

GPS-Sync

GPS time reference for equipment synchronization



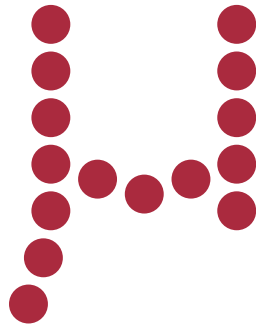
Modular GPS Device for Versatile Substation Synchronization



Specially designed for harsh environments in terms of electromagnetic noise and overvoltages.

High Synchronization power output, for maximum distance or high number of devices to be synchronized.

Versatility in number and type of synchronization ports.



μSysCom
2017



GPS-Sync



Main Characteristics

- Large, highly visible display
- Loss of synchronism alarm
- Internal clock backup when satellite synchronization is unavailable
- Configurable Timepulse signal
- 4 IRIG-B outputs, with adjustable power level
- 4 optional IRIG-B un-modulated output via F.O. for long distances, or coax. with TTL levels
- RS-232 ASCII output for various protocols
- Easy adaptation to other specific protocols

Description

Precise time accuracy for distributed networks is critical for system synchronization. The **GPS Sync** utilizes precision time and date stamping for these critical time reference applications where distance limitations occur.

The key element for synchronization is the reference clock. The **GPS Sync** is an electronic device intended to synchronize various IEDs (Intelligent Electronic Devices) with a common, high accuracy time reference obtained from the GPS satellite system.

Synchronizing system devices with the GPS Sync allows for precise analysis of events that affect geographically diverse areas of the entire system.

The possibility of modularity of the GPS Sync and the high power outputs provide synchronization to equipment for longer distances than typical designs. And its industrial design and full protection make the GPS Sync the best choice for harsh conditions, such as the ones in electrical substations.



The modular design of the GPS Sync provides synchronization to equipment for longer distances than typical designs. The modules that comprise the GPS Sync are:



Reference clock: Located adjacent to the antenna, it provides a local time reference.



Synchronizer: Distributes the synchronization signal into various formats / protocols to incorporate a diverse number of IEDs, distributed over varying distances into the network.

Human Machine Interface

GPS Sync Human Machine Interface consists of a service serial port (SRV), and optionally, a configuration wheel and a graphical display.

The display continuously shows timing information until the user pushes the configuration wheel. Once the user enters a valid password, the user can navigate through a configuration menus tree (turning it right and left). To select an option or a character, the wheel must be pressed.

Configuring GPS Sync

GPS Sync can be configured locally through its serial port or through the configuration wheel/display.

Serial port configuration

Using a terminal emulation, such as Windows HyperTerminal, through GPS Sync front serial port – SRV.

Display and configuration wheel

By rotating the configuration wheel, the user can navigate through the different menu options. To select a menu option, the user just needs to click on the configuration wheel.

For both configuration options (front serial port & configuration wheel), exactly the same menu options will be available.

GPS Configuration parameters

Configuration parameters can be modified using a multi-level menu. Main configuration options can be grouped into:

Language: Several languages are available for displaying the menu options.

GPS Clock Configuration: Quality parameters related to GPS receiver can be set in order to indicate when GPS signals fulfill certain quality requirements (number of satellites, DOP, C/N ratio)

Sync channels configuration: This option allows the user to enable / disable the available Sync channels. Once enabled, all digital channels can be individually configured (sync protocol & customization options for the selected sync protocol).

Site-specific configuration: This option includes parameters related to the site where the GPS Sync is to be installed.

Password: This option allows the user to change the configuration password.

Event Log: Access & Configuration.




GPS Antenna

GPS Sync is provided with an standard 26 dB gain antenna. This antenna is enough for most of the applications.

However, optionally, 30 dB and 40 dB gain antennas can be also provided by uSysCom.



 **Quick and easy configuration, either manually or making use of a local PC connection**



Synchronizing multiple IED's using IRIG-B

Multiple channels available

GPS Sync main purpose is to synchronize multiple IED's (intelligent electronic devices) using the most popular sync protocols.

GPS satellites are continuously broadcasting timing information. uSysCom GPS Sync is able to receive and process up to 16 received signals. Once the timing information is obtained, GPS Sync broadcast the above timing information simultaneously on all enabled synchronization channels using the pre-selected synchronization protocols.

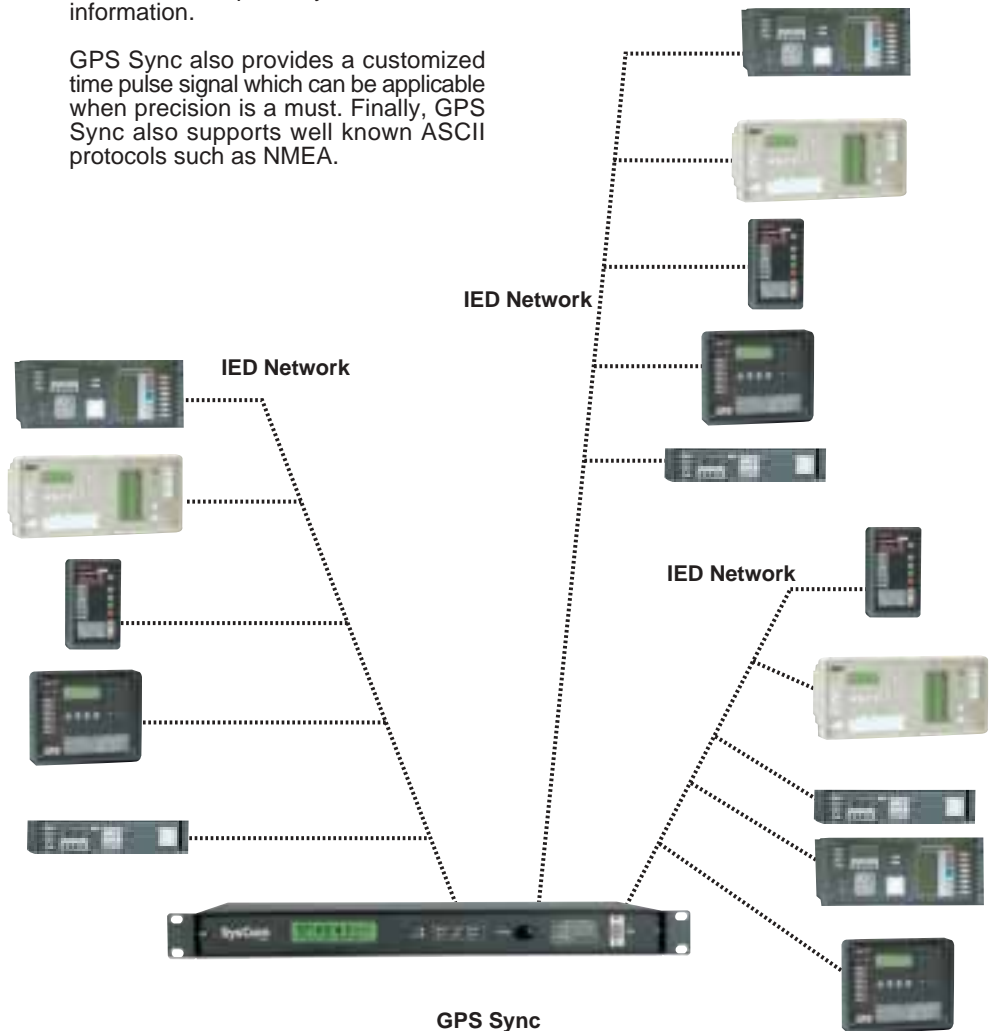
GPS Sync supports IRIG-B protocol, which is widely used on different vendors IED's that require synchronization information.

GPS Sync also provides a customized time pulse signal which can be applicable when precision is a must. Finally, GPS Sync also supports well known ASCII protocols such as NMEA.

GPS Sync is able to synchronize multiple vendors IED's based on IRIG-B protocols.

GPS Sync alone can synchronize up to 48 IED's which can be distributed in 4 different IRIG-B123 synchronization buses. 12 IED's will be synchronized on each synchronization bus.

GPS Sync multiple synchronization channels provides customers great flexibility that allows different cabling strategies.



Reliable device synchronization for event logging and tracking in industrial environments.



There are different high output power channels to synchronize more than 40 devices with a single GPS Sync unit.

Establishing a timing bus between a GPS Clock and several GPS Sync

One of the main requirements for a GPS system based equipment to work properly is to install the GPS antenna with an excellent sky visibility.

Some installations require great distances between the GPS antenna and the sync equipment. For those cases, a timing network as depicted below can be established based on RS485.

This network is composed of a GPS Clock, that can be installed next to the GPS antenna, and several GPS Sync which use the same GPS information to broadcast the different synchronization signals.

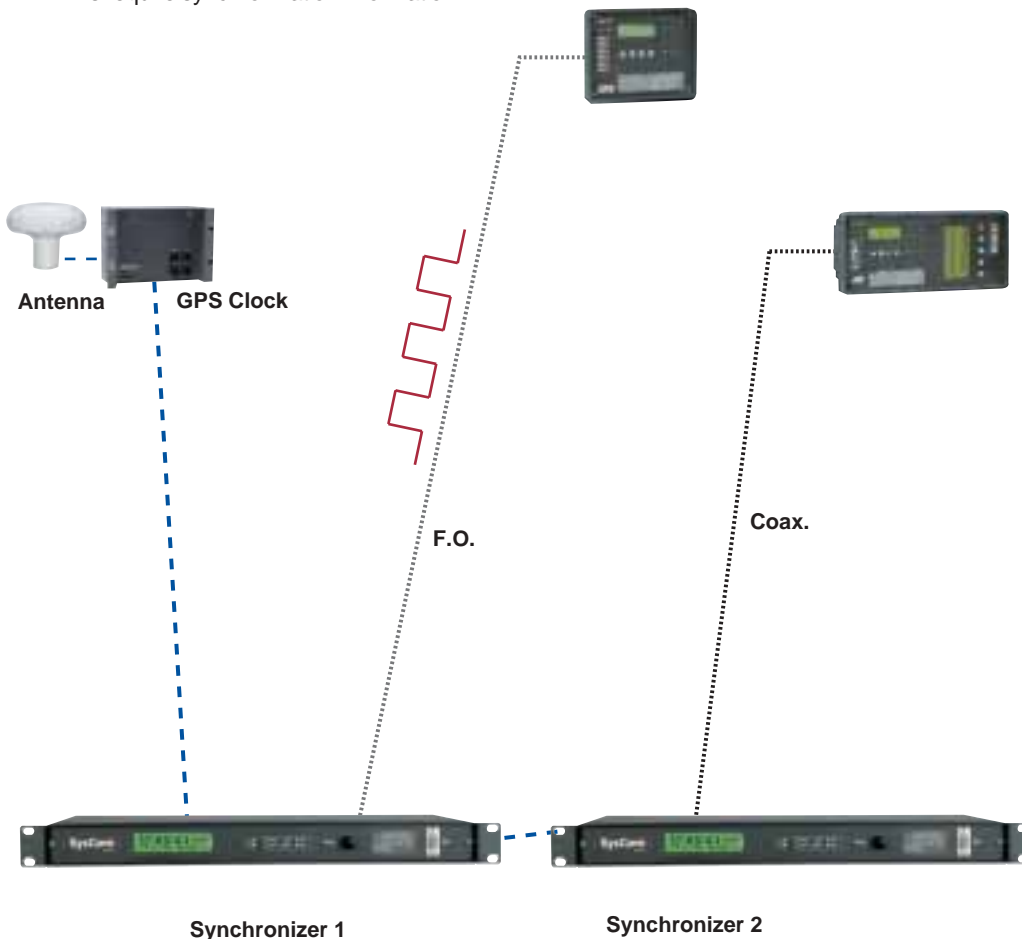
This feature is also important in those big installations where a great deal of IED's require synchronization information.

A long distance transmission of an accurate customized Timepulse signal

The customer can set up the behaviour of the different synchronization digital channels. Apart from the IRIG signal, a customized timepulse signal can be selected. The customer can set up both, the pulse width and pulse frequency.

This Timepulse signal can be used to trigger certain scheduled events in different IED's. Note the great driving capabilities (up to 20 Ohms – 250 mA in each output).

All digital signals can be transmitted long distances using multimode fiber optic option.



Quick and easy configuration for all the different synchronization channels available.



Depending on the required topologies and distances, GPS Sync offers a wide range of configuration options



Warranty

All products and services sold by uSysCom are warranted against any defect in design, materials and workmanship for a period of two years after of delivery.

Quality

uSysCom owns the quality company certificate ISO 9001-20

From uSysCom, we are highly committed with a Continuous Improvement Plan, following the Total Quality Policies.



Assistance

uSysCom offers a high quality local support service wherever you are. In Spain, Brazil and U.S.A. it is directly offered by ZIV resources. For the rest of the world, there is a local partner network to offer support service.

Additionally, there are different permanent assistance services (24 hours /day, 365 days/year) for immediate support



24 h. Service for Spain and Europe



24 h. Service for Brazil and South America



24 h. Service for U.S.A. and Canada

Technical Characteristics

SYNCHRONIZER

Interfaces:

Power Supply:

AC/DC multirange, <25W

Synchronization channels

4 BNC for modulated IRIG-B, 5Vpp@50 ohms, with configurable power output.

3 BNC for un-modulated IRIG-B, or open drain outputs, 300 mA max. Selectable to Programmable Pulse / 1 PPS.

1 BNC, selectable as un-modulated IRIG-B output or reference input for other ports.

COM1: ASCII format information, via F.O. or RS232, with 1PPS included .

SRV:

RS232 configuration port.

Contact output:

Loss of synchronism alarm.

Optional:

BNC connectors replaced by pin terminal block.

4 F.O. ST Connectors, or plastic fibre, for un-modulated IRIG-B, 1PPS or programmable Pulse.

LEDs:

Synchronization equipment status.

Reference clock status.

Synchronization signals status.

Optional:

Large, highly visible display.

Configuration wheel.

Acoustic alarm.

Size:

Rack 1U.

REFERENCE CLOCK

Interfaces:

8 pin strip connector

1 RS-485 port

Power: 9-36 VDC, <3W

Timepulse signal

SMA antenna connector.

It supports active antenna, with short or open circuit detection

GPS Characteristics:

L1 band

C/A Code, 16 channels

Acquisition:

Cold Start: 42 sec.

Warm Start: 38 sec.

Hot Start: < 8 sec.

Signal readquisition

< 1 sec.

Accuracy

(DGPS, SA off): CEP < 2m.

Signals:

Timepulse

Clock pulses of configurable duration and frequency

NMEA

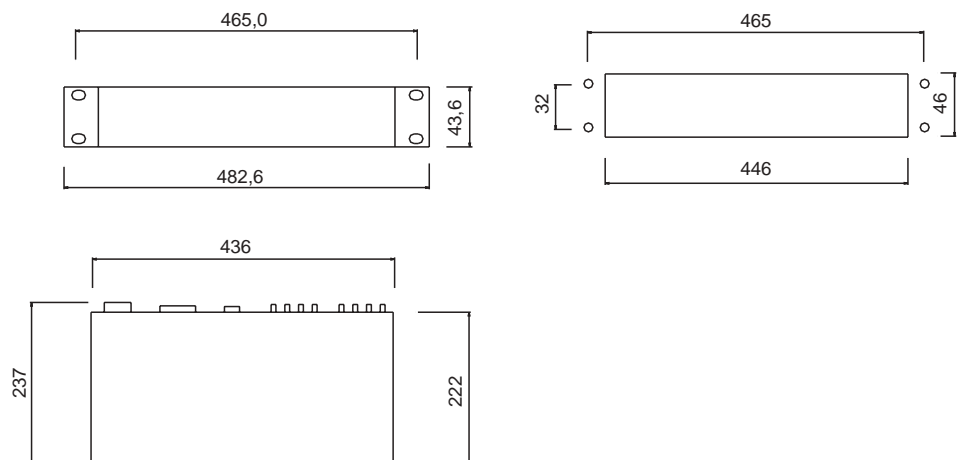
Character format information with position, speed, satellites in view

Mechanics:

Integrated in the same Synchronizer enclosure

In an independant enclosure

TYPE "E" ENCLOSURE



Dimensions in mm.

Model selection

Model selection, depending on the required characteristics, can be defined following this schema:

		G P S	
Product Type	Cod.	-	
Synchronizer	S		
Reference Clock	R*		
Reference Clock + Synchronizer	C	→	<input type="text"/>
Synchronization ports 1-4 + 9	Cod.		
BNC + DB-9	1		
BNC + FOC multimode	2		
8 pin terminal screw cage (5.08 mm pitch) + DB-9	3	→	<input type="text"/>
8 pin terminal screw cage + FOC multimode	4		
Circular Multipolar Connector	5*		
8 pin terminal screw cage (5.08 mm pitch)	6*		
Synchronization ports 5-8	Cod.		
Not available	0*		
F.O.C. multimode	1		
F.O. Plastic	2	→	<input type="text"/>
8 pin terminal screw cage (5.08 mm pitch)	3		
BNC	4		
Configuration Wheel + Display	Cod.		
Not available	0*	→	<input type="text"/>
Available	1		
Power Supply	Cod.		
Insulated: DC(12-75 VCC)	0		
Insulated: AC(50-260VAC@47-63Hz and DC(55-360VCC)	1	→	<input type="text"/>
Non Insulated: DC(12 VCC)	2*		
Special Protocols	Cod.		
Not used	0	→	<input type="text"/>
Enclosure	Cod.		
Rack 19" 1 U.	E		
Indoor	R*	→	<input type="text"/>
Outdoor	I*		
Revision	Cod.		
Not used	0	→	<input type="text"/>

*Only available options for the Reference Clock

Standards and Type Tests

Insulation Test IEC 255-5
 Between Circuits and Ground 2kV, 50/60 Hz for 1 minute
 Between Independent Circuits 2kV, 50/60 Hz for 1 minute

Impulse Test IEC 61000-4-5
 Common Mode 4 kV; 1,2/50 μs;0.5 J
 Differential Mode 2 kV; 1,2/50 μs;0.5 J

Fast Transient Disturbance Test IEC 61000-4-4 Class IV
 Power 4 kV±10%
 Data 2 kV±10%

Radiated Electromagnetic Field Disturbance Test IEC 61000-4-3
 Amplitude Modulated 10 V/m
 Pulse Modulated 10 V/m

Conducted Electromagnetic Field Disturbance IEC 61000-4-6
 Amplitude Modulated 10 V

Electrostatic Discharge Test IEC 61000-4-2 Class IV
 15 kV±10%

Radio Frequency Emissivity EN 55011 Class B, EN 55022 Class B

Electromagnetic Compatibility EN 61000-6-2; EN 61000-6-3; EN 61000-6-4

Temperature IEC 255-6
 Operating Range -40 °C to +85 °C
 Storage Range -50 °C to +100 °C
 Humidity 95% (non condensing)

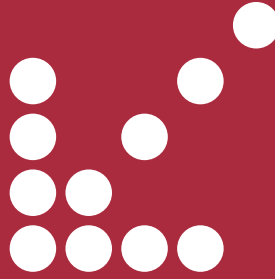
Power Supply Dips and Interruptions IEC 61000-4-11
 30% 500 ms
 60% 100 ms
 100% 10 ms

Vibration Test (sinusoidal) IEC 255-21-1 Class I

Shock and Bump Test IEC 255-21-2 Class I

All the models fulfill the 89/336/CEElectromagnetic compatibility directive.





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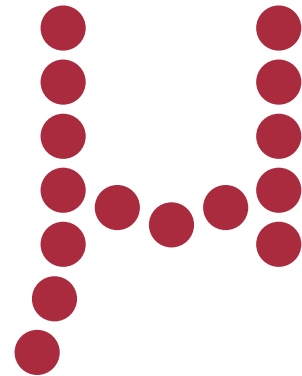
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