

syncboxRED

GPS Serial Time Source

User Manual

Version 1.2



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The syncboxRED GPS Serial Time Source is guaranteed against failure due to faulty parts or workmanship for a period of five (5) years from date of purchase.

In the event of product failure due to faulty parts or workmanship within the warranty period, World Time Solutions Limited, at its own discretion, will either (a) repair the product, (b) supply a replacement product, (c) supply a functionally equivalent replacement product, or (d) refund the purchase price of the product.

The limited warranty will not apply if (a) the product has not been installed or operated as per our instructions, (b) the product has been modified in anyway.

In the event of failure, the syncboxRED should be returned to the manufacturer for inspection and repair. Please visit our support pages for further details:

www.worldtimesolutions.com/support.html

TECHNICAL SUPPORT

To obtain help with the installation or operation of the syncboxRED, please visit our web site at:

www.worldtimesolutions.com/support.html

1 - Introduction

The World Time Solutions syncboxRED is a highly accurate GPS time receiver. The unit is designed to synchronise to the GPS navigation network and provide RS232 level serial time and date information for the synchronisation of a single system or PC.

The syncboxRED incorporates a high sensitivity GPS engine with excellent interference rejection and low noise operation, enabling the system to acquire a GPS lock in low signal areas. Please refer to section 2 for installation recommendations and section 3 for details of confirming system operation.

1.1 - Package contents

The syncboxRED is supplied with the following component parts:

- syncboxRED GPS Serial Time source
- 1m RS232 serial cable preterminated with a 9 way D connector
- UK style power adapter
- User manual

1.2 - syncboxRED front view

The drawing below shows the front view of the syncboxRED.

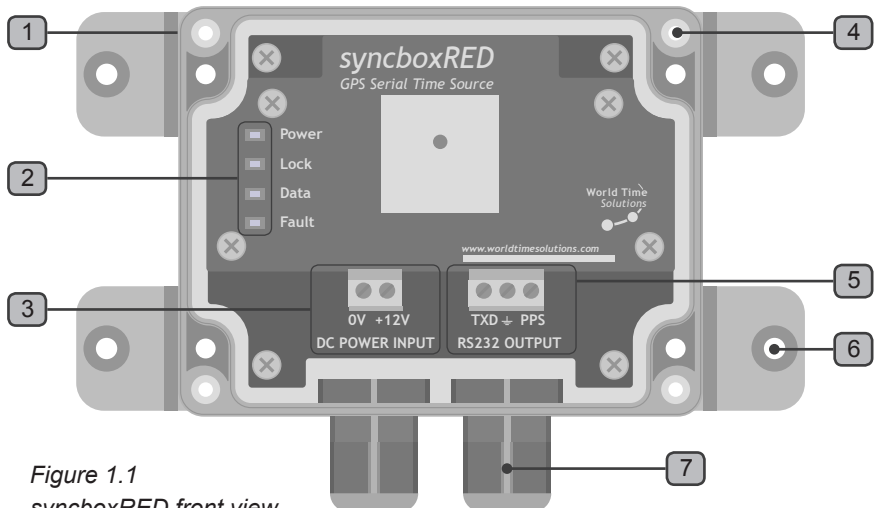


Figure 1.1
syncboxRED front view

No.	Function	No.	Function
1	IP66 (NMEA 4X) polycarbonate enclosure with clear cover	5	RS232 level serial and PPS outputs
2	Status LEDs	6	Case fixing points (x4)
3	12V DC power input	7	Cable grommets (x2)
4	Cover fixings (x4)		

Table 1.1 - syncboxRED functions

2 - Installing the syncboxRED

The syncboxRED should be installed in a suitable location following the recommendations in section 2.1 below. The system should be securely fixed in place, connected to the synchronisation slave system (e.g. a PC) using the supplied cable and then powered via the supplied power adapter.

If required, the cables may be extended by following the recommendations in sections 2.3 and 2.4. Special care should be taken to follow these recommendations if the unit is to be installed externally.

2.1 - Recommended installation locations

To achieve the most reliable operation the syncboxRED should be installed in the following optimum location:

- On the roof of a building, laying flat facing the sky. *(The unit should have a clear unobstructed view of the sky).*

If installation on the roof of the building is not practical, one of the following acceptable alternative installation locations may be used:

- Flat to the side of a building facing the horizon with a partial view of the sky. *(The unit should be installed on the side of the building facing towards the equator).*
- Mounted internally looking out of a non-obstructed window. *(The window should be on the side of the building facing towards the equator. Ensure the window is not coated with a metallised film as this may disrupt the GPS signals).*

2.2 - Physical installation

The syncboxRED should be secured in position using the four 4.5mm (0.178") case fixing points *(see figure 1.1)*. Care should be taken to ensure the fixings used (not supplied) are suitable for the application.

Alternatively, the unit may be fixed in position using the optional post fixing kit. Please refer to the instruction manual supplied with the kit for installation recommendations.

2.3 - Connecting the syncboxRED to a PC

The unit is supplied with a 1m cable preterminated with a 9 way female D connector. The connector is configured for direct connection to a standard PC 9 way male D connector, as indicated in table 2.1.

If required, the supplied data cable may be extended up to a maximum of 15m (50ft) using a similar cable type (Belden 9533 or equivalent).

Pin ID number	Connection	Cable colour
1	RS232 PPS	White
2	RS232 TXD	Red
5	SIG GND	Black

Table 2.1 - RS232 output connector wiring - (undetailed pins are unconnected)

If the unit is to be installed externally, the supplied cable should be substituted for a sunlight resistant equivalent. When replacing the cable, care should be taken to ensure that the cable grommet at the data cable exit point is fastened securely and any joints in the cable are housed within a water tight enclosure.

2.4 - Power connection

Once the unit has been secured in place and the RS232 output connected, power may be applied to the syncboxRED. The power adapter should be connected to a local mains power supply.

WARNING! ENSURE THE POWER SUPPLY IS OF THE CORRECT VOLTAGE FOR OPERATION WITH YOUR LOCAL MAINS POWER SUPPLY.

The power adapter and connected cable are suitable for internal use only. If the syncboxRED is being installed externally, a suitable DC power cable extension should be used for the duration of the external cable run. The cable extension should be selected by a suitably qualified person.

When connecting the replacement power cable, care should be taken to ensure that the cable grommet at the power cable entry point is fastened securely and any joints in the cable are housed within a water tight enclosure.

3 - System operation

Once the system has been correctly installed (*see section 2*) and the power adapter connected to the local mains power supply, the syncboxRED will automatically search for GPS signals.

For a typical installation, system lock from a cold start should take under 10 minutes. Once the syncboxRED has synchronised to the GPS satellites, the unit will automatically output RS232 data. Depending on the software version of each individual syncboxRED, RS232 data may be output before the system has synchronised to the GPS signals.

3.1 - syncboxRED status information

The operational status of the syncboxRED may be visually confirmed via the status LEDs (*see figure 1.1*). The table below lists the function of the different LEDs.

LED	Status
Power	Green LED illuminates continuously when power is applied to the syncboxRED and the system is running
Lock	Green LED illuminates continuously when the syncboxRED is synchronised to the GPS satellites
Data	Green LED flashes to indicate communication between the GPS engine and the main processor
Fault	Red LED illuminates upon detection of a fault condition

Table 3.1 - Status LEDs

3.2 - Serial data format

The syncboxRED is available with different software versions, each generating an RS232 level serial output in a different data format. The output data is specified by the customer at time of order. This syncboxRED has been supplied to output the following serial format:

A - Specifications

Typical Performance Specifications:	
PPS accuracy:	1 microsecond

GPS Module Specifications:	
GPS engine:	12 parallel channel C/A L 1 (1575.42 MHz)
RF Reception Sensitivity:	-189dBW tracking, -185dBW acquisition (hot or assisted, Ephemeris available), -174dBW unassisted acquisition (Ephemeris decoded)

I/O Connections:	
Serial ASCII output:	RS232 level serial data output (as detailed in section 3.2)
PPS output:	RS232 level one pulse per second output
Power input:	12 VDC power input, supplied with 230 VAC power adapter

Mechanical & Electrical Specifications:	
Dimensions:	158 x 90 x 55 mm (6.22" x 3.54" x 2.17") (including removable wall brackets, excluding cable grommets)
Weight:	1 kg
Enclosure:	IP66 / NEMA 4X rated, UV stabilised polycarbonate enclosure. Light grey body and clear cover.

Environmental Specifications:	
Operating temperature:	-30 to +50 °C
Relative humidity:	0% - 95%, noncondensing

Standards Compliance:	
Electrical Safety:	BS EN 60950-1:2006
Radio Disturbance:	BS EN 55022:2006
Immunity Characteristics:	BS EN 55024:2003

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