

Data Acquisition Products

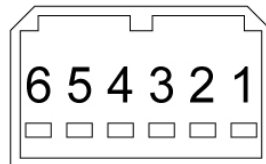
Non-Contact Speed Sensor

GPSTran operation

The GPSTran is designed to provide a vehicle speed signal to telematic or other equipment. The non-contact method of operation allows measurement of speed in applications where use of traditional speed sensors is not possible. Output is in digital pulse form with a frequency directly proportional to velocity. The velocity data is derived from Doppler measurement of GPS satellite carrier signals. This Doppler measurement ensures an accuracy of within 0.1 Km/h (0.0625Mph) when an open sky view is available. Operational status is indicated through a tri-colour led. A recessed push-button switch is housed on the rear of the unit to initiate a GPS cold start after installation.



Main Connector



Mating connector
AMP / Tyco 175507-2
Contact terminals 175062 or 345160

Main Connector (Type AMP Multilock 040)

Pin	I/O	Function	Wire Colour
1	I	Ground	Black
2	I	+8V to +40V Power. Ignition switched feed. Approx 130mA Fit in-line 200mA fuse !	Red
3	O	Speed Pulse (0 to Vpower)	Orange
4	O	Reserved	
5	O	RS232 Tx (Configuration only)	
6	I	RS232 Rx (Configuration only)	

GPS Antenna (Type SMA)

Pin	Function
Center	Signal / Active antenna bias +5vDC
Shield	Ground

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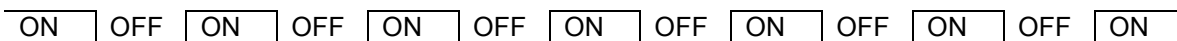
Inputs		Details
Power	+8V to +40V Power	Ignition switched feed. Approx 130mA Fit in-line 200mA fuse !
GPS Antenna	SMA Connector	
Cold Start	Push button switch	Press and hold for approx 5 seconds until LED turns to orange then release
Test Output	Push button switch	Pressing for < 4 seconds will force 100Km/h test signal on output
Outputs		
Speed	Pulse Per Metre	User adjustable (Default 10ppm) Range from 0.1 to 100pulse per meter
Led status	Green*	Power on / Operation OK
	Red*	Power on / Low satellite count
	Amber	Power on / Cold start active
	No light	Power off

*Pulses to indicate GPS communication

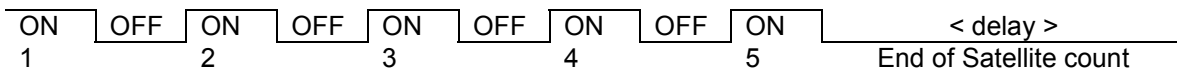
Cold Start Procedure

When the GPSTran is first fitted it is important to perform a cold start of the internal GPS system. This instructs the GPS receiver to refresh all satellite position data held in its memory. To initiate the cold start, first connect the antenna to the GPSTran. Then ensure that the GPSTran is powered and that the GPS antenna has an un-obstructed view of the sky. Using a pen or other suitable point, carefully press and hold the push button switch on the rear of the unit for approximately 5 seconds until the LED indicator turns to orange and then release it. After a short period the LED will start to flash red to indicate satellite communication. When enough satellites are discovered to enable operation, the LED will change to flashing green. The GPSTran should then be left powered for at least 30 minutes to enable it to download new satellite position data from the GPS satellites.

Constant RED flashing = No Satellite signal



Flashing with a delay = Number of satellites in view*



* When a satellite count is flashing, the LED will be RED if the current sat count is insufficient for correct operation. It will turn to Green when enough satellites are tracked for correct operation.

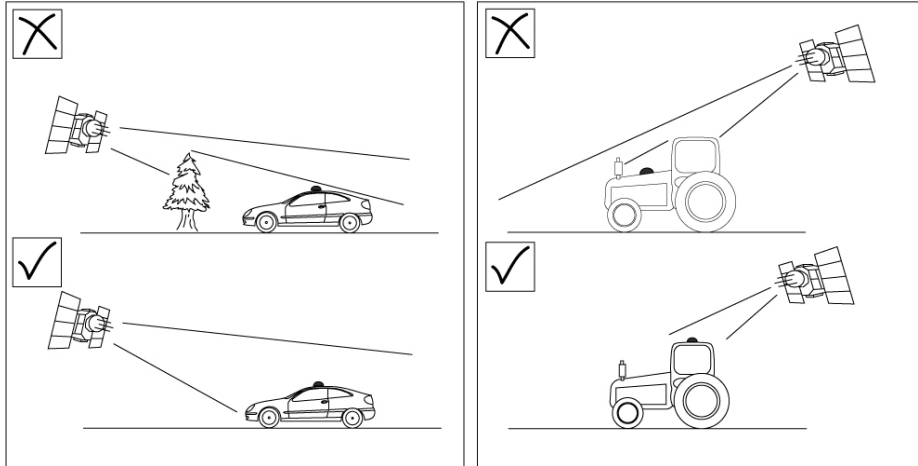
Test Output

The GPSTran also features a test facility. When the switch is pressed, the GPSTran speed output will be forced to the 100Km/h value. For the default 10pulse/meter setting this corresponds to an output frequency of approximately 278Hz (100Km/h = 27.78m/s). This can be used to verify any user adjustment of the PPM value.

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Antenna position

It is important that the GPS antenna is positioned with an un-obstructed view of the sky to receive optimum satellite coverage. The antenna should be ideally mounted on a high point of the vehicle away from other antennas.



Changes to Calibration settings using HyperTerminal

It is possible to make changes to the settings in the GPSTran using HyperTerminal or a similar terminal program. The connections for making a configuration lead are shown at the end of this manual. Alternatively, a configuration lead is available for purchase from Racelogic.

Terminal settings

19200,N,8,1

Key commands

Key (parameter)	Response
S	Read out settings. This will cause the GPSTran to display the currently stored settings. For example:- PPM_ 10.0000 MSPD 1 SLIM 20 FILT 1 TYPE 1
P (PPM_)	Modify Pulse Per Meter (PPM) setting Eg; type:- P0.36 [enter] to set pulse per meter to 0.36
G (TYPE)	Modify Speed source setting. Default = 1 0=3D-Speed 1=2D-Speed (Speed over Ground) Eg; type:- G1 [enter] to set speed over ground
M (MSPD)	Modify minimum operational speed setting Eg; type:- M27 [enter] to set minimum speed to 27cm/s (1km/h)
A (SLIM)	Modify satellite count threshold setting (3 to 12) Eg; type:- A5 [enter] to inhibit output when satellite count is less than 4
F (FILT)	Modify filter setting Eg; type:- F8 [enter] to set 8 sample moving average

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Explanation of terms

- PPM_** Pulse Per Meter setting.
- MSPD** Minimum speed in cm/s for output to occur.
- SLIM** Satellite count limit for valid output. This is a satellite threshold for GPS accuracy. If the GPS signal is degraded by reflections and obstructions caused by things like trees or buildings, the number of satellites in view of the antenna will decrease. When satellites are being tracked by the GPSTran, the LED will flash the number of satellites followed by a delay to mark the end of the count. If the number of satellites tracked is equal to or above the SLIM value (default 4) then the GPSTran will output a value speed signal when moving and the LED will flash green. If the number of tracked satellites is below the SLIM value then the speed pulse output will be inhibited and the LED will flash red.
- FILT** Filter level. Range 0 to 8 where 0 is no filter and 8 is an 8 point moving average filter.
- TYPE** The TYPE setting can be set to 0 or 1 to determine the speed capture mode of the GPSTran. When set to 1 (default) the GPSTran speed output will correspond to speed over ground. This does not take into account vertical speed. When set to 0 then speed output corresponds to 3-dimensional speed, taking into account vertical movement.

Default settings

Pulse PerMeter	10.0000
Minimum speed	27 cm/s (approx 1Km/h)
SLIM	4 sats ie; ignore GPS speed data unless 4 or more Satellites in view.
FILT	1 = No filtering
TYPE	1 = Speed Over Ground

Configuration lead connections

