

Installing The PilotAware Installation Kit Internal Antennas October 2020.

PilotAware was initially developed as carry on equipment to be carried onto all types, EASA, C of A and permit aircraft. However, a permanent or semi- permanent installation is a much better installation for the following reasons.

- Antenna location is optimised for better transmission and reception of the 1090MHz and 869.5 MHz frequencies that are used by PilotAware.
- Optimum antenna location reduces Obscuration due to Airframe, occupants and fluids which all degrade or block signals
- GPS antenna location is optimised for maximum satellite signals and strength.
- The main PilotAware unit is located out of sight anywhere on the aircraft for convenience.
- A permanent power supply is connected so that PilotAware will commence its boot up process as soon as the master switch is thrown.
- There are no cables showing and the installation will be neatly out of the way.
- PilotAware will run cooler away from the solar gain of the dashboard top.

INSTALLING EQUIPMENT IN YOUR AIRCRAFT IS A SPECIALISED OPERATION. IF YOU DO NOT FEEL COMPETENT IN DOING THIS PLEASE CONSULT A QUALIFIED ENGINEER. THESE GENERIC INSTALLATION INSTRUCTIONS ARE FOR INFORMATION ONLY BUT MAY PROVIDE ERRORS. IT IS UP TO YOU AS PILOT IN CHARGE TO ENSURE THAT THE INSTALLATION IS FIT FOR PURPOSE AND SAFE OPERATION. THIS INSTALLATION KIT IS NOT CS-STAN APPROVED.

Installation Kit 3 Contents

- 1 off 869.5MHz dipole antenna connected with 2 metres of coaxial cable (The longer one)
- 1 off 1090MHz dipole antenna connected with 2 metres of coaxial cable (The shorter one)
- 1 off Remote GPS antenna with 2 metres of cable
- 1 off Anker Cigarette Lighter Power Supply
- 1 off 12V Power Socket.
- Cable ties.
- Downloadable Installation instructions†

†Please note that if you are installing using an existing PilotAware Classic unit rather than a PilotAware Rosetta you will need to add an SMA to MCX converter or pigtail to connect to the existing RTLSDR receiver. The image below shows the installation kit connected to a Rosetta unit.



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Assembling the Rosetta Core Unit with the remote antennas and remote GPS.

Before you install the PilotAware with internal Antennas into your aircraft you may want to check that it is working correctly. To do this please assemble the parts as in the diagram above ensuring that the antenna with the shorter arms is connected to the right hand SMA connector (1090MHz used for ADSB and Modes C/S reception) and the antenna with the longer arms is connected to the left hand SMA connector (869.525Hz used for PilotAware and ATOM GRID transmission and reception).

The GPS mouse USB connector should be connected to the PilotAware Rosetta Core unit by sliding off the end cap and inserting it into the top left hand USB socket. At the same time ensure that the ADSB RTL-SDR dongle which is connected to the orange pigtail is securely fitted into the bottom right hand USB slot.

Connect the Rosetta thus assembled to a suitable USB source 5.2V 2.1A using the power lead provided.

Installation in your Aircraft

The Rosetta, unit should be installed hidden conveniently in the aircraft (behind the dashboard, under the seat, in the glove compartment etc) but with local access to:

1. 5.2V, 1.2A power (using the standard 1 meter lead to minimise volt drop)
2. the remote antennas connected to 2 metres of coaxial cable.
3. the remote GPS and the intercom or headsets if required. (The 3.5mm audio cable is not supplied as cable lengths will vary between installations).

Rosetta should be attached using the tie wraps provided or by any other preferable means. There is a ¼ inch screw thread in the Rosetta case which may be useful for securing the unit, but do not screw in too tightly or too deep.

Installing the GPS antenna.

Firstly, the GPS antenna should be located so that it has a full view of the sky. This is usually on the dashboard. It can be in other locations but be aware that the GPS signals will be attenuated (weakened) by metal, water (human bodies) or carbon fibre. The GPS supplied is not weather proof and therefore unsuitable for external mounting if the aircraft is expected to get wet. Find a suitable location and drill or cut a slot for the GPS cable USB connector to pass through the dashboard for onwards cable dressing to where the Rosetta unit is to be mounted. 2 metres of cable is supplied with the remote GPS for this to be accomplished. The GPS USB connector can be connected into any one of the 4 USB slots accessible from the slide off panel in the end of the Rosetta unit. However by convention this is usually located in the top left hand USB socket.

Installing the Radio Antennas.

Both centre feed horn antennas used in the internal installation kit (long= 869.5MHz and Short = 1090MHz) are installed in a similar way. The antennas are 'Dipole Antennas' and therefore are self-contained and do not need a ground plane. The antennas should be mounted **vertically** in your aircraft so that they have a good view of the sky. Either side of the windscreen is good, on the side windows or above and behind the occupants on a tube and fabric or fibreglass aircraft that will provide less airframe obscuration than a metal structure. Suckers are provided to affix the antennas to windcreens if required.

Positioning of the antennas will be different from aircraft type to aircraft type and is subject to avoiding the mass of the engine or the water in the bodies of the occupants to avoid unnecessary attenuation. The antennas should ideally be a minimum of 150mm away from other antennas and as far away as possible for best operation.

Connect the antennas to the Rosetta unit making sure that the longer antenna is connected to the 869.525MHz SMA connector (LHS when viewed from the front of the Rosetta unit) and that the shorter antenna is connected to the 1090MHz SMA connector (RHS when viewed from the front of the Rosetta unit). If these are reversed, then transmission and reception will be impaired as the antennas are tuned for the individual frequencies

Connecting the Power Supply.

It is most important that the power cable supplied with the Classic or Rosetta Unit is used in the installation. Avoid runs longer than 1 metre between the Rosetta unit and the Anker power supply. Included in the installation kit is an Anker Cigarette lighter charger which has been shown to provide an excellent inexpensive noise free USB supply for PilotAware. A Cigarette lighter socket is also provided. This should be cabled to the switched 12V supply of your aircraft via a suitable fuse or circuit breaker. PilotAware will draw a max of 2.1 amps at 5.2V from the ANKER charger which translates to less than 1A from the 12V supply. A 2A fuse will suffice. Cable and fuses are not supplied as these will be bespoke to the installation and type of aircraft in which it is fitted. It is recommended that low smoke and fume cable is used to connect to the 12V supply.

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The Anker Charger will be a secure fit in the cigarette lighter socket. A cable tie can be used for greater security. The assembly should be cable tied in a suitable location, securely but not too tight. With this installation, the PilotAware will boot up when the master switch is operated. ENSURE THAT THERE IS ELECTRICAL FIDELITY AND THAT ALL CONTACTS ARE INSULATED. If you do not feel confident to do this yourself get a qualified engineer to do this for you. Alternatively, you could use a Charge 2 Charge 4 EASA approved USB power supply. The latter being suitable for 24V, as well as 12V systems.

Additional Information. Good Engineering Practise.

- (1) Use low smoke and fume cable where possible.
- (2) The WiFi signal can be increased to 100mW if required. This is done on the Network Page of the PilotAware Web pages via 192.168.1.1
- (3) Affix the PilotAware unit using Velcro and cable ties so the unit is secure but not too tight.
- (4) Crimp don't solder
- (5) Don't run cables parallel for too long to avoid induction.

Every installation will be different. If you need help don't forget to visit the PilotAware Forum forum.pilotaware.com where there will be advice from fellow pilots who will have possibly installed PilotAware in aircraft. Also, reciprocate if you have done a successful installation and add to the knowledge. For the full PilotAware operating instructions please visit pilotaware.com.