PilotAware Installation Kit 3 Internal Antennas Aug 2018.

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 can be optimised for better transmission and reception of the 1090MHz and 869.5 MHz frequencies that are used by PilotAware.
- GPS antenna location can be optimised for maximum satellite signals and strength.
- The main PilotAware unit can be located out of sight anywhere on the aircraft for convenience.
- A permanent power supply can be 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 heat 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 AND PROVIDED IN GOOD FAITH 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 long one)
- 1 off 1090Mhz dipole antenna connected with 2 metres of coaxial cable (The short one)
- 1 off Remote GPS antenna.
- 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.

Removing Parts from the Rosetta Unit.

Using the standard PilotAware Rosetta you need to firstly remove the two black antennas connected to the gold SMA connectors. Then remove the GPS PCB dongle attached to the USB socket. The GPS dongle is located under the slide off panel at the end of the Rosetta unit and is the one that does not have a pigtail connected to it. **These 3 items are replaced with external units and not used in the installation** so can be set aside if Rosetta is to be used in another aircraft.

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The Rosetta, or Classic unit should be installed hidden conveniently in the aircraft 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 is 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. 3 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.

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. Suckers are provided to affix to windscreens 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. Information on locating antennas, is provided at http://www.pilotaware.com/wp-content/uploads/2016/10/PilotAware-Antennas.pdf 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 869.5Mhz 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

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 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 https://pilotaware.com/wp-content/uploads/2018/08/180520-Operating-Instructions-.pdf

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