GPS Time Synchro Receiver with simultaneous tracking of up to 22 channels and synchronizing of up to 10 devices

Overview

The Global Positioning System (GPS) is a satellite based navigation system operated and maintained by the U.S. Department of Defense. The GPS consists of a constellation of 24 satellites providing world-wide, 24 hour and three dimensional (3D) signal coverage.

Although originally conceived for military needs, GPS has a broad array of civilian applications, including surveying, timing, marine, land, aviation and vehicle navigation. GPS is the most accurate technology available for vehicle navigation.

By computing the distance to GPS satellites orbiting the earth, a GPS receiver can calculate an accurate position. GPS receivers can also provide precise UTC time, speed, and course measurements which are beneficial for vehicle navigation.

The GTS9010 receiver is a complete 22 channels parallel tracking GPS receiver designed to operate with the L1 frequency, Standard Position Service, Coarse Acquisition code.

Based on Condor C2626 GPS™ core of Trimble Navigation Ltd, the receiver is developed to synchronize up to 10 devices, like Wally A RTU or other devices that need accurate synchronization signal

GTS9010 has 10 ports with RJ12 connector, each one providing:

- RS485 serial connection with NMEA 0813 protocol
- open-collector pulse-per-second (PPS) output synchronization signal
- GPS Receiver external power input (optional)

The power supply input can be provided equally by each of the 10 devices connected to the receiver, without the need to assign to a single device the function of power source and exclude all other. This standardization allows to simplify the interconnections in the field, with no possibility of errors or the need to use different wires between the different devices.

In addition a supply input for a separate optional external power supply can be provided, if the devices are not able to provide power to the GTS9010 receiver.

GTS9010 kit

The GTS9010 receiver kit is as follows:

- GTS9010 Receiver
- 10 mt. Cable for connection to Wally A RTU
- GPS antenna with magnetic mount, with cable 5 mt, with L bracket
- Bracket for wall mounting (see figure)
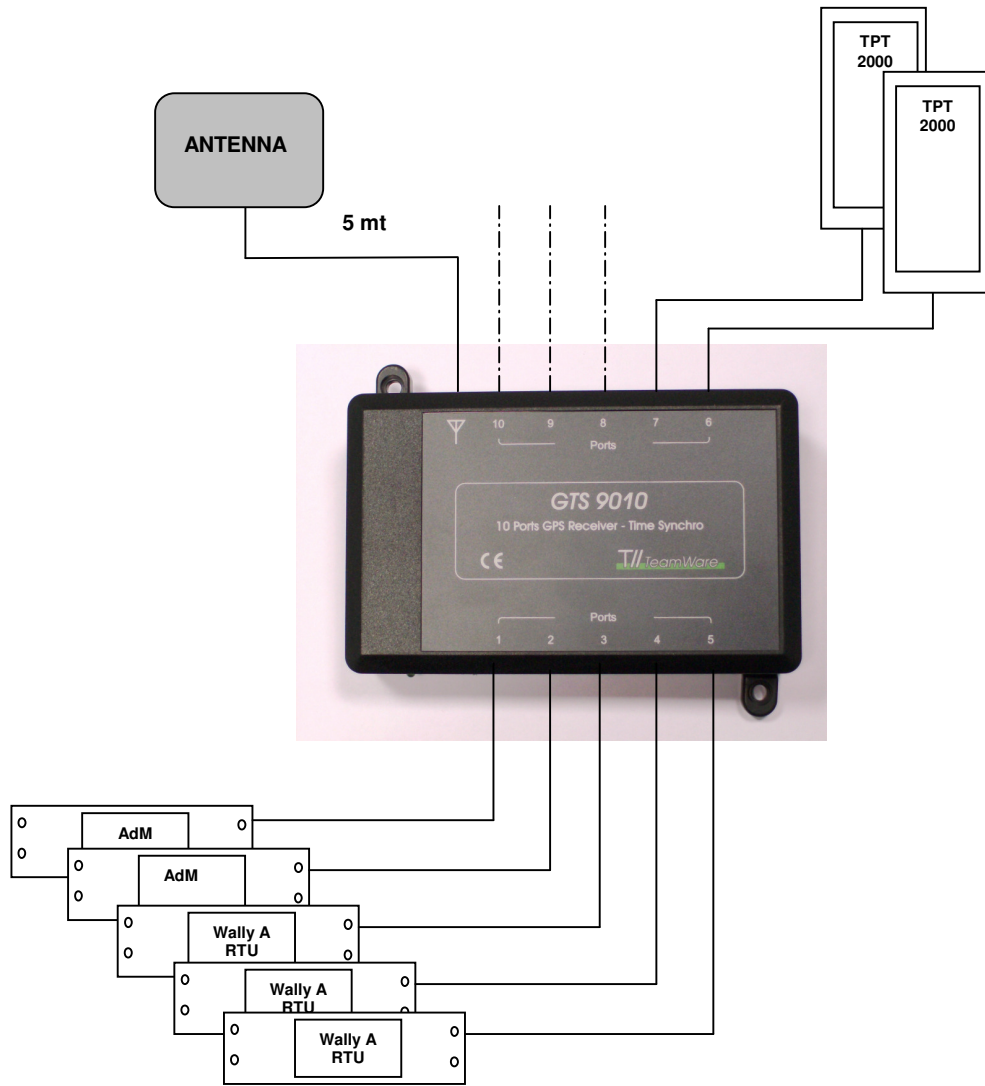
GPS Receiver wiring diagram

Antenna

The GPS antenna receives the GPS satellite signals and passes them to the receiver. Because the GPS signals are spread spectrum signals in the 1575 MHz range and do not penetrate conductive or opaque surfaces, the GPS antenna must be located outdoors in direct sky view. The GTS9000 requires an active antenna. The received GPS signals are very low power, approximately -140 dB, at the surface of the earth. The supplied active antenna includes a preamplifier that filters and amplifies the GPS signals before delivery to the receiver.

Antenna mounting

To connect antenna, push the antenna cable on the SMA-RF connector on the upper side of the box (see figure).
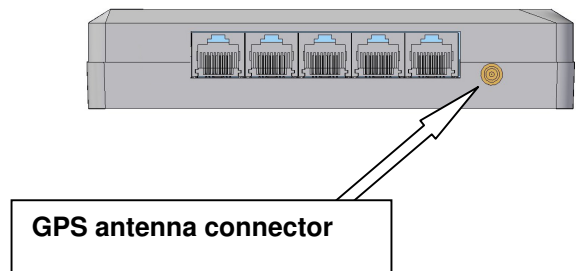
GPS antenna connector
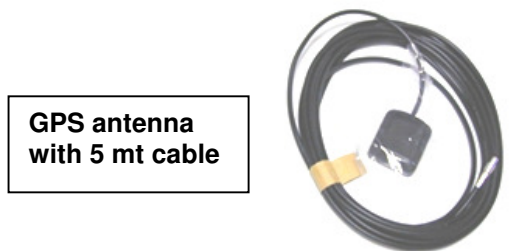
GPS antenna with 5 mt cable

Power supply

The GTS9010 receiver requires a power supply voltage between 9 and 14 Vdc, with 2 VA max consumption.
The power can be supplied directly via the RJ12 connector on pins 1 and 2 by Wally A RTU or other field devices (eg AdM).

It is possible that multiple devices supply power as long as power sources are mutually coherent or isolated.

Optionally, it is possible to supply power to the receiver with a single power source (9 ÷ 14 Vdc, 2 VA) via the external terminal connector shown in the figure.
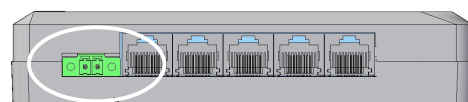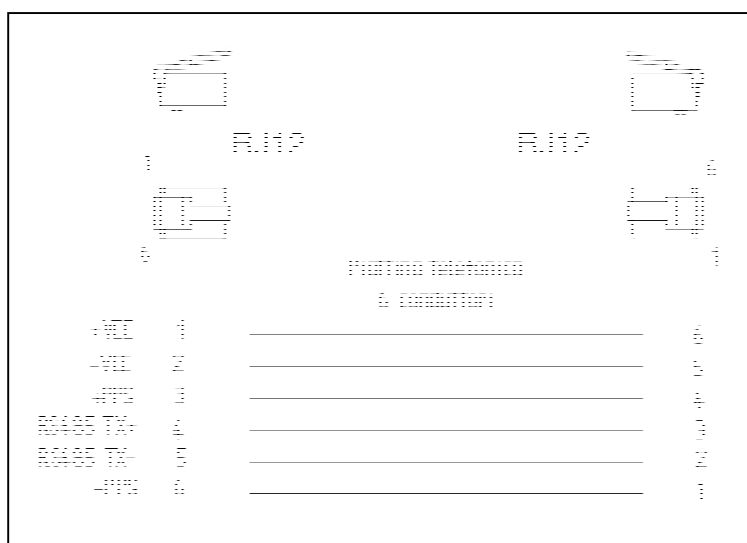

External power supply connector (optional)

Plug connectors with field devices

Each RJ12 connector for interconnection to field devices has the following pinout:

| RJ12 connector	
Pin	Descrizione
1	Vcc (9÷14 Vdc)
2	GND
3	PPS+
4	RS485 TX+
5	RS485 TX-
6	PPS-

Wiring cable WallyA-RTU - GTS9010

Serial Port default settings:

- Baud Rate: 9600
- Data Bits: 8
- Parity: None
- Stop Bits: 1

PPS (Pulse per Second) signal

A 1 second period pulse (duty cycle 350/650 ms) is available on pins 3 and 6 (isolated open collector, see figure) of each of the RJ12 connectors.

This pulse is emitted once per second with the rising edge synchronized with the UTC.

RJ12 (1÷10) connectors
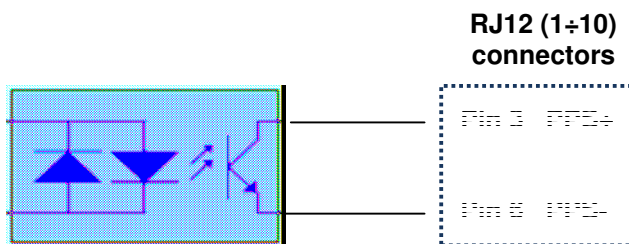
(Vmax = 24 Vdc – Imax = 30 mA)

PPS output signal

Default NMEA 0183 messages (ASCII)

On the serial line RS485, the receiver spontaneously transmits every second ASCII messages of the following NMEA 0183 protocol (speed 9600 bps):

- **GGA - GPS Fix Data**.

- **GSA - GPS DOP and active satellites**

- **GSV - GPS satellites in view**

The following example shows a sequence of message NMEA 0183 output from the receiver:

```
$GPGGA,093648.00,4531.0300,N,00913.7210,E
,1,03,3.43,00138,M,048,M,,*52
```

After power on, you need a typical time of 2 minutes for the first positional determination (fix) and issuing of the full sequence. The time to fix depends on the number of satellites in view.

Technical Specifications

- Receiver: Trimble Condor C2626 (www.trimble.com)
- Protocols: NMEA 0813
- Operating mode: GPS, DGPS
- PPS: 1 second period pulse (duty cycle 350/650 ms); open collector output, Vmax = 24 Vdc – Imax = 30mA
- Antenna: active 26dB gain, 5 mt cable, magnetic mounting
- Serial interface: RS485 with terminal block
- Serial port signals: RS485 TX+, RS485 TX-, PPS+, PPS-, Vcc, GND
- Power supply voltage: 9÷14 Vdc, 2 VA max
- Size: 143 x 90 x 30 mm
- Case: Plastic IP40
- Weight: 200 g
- Operating temperature: -20 °C to +60 °C
- Storage temperature: -20°C to +70 °C
- Standard compliance:
    Electrical Safety: CEI EN 61010/1
    EMC Immunity: CEI EN 61000-6-2
    EMC Emissions: CEI EN 61000-6-3

Special requirements and manteinance

There are no special requirements for the use of the device.
No need for preventive and / or planned maintenance.

Support and assistence

Please contact your local manufacturer indicated in the box at the bottom.

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