Remote Telematics Unit
Hardware Versions v3.0/3.5 Installation Guide

# Airmax Remote

April 2020

Ver. 3.0/3.5

# Table of Contents

# 1.0 Contact Information

Initial communications or technical support should be made to:

Customer Support
Airmax Remote Limited
TS4, Pinewood Business Park,
Coleshill Road,
Solihull, West Midlands
B37 7HG

Tel: 0333 358 3489

Email: support@airmaxremote.com

For online queries and FAQ's, please visit:

Support: support.airmaxremote.com

# 2.0 Version Control

| Issue | Date | Disciption |
|-------|------|------------|
| V1.0 | 2005 | Draft release of 1st Gen |
| V2.0 | 2007 | Inclusion of Crank detect cable |
| V2.3 | 2010 | Changes to LED sequence with RTU |
| V3.0 | 01/06/2015 | New RTU design and enclosure |
| V3.5 | 01/03/2020 | Inc additonal saftey information and certifcation |

# 3.0 Preface

Failure to comply with the following warnings, approvals and safety information may invalidate warranty, certification or type approval of this product.

The following information within this installation guide and its instructions are to assist you with installing this product correctly, failure to do so may result in invalidated warranty and recharges to rectify.

1. Any attempt to make modifications not expressly approved by Airmax Remote may invalidate the warranty and the user's authority to use/install the equipment
2. Unauthorised modifications to this or equipment or associated accessories is forbidden without the express permission and agreement from the product manufacturer
3. The equipment should not be operated in hazardous environments i.e. areas that contain explosive materials or flammable vapours
4. Internal components containing beryllium oxide may be used in this equipment. Dust from this material is a health hazard if inhaled or allowed to come into contact with the skin. Great care must be taken when handling any raw material inside this product.
5. The equipment not fitted with a backup battery and is restricted to temperature ranges depending on the build of the hardware:
   - -40C to +85C, storage,
   - -25C to +70C, operating
     The unit will still operate outside of these limits, but reduced performance may appear.

## 3.1 Saftey Information

Please adhere to the following safety and installation information at all times.

RTU Supply Voltage        +6V to +16V Maximum neg ground.
(Overvoltage and transient protection.)

RTU Power Consumption        Operating current <100mA (2.0 Amp peak)
                                   Sleep current < 5mA, "Sleep" < 5mA

Note:
- The Airmax RTU is internally fused
- The currents indicated above are worst case scenario when the device is transmitting at peak power (2.0 Amp peak) and typically a lot lower than illustrated

Important – the device's power supply for the vehicle installation MUST utilise a permanent power feed provided by the vehicle OBD connector, that is NOT subject to a battery isolation 'kill switch' technology. If the vehicle is fitted with a battery isolation 'kill switch' then the permanent power feed must be taken directly from the vehicle battery terminals whereby you may wish to use additional fuses.

## 3.2    Product Certication

**RED Directive**

Airmax Remote Limited hereby declares that the **Remote Telematics Unit** are in compliance with the essential requirements and other relevant provisions of RED directive (formally R&TTE Directive)

The declaration of conformity (DOC) can be supplied on application by contacting Airmax Remote Limited

**CE – marking**

The Airmax RTU product contain a u-blox SARA-G450 radio module whose associated Notified Body. The product contains the following marking:

**FCC – Marking**

The Airmax RTU complies with part b of the FCC Rules and contains the following markings.

Operation of the product is subject to the following conditions:
1. This device may not cause harmful interference
2. This devise must accept any interference received, including interference that may cause undesirable operation.

**VCA Approval**

**E-Marking**

The Airmax RTU and associated products have been approved and cleared for conformity of product schedule 1 of the revision 3 of the E/ECE/TRANS/505. The RTU is also approved by VCA directive for automotive use and contains the following marking:

**Airmax RTU**          Approval No:    E11*10R05/01*10848*00

**Airmax VIM**          Approval No:  e11*72/245*2009/19*5653*00

**Airmax Card Reader**          Approval No:  e11*72/245*2009/19*5654*00

## 3.3    Important Notes

- Whereby the OBD cable is not connected as instructed below it could create missing data resulting a poor performance, for further instructions refer to page 8
- In order for the GPS to function correctly, the RTU antenna must have clear view of the sky in order to complete its start up sequences for further instructions refer to page 11.
- We should inform you that charges may apply to rectify or remedy installations that either do not conform to the below installation instructions or whereby the above inform as not be adhered to.
- Where a cable tie isn't installed - A faulty or loose connection will result in unit malfunction and will be regarded as an incorrect installation, charges may apply to rectify
- Ensure the vehicles electrical cables, hydraulics lines, fuel lines, and safety equipment are not damaged during the installation
- Ensure that normal control and operation of the vehicle is not impaired by the installation, particularly the brakes and steering. Ensure that the airbag operation is not obstructed

## 3.4    Quick Guide

The following installation sequence is recommended. Please refer to the detailed instructions elsewhere in this document for further information.

1. Plan the whole installation and determine suitable locations, mouthing arrangement and cable routes for all hardware
2. Remove the vehicle OBD connector **(Refer to Section 5.2)**
3. Connect the Airmax OBD Connector to the Vehicle connector by plugging in **(Refer to Section 5.3)**
4. Locate a suitable location for the GSM/GPS antenna, facing the sky and not mounted to a metal surface **(Refer to Section 7.0)**
5. Connect the FAKRA Connectors from the antenna to the RTU
6. Turn on vehicle to start power up and borning sequence **(Refer to Section 6.0)**

**NOTE: the RTU will only power on once vehicle is running and detect vehicle comms ONLY once the unit has detected power.**
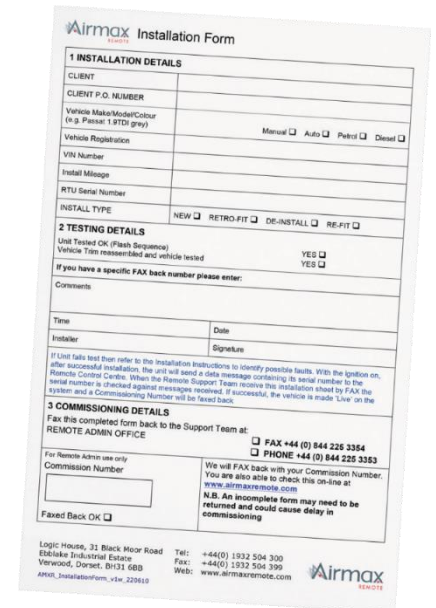
7. Permanently mount the RTU and other hardware in a safe, secure location **(Refer to Section 8.0)**
8. Commission and test system **(Refer to Section 8.1)**

## 4.0 Installation Instructions

1. Check the label on kit bag for recommended vehicle manufacturer types (or specific vehicle order) to confirm suitability for installation.

2. Check the contents of the pack (**Fig1),** it should include (7) items:

   a. Remote Telematics Unit (RTU);

   b. GSM/GPS Antenna;

   c. Vehicle Cable (which matches vehicle OBD);

   d. Airmax Installation Form (AMXIF); and

   e. Installation accessories including:

      i. Cable Ties

      ii. Mounting Pads

      iii. Adhesive Pads

      iv. Cleaning Wipe

NOTE:

- There maybe additional specific order items subject to customer requirements

- The Installation form will need to be completed as part of the installation and be sent to commission@airmaxremote.com.

- For further support please contact: 0333 358 3489

- Make a note of the unit's serial number prior to the installation as this is essential when completing this form

**Fig. 1**

# 5.0 Preparation and Connection

1. Ensure ignition is **switched OFF** prior to starting installation.

2. Locate the onboard diagnostics connector (OBD) on the vehicle which will look similar to the example shown (**Fig 3**).



*Fig. 3*

   *The vehicle trim will need to be removed as required to locate the vehicle's OBD connector demonstrated (**Fig. 4**).*

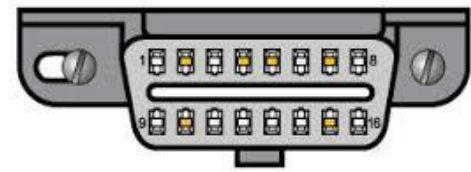3. Check that the cable connector supplied is compatible to the vehicle's connector it will replace.

4. Remove the vehicle's OBD connector from its socket. Then fit the OBD connector supplied in its place.

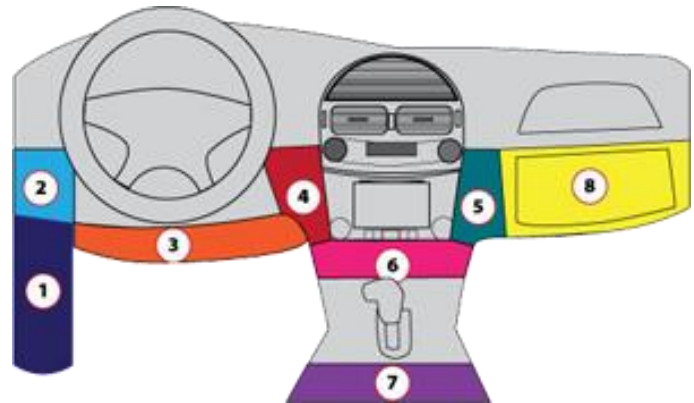5. As per **sections 3.3 adhere to safety information** and Identify a suitable location for the RTU.



*Fig. 4*

6. Plug-in the female OBD connector supplied to the vehicle OBD connector and secure with a small cable tie (**Fig 5**).

7. Identify a suitable location for the antenna. It should be sited on the underside of the dashboard whilst ensuring that it, or the cable, is not fastened to removable panels or trim.

   Antenna misplacement will result in unit malfunction and will be regarded as an incorrect installation Refer to sections 7 for further instructions.

*Fig. 5*



8. Mount the antenna onto a position on the underside of the dash.
   - All mounting areas must be cleaned with the pad/wipe provided and not connected to metal surface.
   - Push the connectors of the antenna into their respective color matching components on the RTU (**Fig 6**).
   - Please ensure wires are clicked in place to ensure a secure connection.
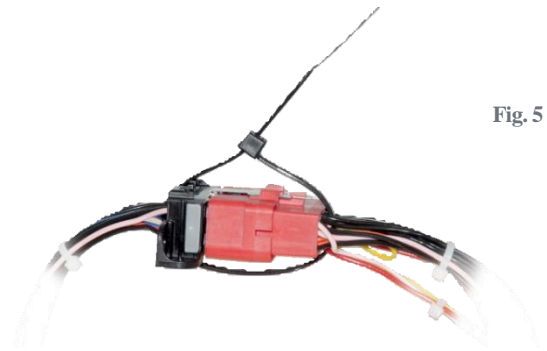
9. Plug the remaining cable connector (Molex) into the RTU (Fig.6).

10. **Now turn the ignition on and start the vehicle.**



*Fig. 6*
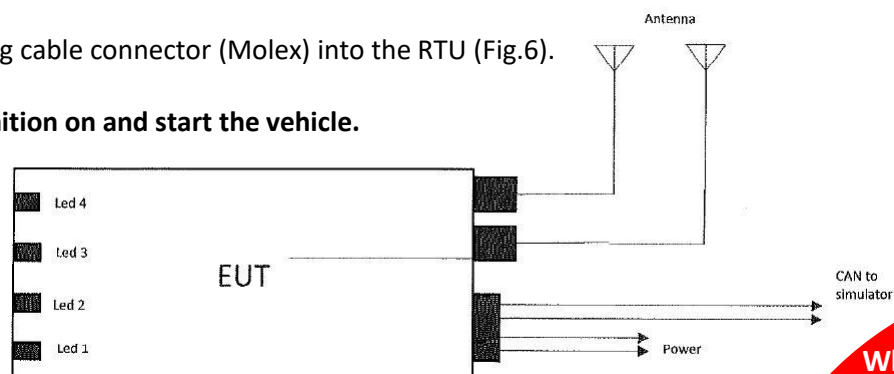
**Where a cable tie isn't installed - Faulty or loose connection will result in malfunction**

The status and correct operation of the unit, both during and after registration, can be determined from the four LEDs on the unit as shown in (**Fig7**).

Refer to Sections 9 for further instructions.

The correct start up sequence is as follows -

1. Each LED will flash in sequence upon (Red, Yellow, Orange, Green and then all illuminate). **Fig 7**

Fig. 7

2. The Yellow (vehicle Comms), Orange (GSM) and Green (GPS) LEDs will flash steadily, (**Fig. 8**) and then remain 'on' when successful in setup

    When these 3 LEDs are all on the unit will transmit data to our systems.

Fig. 8

Red LED - Power    Orange LED - GSM    Yellow LED - Vehicle Comms

3. If successful, the Red LED will illuminate also (and will blink every 4 seconds).

Red LED - Power

4. All four LEDs should now be on solid to demonstrate this stage is complete. (**Fig. 10**, overleaf) Switch off the vehicle's ignition – after a short period all LEDs should be OFF.

    (Red LED will blink on every 5 seconds).

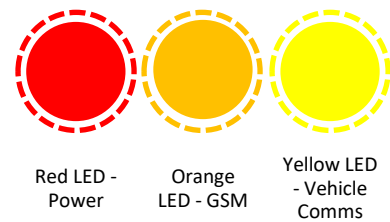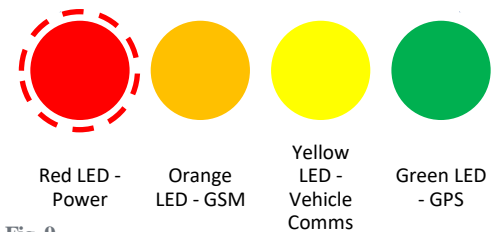Red LED - Power    Orange LED - GSM    Yellow LED - Vehicle Comms    Green LED - GPS

Fig. 9

**In the event that the LED sequences above are not completed, or you are experiencing any issues, please refer to Sections 7 for help and troubleshooting guidance**

**Troubleshooting can be found on section 7**

**Installation of the unit is not complete until it has been registered with the Airmax Remote servers.**

This start up sequence process is automatic and begins as soon as the vehicle's engine is started and the RTU has power, GSM/GPS and vehicle connection, the LED Sequence will indicate its completed steps.

Registration requires the unit to send and receive messages over GPRS using GSM network and should only take approximately 5 minutes. However, in areas of poor network coverage, or in metal skin buildings, registration may be slow, or not possible. Also, the unit will not complete registration until it has obtained a valid GPS fix/position which may be difficult in metal skinned buildings therefore it may be necessary to drive the vehicle to a location with good GPS coverage to complete the process.

## *Installation and Registration continued.*

If registration does not complete within a few minutes, or the unit does not show this sequence of flashing LED then there may be an issue with the installation or hardware placement, please re-check; or use a voltage meter to check power as the vehicle may have its fuse removed, or still in transport mode.

Please refer to the Help / Problems section below.

If you need to contact the Airmax Remote help desk for advice, we may ask you to describe how the LEDs are flashing

NOTE: If the engine is switched off before registration is complete, the unit will attempt to complete the whole sequence again once the engine has been restarted.



Fig. 10

This is because the unit will assume it has not been correctly installed until it has received a message from the Airmax Remote host.

It is important to ensure the unit is working correctly before progressing to 'Completing Installation' i.e. finish securing the unit and re-fitting trim etc.

Do not disconnect any cables once registration is complete as the installation will be considered failed and charges may apply to rectify.

# ▶7.0 Antenna Mounting & Positioning

## 7.1 Choosing the Mounting Location

- The antenna should be installed and located on the underside of the dashboard on a plastic panel, we recommend underneath the dashboard as high as possible pointing towards the "sky", but non- visible to driver (concealed); and
- When selecting a location, ensure that both the antenna and its cables are **NOT**;
  - on any removable panel or trim;
  - on, inside or close to, any metal structure;
  - close to, speakers or speaker cables, airbags or airbag wiring, any ECU within the vehicle, general vehicle cable looms, any sources of electrical "noise" or other GSM / GPS antennas or equipment; or
  - in any location where the cables could be "pinched" by any trim, doors, etc.

| Connector Colour | Description | Notes |
|---|---|---|
| Blue FAKRA | GPS | Connect to Blue RTU Connector |
| Purple FAKRA | GSM | Connect to Purple RTU Connector |

## 7.2 Mounting the Antenna

- Note which side of the antenna has **letters GPS** as the antenna must be positioned with this side facing towards the "sky"
- Apply the adhesive pad to the antenna, ensuring it is on the opposite side to the letters GPS
- Then remove the backing from the other side of the adhesive pad, firmly press the antenna onto the selected surface;
- Secure any loose cable as required.

**Notes:**
- Full adhesion may take 24 hours
- Clean the chosen fixing surface and the antenna with its supplied surface cleaner and allow to dry completely, ensuring that the mounting surface and antenna are free of (a) moisture (especially in cold and wet conditions), (b) oil/grease, or other similar contaminants that might affect adhesion
- Antenna misplacement may result in the unit malfunctioning and will be regarded as an incorrect installation which will ensue a charge to remedy
- All waste accumulated following the completed install is to be disposed of in accordance with waste disposal regulations (WEEE)

## ▶ 8.0 Completing Installation

1. Secure the unit's cable connector (Molex) to the unit using a large cable tie. Please push molex connector until it clicks and is secure.

2. Tie the cable tie around the unit from top to bottom ensuring that the cable tie is inserted between the cables over the connector (**Fig 11**).

3. Secure the unit in a safe and suitable position using the adhesive  pad and large cable tie. It is expected that the second cable tie is used to secure against a solid surface (**Fig 12**).

4. It is not sufficient to only use the sticky pads provided. In addition to using the sticky pads and cable ties provided, ensure  the unit is adequately secured to a rigid structure within the  vehicle and will not rattle, come loose, cause damage to the  vehicle, or in any way affect the driver's use of the vehicle. Furthermore, ensure that it is not affixed to any removable panels, trim, metal structures, speakers or speaker cables, airbags or airbag wiring, general cable looms or  any of the ECU's within the vehicle.

   ▶ Unit misplacement will result in unit malfunction and will be  regarded as an incorrect installation, charges may apply to rectify

5. Tidy any loose cables and fit as necessary.

6. Complete the Commissioning Installation Instructions and provide as instructed in **section 8.1.**

**Fig. 11**

**Fig. 12**

Failure to secure cables and unit with cable ties will result in incorrect installation

## 8.1 Commissioning Installation

Sign and fully complete the remaining sections of the AMXIF by ticking the relevant 'YES/No' boxes and applying your signature.

1. Scan and Email the completed form to the Airmax Remote Support Team using the email provided on the form provide or those listed in contact details.

2. Complete all sections inc. Order Number, Registration, VIN, Mileage and IMEI

3. Upon successful completion of the installation the unit will automatically send a registration message to the Airmax Remote server.

4. When the Support Team receive this registration message, and confirm that this relates to a valid order, they will commission the unit using the details provided from the AMXIF and provide a CID Number as authentication.



**Fig. 13**

# 9.0 Engineering Mode
## 7.1 LED Sequence Explanations

The following table explains the LED flash sequences.

The unit will have been fully tested prior to delivery and there are no adjustable or serviceable parts. Should the unit not operate correctly please check all connections. If the unit is still not operational there may be a fault with the equipment.

If a fault is encountered during installation, please contact the Airmax Remote Product & Support Team

| LED | |
|---|---|
| Yellow, Amber and Green LEDs ON constantly and Red LED ON with a short blink OFF every 4 seconds | Unit powering-up and operating correctly |
| Yellow LED flashing steadily | Unit is trying to communicate with the Vehicle |
| Amber LED flashing steadily | Unit is trying to communicate with GSM Network |
| Green LED flashing steadily | Unit is trying to get a valid GPS Fix |
| Red LED OFF and flashing ON every 4 seconds | Unit not yet registered Yellow, Amber and Green LED show unit status |
| Yellow, Amber and Green LEDs OFF and Red LED blinking ON every 5 Second | Unit is in sleep mode and will start up again as soon as the vehicle is started (or on other timed events) |
| Red LED permanently OFF | Unit hardware Failure or cable/power problem |
| Red LED permanently ON - no occasional flash OFF (during normal power up the red LED will be constantly ON until unit starts talking to the vehicle) | Unit hardware failure |
| Red LED rapidly flashing | Unit System or configuration Failure |
| Yellow LED rapidly flashing | Unable to identify the vehicle bus or connect to the vehicle |
| Amber LED rapidly flashing | Unit GSM Hardware, Mobile network communication error or Antenna failure |
| Green LED rapidly flashing | Unit GPS hardware or Antenna failure |

## 7.2 Troubleshooting

| PROBLEM | POSSIBLE CAUSE | ACTION |
|---------|----------------|--------|
| NO LEDs come ON | EOBD cable fault or not properly connected | Check Connections and that connectors are fully mated at both ends of the cable |
| | No power to EOBD connector | Check power and fuses |
| | Unit has been damaged during transit or installation | Contact AMX support to arrange return of complete kit and try alternative kit |
| Yellow LED remains steadily Flashing | Unit does not support the vehicle diagnostics bus type used on the vehicle | Contact AMX support to check suitability of kit who may advise you arrange return of complete kit and or, where possible, ask you try an alternative kit |
| | EOBD cable fault or not properly connected | |
| Amber LED remains steadily Flashing | Poor antenna sitting | Check location and ensure antenna is not fixed to metal surface |
| | No GSM coverage | Move car to location with known better GSM coverage |
| | Antenna fault | Check Connections |
| | GSM network problem | Wait and try later |
| | AMX host network problem | Contact AMX support |
| Green LED remains steadily Flashing (may take up to 10 Mins to get first GPS Fix) | Bad GPS coverage | Move vehicle to more "open" location |
| | Poor antenna sitting | Check location and ensure antenna is located with the correct side pointing towards an open space and is not fixed to metal surface |
| With engine running Yellow, Amber and Green LEDs OFF and Red LED blinking ON every 5 seconds | Battery Voltage low. (less than 13.6volts) | Run engine until battery voltage rises |
| | Unit has been damaged during transit or installation | Contact AMX support to arrange return of complete kit and try |

# 10.0 Glossary of Terms and Abbreviations

| | |
|---|---|
| **Card Reader** | In Vehicle Driver ID Reader |
| **Born** | When the device send initial SMS to Airmax Servers for authentication |
| **CAN** | Controller Area Network |
| **CID** | Commissioning Identification Number |
| **Commission** | Activation of Airmax RTU |
| **Connectivity** | Telecommunications Network – GPS and GSM |
| **ECU** | Electronic Control Unit |
| **Firmware** | Software loaded to operate the RTU |
| **IMEI** | International Mobile Equipment Identity |
| **GSM** | Global Systems for Mobiles |
| **GPS** | Global Positioning Satellites |
| **GPRS** | General Packet Radio Service |
| **OBD** | Onboard diagnostic Port |
| **ISO** | International Organisation for Standards |
| **LED** | Light Emitting Diode |
| **RTU** | Airmax 'Remote Telematics Unit' |
| **R&TTE** | Radio Equipment and Telecommunications Terminal Equipment |
| **SMS** | Short Message Service - Text |
| **Telematics** | telecommunications & vehicular technology, recording vehicle and location data. |
| **VIN** | Chassis Number, or Vehicle Identification Number |
| **VIM** | Vehicle Interface Model to Emergency Service Ancillary Items i.e. Blue Lights |
| **WEEE** | Waste Electrical and Electronic Equipment Regulation |
| **VCA** | Vehicle Certification Agency |