



# RPR 100S

## Installation and Service Manual



\*Congratulations on your purchase of the Raven RPR 100S GPS Receiver. This compact, all in one unit, will provide you with the ability to log data and provide speed to your Raven controller. This receiver should not be used for guidance systems, since it is only a 1 Hz receiver. Setup is fast and easy and can have you in the field within a half hour, in most cases. This simple document will assist you in installing your 100S.

#### Installation Steps:

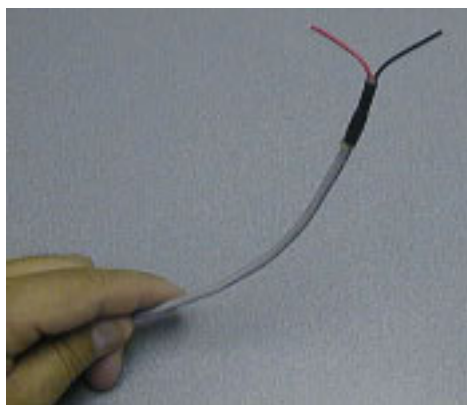
- 1) Unpack the components from your box. Verify that you have the receiver unit P/N 063-0172-366 and the cable P/N 115-0171-350.



- 2) Attach the cable to the Antenna.



- 3) Locate a metal surface on the vehicle that is toward the center and in clear view of the sky. Place the antenna to that surface.
- 4) Connect the power and ground wires. Red to +12VDC and Black to ground.



**NOTE:** It is recommended to attach these directly to a battery to eliminate any signal noise issues.

- 5) Make sure the vehicle has a clear view of the sky. Allow the RPR 100S about 15 minutes to acquire all of the satellite information.

### Initial start-up

Both the internal GPS and WAAS receiver must perform a COLD START the first time the system is powered up. The GPS receiver will search the sky for satellites and download data necessary for operation. The WAAS receiver will wait until the required almanac data is received. The cold start will take up to 15 minutes but is only required during the initial power up. Connect the serial cable provided between the RPR 100S and the computer and apply power. Turn off all unnecessary electrical equipment to minimize electrical noise interference. Upon completion of the initial "cold start", the receiver begins to operate in "normal mode". The unit should be operating in full DGPS mode within a few minutes of power up, after the almanac has been established during the cold start.

All configuration and WAAS data is stored in nonvolatile memory inside the RPR 100S. Configuration changes are made with utility software. Be aware of possible satellite obstructions, which may interfere with GPS operation.

- 6) Plug in the receiver's 9 pin connector to the data logging device. Note that you may have to contact the vendor of your hardware for any specific cable needs to adapt to the 9 pin RS232 connector. The settings for the data stream is GGA and VTG at 1Hz and a baud rate of 4800 bps.



- 7) If using a Raven controller, attach the speed connector to the rear of the console, program the console in SP2 and put in a SPEED CAL number of 785.  
**NOTE:** If using a non-Raven controller, an adapter cable will be required.



## **GPS ANTENNA**

GPS is a line of sight system, which means in order for the receiver to track the satellite, there must be unobstructed path directly to them. Buildings, trees, machinery, and human bodies are common obstructions. When locating the antenna/receiver, find a place where the antenna will have an unobstructed view of the sky. Items such as electrical motors, generators, alternators, strobe lights, radio transmitters, cellular phones, microwave dishes, radar, active antennas, etc., all generate electrical and magnetic fields which can interfere with the GPS or WAAS signal. Mount the Antenna/receiver away from such potential sources of interference. The GPS can be de-tuned by close proximity to other objects. For example, if you place the antenna under fiberglass, its performance could be degraded. Usually, if the antenna/receiver is lowered so that at least a quarter of an inch gap is made between the antenna/receiver and the covering plastic or fiberglass, acceptable performance can be achieved. Metal or other dense materials will completely block the GPS signals.

## **RADAR OUT**

The receivers can simulate a Doppler radar commonly used on agricultural equipment for detecting speed. The GPS receiver is always calculating speed and can generate the signals, which can be used by equipment requiring RADAR input. The receiver is normally configured at the factory for RADAR output. To use this feature, a special cable from RAVEN will be needed if using a Raven controller. It should be noted that the GPS can only determine speed when it is navigating. If a tree line blocks too many satellites or if for some other reason the receiver is unable to navigate, then the RADAR output could become invalid. The scaling factors and timing controls that govern the operation of this feature can be controlled via a serial configuration message as defined in the serial Protocol Definition document. The receivers default settings are: GGA and VTG at 1Hz and a baud rate at 4800bps.

### **PHYSICAL CHARACTERISTICS:**

- ◆ Size: 5.5" H x 5.0" x 2.1" D
- ◆ Weight: Less than 12 ounces (<340g)
- ◆ Power consumption
  - ◆ Power requirements: 9-16 VDC
  - ◆ Power consumption: <200 mA
- ◆ Connectors
  - ◆ 7 pin, circular, RS232 serial ports

### **ENVIRONMENTAL/OPERATING CONDITIONS**

- ◆ Operating Temperature: -40° to + 85° C (-40° to + 185° F)
- ◆ Relative Humidity: 99% non-condensing
- ◆ Altitude: 60,000 feet
- ◆ Maximum velocity: 1000 knots
- ◆ Acceleration: 4 G

### **STANDARD FEATURES**

- ◆ Integrated GPS WAAS receiver and antenna
- ◆ Small and lightweight with rugged, waterproof enclosure
- ◆ 2 meter differential GPS accuracy
- ◆ 10 channel GPS, L1, C/A code
- ◆ Superior weak signal tracking
- ◆ Position solutions at 1 per second
- ◆ Multiple mounting configurations
- ◆ Free Software upgrades via Internet
- ◆ Best technical support in the industry featuring 1 year warranty
- ◆ EP455 Electrical Compliant with load dump protection
- ◆ RADAR (ARPA) speed log output

### **TECHNICAL SPECIFICATIONS**

- ◆ 10 parallel channels; tracks up to 10 satellites, 1 WAAS
- ◆ 1 Hz position updates
- ◆ Differential accuracy 2 meter horizontal RMS
- ◆ NMEA version 2.2 protocol: GGA, GLL, GSA, GSV, VTG, ZDA
- ◆ Acquisition Time
  - ◆ Re-Acquisition: 100 mS
  - ◆ Cold start: 15 minutes