



488HS GPS Receiver System

The Wharton® 488HS GPS receiver system has been designed to allow 4850 and 4860 series master clocks to be automatically synchronised from the GPS satellite time transmissions. This provides a highly accurate source of time regardless of global location.

The 488HS GPS receiver system is housed in a single IP66 rated case containing both the active antenna module and the receiver/decoder interface. The IP66 rated protective housing shields the 488HS GPS receiver system from wind, rain and snow.

The gain pattern of the antenna is designed for full upper hemispherical coverage with the gain diminishing at low elevations. This cross-section is consistent through 360 degrees and so the 3-dimensional gain pattern is a symmetrical spheroid surface.

The 488HS GPS receiver system should be horizontally mounted with a clear view of 75% of the sky. If the sky view is reduced, the interval between 'switch-on' and system time synchronisation will be considerably increased.

A post mounting clamp is supplied to enable the antenna to be fixed to a suitable horizontal or vertical post of up to 20mm diameter. The antenna may be mounted on the roof of a building or under a suitable skylight.

To ensure ease of operation and to remove the possibility of operator error the 488HS GPS system is designed to self initialise without the necessity of operator data input. On power-up the receiver will automatically begin to search the sky for all available satellites. After three satellites have been acquired a precise date and time will be calculated from the satellite data transmissions.

When the accurate satellite time information is available synchronising time signals are transmitted from the receiver/decoder module to the 4850/4860 master clock.

The connection between the 488HS GPS synchronisation system and the 4850/4860 master clock is by a four core screened twisted pair cable up to 200m long. This cable also provides power to the receiver/decoder module.

When the 4860 master clock is synchronised with the GPS receiver/decoder module all transmitted signals are accurate to within +/- 50uS.

What is GPS?

GPS is a system of satellites in six orbits, each orbital plane equally spaced about the equator and inclined at 55 degrees. The satellites transmit highly accurate, realtime, worldwide navigation information at a frequency of 1575.42 MHz that anyone with a suitable GPS receiver can use to identify their position, together with a precise local time.

The GPS system was developed by the US government initially for military use and is now available for unlimited commercial access.

How GPS works

GPS satellites travel in nearly circular orbits every 12 hours at an altitude of 20,200km (10,900 nautical miles). The exact position of each satellite can be determined at all times. Each satellite continuously transmits a unique code sequence, derived from atomic clocks, which is tracked by the GPS receiver.

The transmitted information includes current orbital data for each satellite. The GPS receiver is able to identify each satellite by its code and is able to calculate the satellite's exact position in space.

The GPS receiver uses the calculated information to determine its distance from several satellites. The receiver then uses a process called triangulation to compute its own position together with a precise local time.

488HS GPS Synchronisation System



Specification

Operating temperature:

-25°C to +45°C (ambient)

Weight:

300g (excluding cable)

Physical Dimensions:

85mm x 58mm x 93.5mm (including bracket)

Electrical Connections:

System supplied with a captive 25 metre length of 4-core 7/0.2 (0.22mm²) screened cable. For distances of up to 50 metres, the length can be extended by adding an additional length of 7/0.2 cable. For greater distances, up to a maximum of 200 metres, 16/0.2 (0.5mm²) cable should be used.

Receiver Architecture:

12 channel - capable of tracking 12 satellite vehicles simultaneously.

Time to first fix - typically less than 10 minutes from cold start.

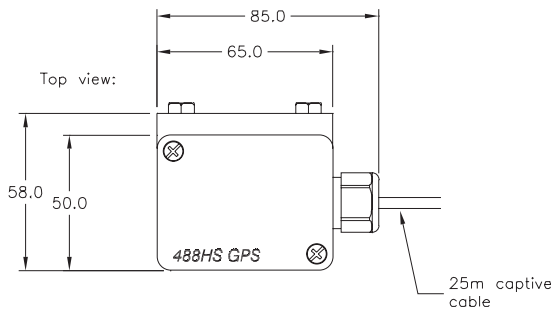
Accuracy:

+/-50uS - 4860 Master Clock outputs

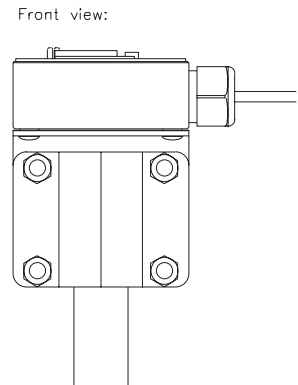
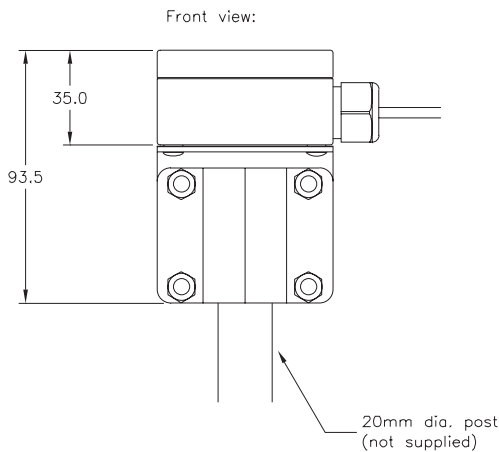
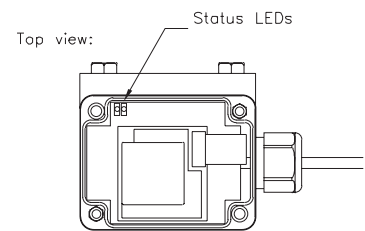
MTBF:

> 50,000 hours

Assembled view of 488HS:



View of 488HS showing internal detail:



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