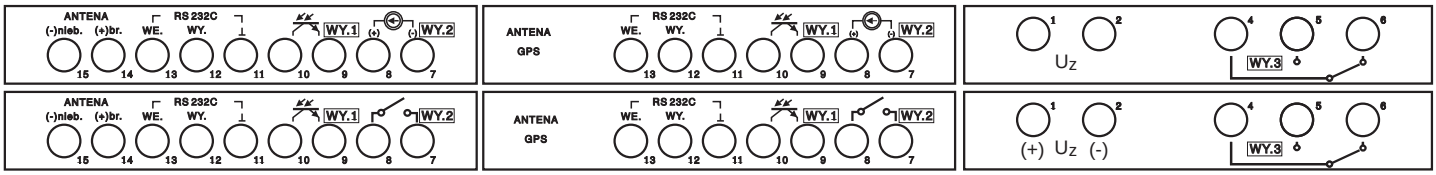
Technical data of DCF antenna:

- Dimensions/fixing	∅28 x 115/holder
- Protection class	IP 54 as per EN 60529
- Power supply	10 mA, direct current
- Receiving frequency	77.5 kHz
- Ambient temperature range	From -20ºC up to +60 ºC
- Standard cable length 2 m simmetric (OMY 2x0.75mm2)	



M - module of max. 18mm in width SM - mounting rail TS (TH) - 35
Both terminal strips are prepared for cables with sections of max. 4mm^2.
Measurements of synchroniser.

Remark: Antenna cable may be extended to max. 300 m with a cable (2x0.75mm2) without any additional operations. Both types of external antennas are delivered with the appropriate fixtures.



Sample markings on the upper terminal strips Sample markings on the lower terminal strips

The manufacturer reserves the right to introduce changes in the construction of the product being the subject of this catalogue card.