

# Installation Instructions – GPSD[C], SHK[G] & FINDC Series

SW3-735 V2.0

## A Introduction

The MiMo Sharkee OEM style antenna is available in a number of variants. GPSD/SHK[G] series is multi-function with 2x2 MiMo for 4G/LTE, incorporates an active GPS/GNSS antenna with 26dB gain LNA and the GPSD version has a M6 stud (under a blanking cover) for an optional comms whip. In addition, a version is available which includes 2x2 MiMo (and in the case of SHK[G] 3x3) dual band WiFi antennas. GPSDC series features an SMA socket, in place of the M6 stud, which enables a coaxially fed antenna to be fitted. The FINDC is as per the GPSDC type, but does not include the GPS/GNSS function. This antenna is suitable for fitment to vehicle panels of up to 8mm (0.31"). Heat shrink tubes are included in the kit, to enable the coaxial connections to be sealed as an extra precaution if required.



### Electrical Safety Note

The GPSD, SHK[G] & GPSDC contain an active GPS/GNSS antenna (part number SR8-HG26).  
Rated voltage: 3-5VDC Rated current: 20mA maximum

**The supply to this device must be provided with overcurrent protection of 1A maximum.**

## B. Mounting requirements and selecting location

For optimum performance, it is recommended that the antenna is fitted on a conductive (metal) panel. For GPSD version, if a whip will not be fitted, and for GPSDC, SHK[G] and FINDC types, it is possible to mount the antenna on a non-conductive panel with acceptable performance for all the antenna functions. For GPSD type, if a whip is to be used, then the antenna must be fitted on a conductive ground plane - recommended size is  $\frac{1}{2}$  wave length diameter at the lowest frequency of whip operation. To calculate this size, use formula below:

$$150 / \text{frequency in MHz} = \frac{1}{2} \text{ wavelength (m)}$$

Examples: 150MHz = 100cm (39.4"); 400MHz = 38cm (15"); 900MHz = 16cms (6.3").

When fitting on a non-metallic panel, a ground plane plate of suitable size should be fabricated and fitted under the mounting panel; the earthing washer must make low resistance electrical contact with this plate ( $<0.2\Omega$ ). Select a mounting location, checking for roof curvature to ensure that the antenna base will have a flat mounting surface. The antenna should be located as far as possible from surrounding roof mounted items (e.g light bar, air con unit). Ensure that there is adequate under panel clearance and that there is no double skin panel or cross brace present. Measure to check for central position if applicable.



### Important Note Regarding Sealing

In order to ensure that the installation is properly sealed against the mounting surface care must be taken regarding curvature of the mounting panel. It is highly recommended to install the antenna on a clean, flat and level surface. After installation the compression of the rubber boot against the mounting panel should be checked and a small bead of neutral cure silicone sealant can be applied around the periphery of the mounting boot if required.

## C. Prepare and drill hole



Fig.1



Mask panel area around hole position to protect paintwork and headliner. Drill a pilot hole, and then increase to 19mm (3/4"), ensuring that drill/cutter bit does not contact headliner. Clean area around the hole, carefully removing all swarf.

Remove paint and primer from under panel surface to ensure adequate earth contact by washer and nut. Apply some petroleum jelly or paint around the hole to prevent corrosion.

## D. Fitting the antenna

Remove protective backing from underside of antenna, feed coaxial cables through panel. Position the antenna over the hole ensuring correct orientation and stick to panel by applying firm downward pressure. It may be advisable to apply a very small amount of neutral cure silicone sealant around the base of the mounting boot to overcome friction and allow the boot to fully compress against the mounting panel

Caution – A slotted/split nut is provided in order to simplify fitting it over the coaxial cables. When fitting the nut, it is important to ensure that the cables are held centrally whilst the nut is correctly started on the threads. The nut should fit freely by hand and only require a final tighten by spanner.

Assemble the nut and washer from underside and tighten to recommended torque of 5Nm.

Remove blanking cap and screw comms antenna whip securely to mounting stud (where used).

## E. Routing and terminating coaxial cable(s)

If heat shrink tubes are to be used, slide onto antenna cable tails prior to connecting extension cables – it is recommended that these are heat shrunk only after tests have been satisfactorily completed. Connect extension coaxial cables to antenna and route to equipment. Fit correct coaxial connector or adapter to cables as required.



When routing the cables take care to avoid running them adjacent to any existing vehicle wiring or fouling any moving vehicle components. The cables must not be routed in front of any airbag device.

## F. Commission and test

### Check GPS/GNSS cable (where applicable):

- Check the GPS/GNSS cable with DC to measure high resistance.
- Connect the GPS / GNSS cable to the GPS/ GNSS receiver and check for satellite acquisition.

### Check comms cable(s)

- Earth continuity: connector body to vehicle ground should measure  $<0.2\Omega$ ;
- Connector body to centre pin should measure open circuit.
- Carry out VSWR check, should measure  $<2.5:1$  in transmit band (antenna type dependent).
- Connect Cellular/ LTE & WLAN cables or stow unused pigtailed.

## G. Notices



### CAUTION

To comply with FCC RF Exposure requirements in section 1.1310 of the FCC Rules, antennas used with this device must be installed to provide a separation distance of at least 20 cm from all persons to satisfy RF exposure compliance.



### DO NOT

- operate the transmitter when someone is within 20 cm of the antenna.
- operate the equipment in an explosive atmosphere.



### European Waste Electronic Equipment Directive 2002/96/EC

Please ensure that your old Waste Electricals and Electronics are recycled do not throw them away into standard waste.



### Directive 2011/65/EU (RoHS 2)

This product is fully compliant with the RoHS 2 Directive - Exemption 6.c is applied.

### Directive 2014/53/EU Radio Equipment Directive (RED)

Harmonised Standards and References:

EN 301 489-1 (V2.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Electro Magnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements".

Referencing EN 61000-4-2:2009 – Electrostatic Discharge Immunity and EN 61000-4-3:2006 +A1:2008 +A2:2010 – Radiated RF Immunity

**EN 300 440-1 V1.6.1 (2010-08)** – Electromagnetic compatibility and radio spectrum matters (ERM); short range devices; radio equipment to be used in the 1GHz to 40GHz frequency range; Part 1: Technical characteristics and Test methods in accordance with EN 300 440-2 V1.4.1 (2010-8) - Electromagnetic compatibility and radio spectrum matters (ERM); short range devices; radio equipment to be used in the 1GHz to 40GHz frequency range

**Low Voltage Directive: Directive 2014/35/EU** (Electrical Equipment designed for use within certain voltage limits) of 26th February 2014.

**EN60950-1:** Safety of information technology equipment – according to test specification EN 60950-1:2006+A2:2013

**Waiver:** This document represents information compiled to the best of our present knowledge. It is not intended to as a representation or warranty of fitness of the products described for any particular purpose. This document details guidelines for general information purposes only. Always seek specialist advice when planning installations and ensure that antennas are always installed by a properly qualified installer in compliance with local laws and regulations.