

## Introduction;

PilotAware was initially developed as portable equipment to be carried onto all types of aircraft, EASA, C of A and permit.

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.*

## Rosetta + Installation kit (External Antenna Bundle);

- 1 x PilotAware Rosetta core
- 1 x 869.5MHz antenna (The longer one) with internal BNC connector.
- 1 x 1090Mhz antenna (The shorter one) with internal BNC connector.
- 2 x 2metre LM240 low loss coaxial cable with BNC-SMA connectors.
- 1 x Remote GPS antenna.
- 1 x Anker 12V Power Supply
- 1 x 12V Power Socket.
- Cable ties.
- Downloadable Installation instructions†

## Installing the PilotAware Installation Kit External Antennas October 2020.

The following image shows the contents of the PilotAware Rosetta external antenna bundle.



## Assembling the bundle;

Before you install the PilotAware 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 shorter antenna is connected to the right-hand SMA connector (1090MHz used for ADSB and Modes C/S reception) and the longer antenna is connected to the left-hand SMA connector (869.525Hz used for PilotAware and ATOM GRID transmission and reception).



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

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 bottom left hand USB socket. At the same time ensure that the 1090 SDR USB (connected to the orange pigtail) is securely fitted into the bottom right hand USB slot. Please remember that the antennas are monopoles, not dipoles. Therefore, they will need a ground plane for optimum performance. Running them without a ground plane will not damage the unit but the transmission performance will be degraded.

## 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 UNC screw thread in the Rosetta case which may be useful for securing the unit.

Before installing in your aircraft visit the PilotAware forum at [forum.pilotaware.com](http://forum.pilotaware.com) to see if there is any location advice from PilotAware users who have installed in your type of aircraft.

## 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 USB connector to pass through the dashboard. 2 metres of cable is supplied with the remote GPS for the connection to Rosetta.

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 bottom left hand USB socket.

## Installing the Radio Antennas;

Both antennas (long 869.5MHz and short 1090MHz) are installed in a similar way. The antennas are 'Monopole Antennas' and therefore **require a ground plane to work properly.**

Metal aircraft will provide this ground plane. Non metal aircraft will require a local ground plane similar to that used for your transponder and or permanent air band radio. The local ground plane should be thin aluminium or copper, as large as possible but as a minimum 20-25cm square.

Each aircraft will be different but we have found that installing on the underbelly is best as this will then provide good communications with the ATOM | GRID network.

Drill a 12mm hole through the outer skin of the fuselage and the ground plane. A step drill is very useful for this. It may be desirable to use thin stainless steel penny washers to spread the load, particularly on plastic or fabric surfaces. It is important that there is electrical connectivity between the antenna case and the aircraft/ground plane. Tighten up the nut and apply Loctite as required. A little petroleum jelly will provide weatherproofing.

Do the same for the second antenna. Positioning of the antenna 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 attenuation.

The antennas should ideally be a minimum of 200 mm away from other antennas and the longer 869.925MHz PilotAware antenna as **far away as possible from the existing 1090MHZ transponder antenna for best operation.**

Connect the BNC end of the coaxial cable to the antenna and route the cable to the location of the Rosetta case. Secure the cable with the cable ties supplied or other preferred methods.

## 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 12v Power supply which has been shown to provide an excellent inexpensive noise free USB supply for PilotAware.

A 12v lighter socket is also provided. This should be cabled to the switched 12V supply (**NOT 24V**) 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 this 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 20AWG.

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 and 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](http://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](http://pilotaware.com).