Aerobits

Subsystems for the
UAS intergration into
the airspace

Ground Station based on Sector Antenna

Data sheet & User manual
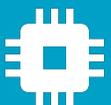
Introduction

FGS is station based on sector antenna technology . **ADS-B** and **FLARM** transceivers used in the drone technique have relatively small RF transmitting power. Efficient tracking of such objects requires the design of highly sensitive receivers. The antenna technology is helpful in this case, which allows for significant **improvement of input sensitivity**.

Sector antennas allow to increase the operation range of ADS-B/FLARM signals in selected directions several times. This product is easy networkable using **Ethernet/PoE** or **LTE** connectivity and is optimized to work in harsh environment. Apart from drone technology, the antenna can be used in manned traffic surveillance ADS-B.

NOTE: The device to operate on FLARM frequency requires FLARM UAS license. The license can be obtained with the device from Aerobits upon purchase. FLARM library expire after year and must be updated with latest firmware.

Applications

- Airports and critical infrastructure
- Nationwide traffic management systems (manned and unmanned)
- Perfect solution for local airfields
- U-Space and UTM systems
- Ground Network air traffic surveillance systems

For more information please contact: support@aerobits.pl.

Date: 2023-05-15   Document ref: 23f-v1.1.0

This document is subject to change without notice. For technical questions, contact: support@aerobits.pl

Contents

1 Technical parameters

1.1 Basic technical information

Parameter	Description	Typ.	Unit
First Band	ADS-B	1090	MHz
Second Band	FLARM	868	MHz
Sensitivity (ADS-B)		-90	dBm
Sensitivity (FLARM)		-130	dBm
Vpol beamwidth (6dB)		120	deg
Elevation beamwidth (6dB)		15	deg
Integrated GNSS	Multi-GNSS for precise time stamp		
LTE Cat. 1	Data transport layer (global bands)		

Table 1: General technical parameters.

1.2 Electrical specification

1.2.1 Power supply

Parameter	Value
Power connector	Standard USB connector (programming and power supply)
Power consumption	1.5 W
Power supply	100 - 240 VAC

Table 2: Power supply of FGS

1.2.2 LED indicators

LED	Color	Function
PWR1 (Power)	White	Constant light - Power supply by programming cable Off – No power or mains powered.
PWR2 (Power)	White	Constant light - Power supply presence Off – No power, connect or recharge power source

Table 3: Electrical parameters

Figure 1: FGS front

1.3 Mechanical specification

1.3.1 Mechanical parameters

Parameter	Value
Dimensions	1290 x 290 x 134 mm
Weight	13 kg

Table 4: Mechanical parameters of FGS

1.3.2 Mounting information

Parameter	Value
Mounting pole	30 - 75mm

Table 5: Mechanical parameters of installation components.

NOTE: For more information visit www.ui.com/airmax/airmax-sector-antenna/. All mechanical parameters are included in **airMAX Sector Antennas Datasheet**.

Date: 2023-05-15 Document ref: 23f-v1.1.0

This document is subject to change without notice. For technical questions, contact: support@aerobits.pl

2 Quick start

2.1 Scope of delivery

1. Receiver based on HOD module

2. Main Power Cable 10m

3. USB Programming Cable 1.5m

4. 4G+GPS Antenna with GNSS and LTE cable

5. Power Supply

6. Mechanical installation components for sector antenna

7. 2x2 MIMO BaseStation Sector Antenna (airMAX® AM-9M13)

Figure 2: FGS equipment kit

2.2 Receiver

Figure 3: Receiving module without cover

Date: 2023-05-15   Document ref: 23f-v1.1.0

This document is subject to change without notice. For technical questions, contact: support@aerobits.pl

2.2.1 Basic capture

Receiver based on HOD module is described below. To properly use sector antenna, module must be placed in the correct place inside BaseStation case and all antenna must be plugged in.

Figure 4: Receiving module caption

2.2.2 Plugging GNSS and LTE antennas

Figure 5: GPS and LTE Antenna cable plug

2.2.3 Plugging ADS-B and FLARM antennas
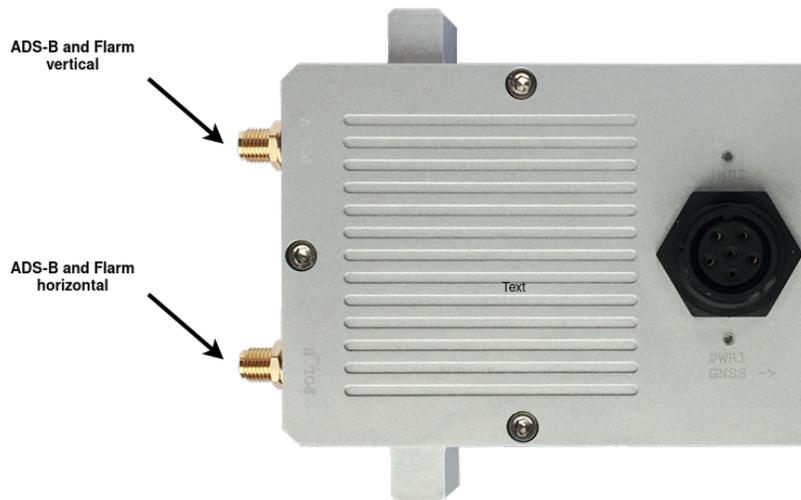
Figure 6: ADS-B and FLARM Antenna cable plug

2.2.4 Power supply connection

Figure 7: Power supply connection

NOTE: Brown wire in Main Power cable is + and white is -, remember to connect external ground supply to the Main Power cable!!

2.3 BaseStation Sector Antenna

2.3.1 Mounting kit

- Antenna with cover
- 2 x U-Brackets
- 3 x V-Brackets

Date: 2023-05-15   Document ref: 23f-v1.1.0

This document is subject to change without notice. For technical questions, contact: support@aerobits.pl

- 2 x M12x180 Bolts

- 2 x M12x130 Bolts

- 4 x M8x25 Bolts

- 1 x M3x8 Tapping Screw

- 8 x M12 Serrated Flange Nuts

- 4 x M8 Serrated Flange Nuts

- Bushing

2.3.2 Where to mount

Sector Antenna can be mounted on vertical pole with a diameter of 30-75mm.

Figure 8: Pole mounting. Source: AM-9M13 Quick Start Guide (www.ui.com/airmax/airmax-sector-antenna/)

2.3.3 Mounting instructions

Sector Antenna is external standalone product. **For more information visit www.ui.com/airmax/airmax-sector-antenna/.** All mounting instructions are included in **AM-9M13 Quick Start Guide**.

2.4 Inserting a SIM/chip card

Ground stations based on **the HOD V2** need a valid SIM card. Recommended way to change/insert SIM card is described below.

1. Disconnect module.

Ensure that you have HOD disconnected and take off module cover. To unmount cover you will need a cross screwdriver.

2. Find SIM card slot and insert SIM card.

It is not recommended to unmount the HOD V2 because of very sensitive connections. The slot is visible after turning the housing.
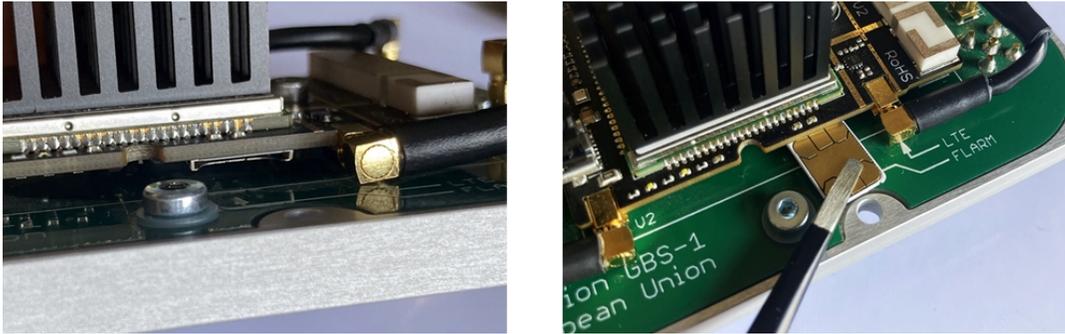
Insert SIM card into slot visible on the picture above. A simple way to do it is to grab SIM with tweezers and push it carefully directly into slot. Then attach the device back (if unmounted) and mount the cover.

Please read carefully

Information contained in this document is provided solely in connection with Aerobits products. Aerobits reserves the right to make changes, corrections, modifications or improvements to this document, and to products and services described herein at any time, without notice. All Aerobits products are sold pursuant to our own terms and conditions of sale. Buyers are solely responsible for the choice, selection and use of the Aerobits products and services described herein, and Aerobits assumes no liability whatsoever, related to the choice, selection or use of Aerobits products and services described herein. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services, it shall not be deemed a license granted by Aerobits for use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering use, in any manner whatsoever, of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN AEROBITS TERMS AND CONDITIONS OF SALE, AEROBITS DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO USE AND/OR SALE OF AEROBITS PRODUCTS INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHAN-TABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED AEROBITS REPRESENTATIVE, AEROBITS PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE.

Information in this document supersedes and replaces all previously supplied information.

Date: 2023-05-15   Document ref: 23f-v1.1.0

This document is subject to change without notice. For technical questions, contact: support@aerobits.pl