



See beyond

Subsystems for UAS
integration into the airspace

Who we are?



Aerobits is a Polish technology company that has been operating on a global market since 2017. We deal with miniaturization of avionic systems, such as aviation transponders.

All solutions are based on a patented technology that allows to process radio signals on very small surfaces. This concept is at the core of our OEM modules (low-level assembly function modules), which are the basic building block of miniaturized avionics.



Developing safety in the airspace

Unmanned Aircraft Systems (UAS), commonly known as drones, open up new opportunities in the civil, commercial and military sectors. However, this impressive technology comes with certain risks.

UAS enter the orderly airspace that until now was used only by manned air traffic. Legal regulation of the use of the airspace turns out to be insufficient for many reasons and forces the search for system concepts. A hint here are aviation solutions and procedures that have evolved over the years along with the growing volume of traffic.

ATM (Air Traffic Management), having various types of radars, is able to locate manned aircraft and guarantee safe separation between them. Also in unmanned systems it is planned to implement a similar solution called UTM (Unmanned Traffic Management). UTM will be nothing else but a functional extension of ATM. It is about the integration of drones into the airspace, which is seen as one of the greatest challenges of

modern aviation. The main difficulty is to ensure anti-collision for all airspace users, in line with the DAA (Detect and Avoid) concept. Achieving this goal is possible by maintaining system compatibility between manned and unmanned aviation. Therefore, it is necessary to miniaturize the avionics, which will allow the installation of appropriate systems on small drones.

The intensification of global activities towards the inclusion of UAS into the airspace shows the idea of fusing many information technologies. In addition to micro-avionic systems, UAS will also be equipped with technologies such as Wi-Fi, Bluetooth and LTE. It will allow easier identification and tracking by local airspace managers.



Subsystems for UAS integration into the airspace



Global reach

Our technologies are currently used in over 40 countries by over 150 customers.



Monitoring of airspace

We create solutions for the broadly understood management and monitoring of airspace.



Ground infrastructure

Our ground infrastructure is becoming frequent requirement in the European Union and beyond.



Leader in the world

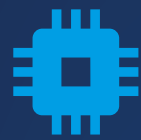
Due to very early ideas of miniaturization of avionics, we became a leader in the world.

Our history

The beginnings of Aerobits date back to 2015, when a subminiature ADS-B implementation (Automatic Dependant Surveillance-Broadcast) was created at the West Pomeranian University of Technology in Szczecin in conjunction with the multi- GNSS (Global Navigation Satellite Systems) function. The OEM module with an area of only <4cm² and weighing 1.5g, to this day is the smallest ADS-B / GNSS fusion in the world.

A year later, much faster systems with FPGA support were created and presented for the first time publicly at the ILA Berlin Air Show 2016. Our solutions were interesting for various institutions and organizations which are responsible for creating the laws for the UAS in the European Union. An additional impulse for further actions was the prestigious award in the European Satellite Navigation Competition 2016. It was just the beginning - during 2019 we received a grant from NCBiR (project value 2,5 mln PLN), in 2020 we had our first deployments of the UAS monitoring ground infrastructure in Poland and Germany and during 2021 we have conducted with LMT, Latvia's Telekom, nationwide demonstrational PoC for UAS monitoring system. Together with our partner Droniq GmbH, a JV by DFS & Deutsche Telekom, we build on a common standard for the UTM/U-Space in Europe.





OEM

- low level modules

Aerobits provides low-level ADS-B devices for integration directly on printed circuit boards. It is a convenient way to design unique devices that require access to air traffic information in their structure. We offer multiple technological solutions that differ in size and data processing capabilities.

Depending on the target application, we offer single and multi-core solutions based on ADS-B and FLARM technology and some with integrated GNSS receivers. The smallest solutions are the size of the one cent coin. An important feature of the modules is the very high ADS-B input sensitivity of the receivers, ensuring compliance with avionic standards on an extremely small surface.

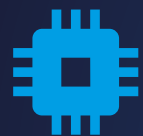
Regardless of the type of module, we offer the customization of the firmware, which provides a number of communication interfaces and on-demand software solutions.



Sub-miniature ADS-B/FLARM modules for direct integration on PCB



Product	TT-MC1	TT-SC1	TT-SC1-EXT	TT-SF1	TT-SG1
CARRIER FREQUENCY (MHZ)	1090 (ADS-B)	1090 (ADS-B)	1090 (ADS-B)	1090 (ADS-B) 868, 915 (FLARM) 3 GNSS concurrent	1090 (ADS-B) 3 GNSS concurrent
RX SENSITIVITY (DBM)	-87 ADS-B	-84 (ADS-B)	-84 (ADS-B)	-80 (ADS-B) -93 (FLARM) -167(GNSS)	-88 (ADS-B) -167 (GNSS)
POWER SUPPLY (DCV)	3.3 (digital) 5 (RF)	3.3	3.3	3.3	3.3
CURRENT CONSUMPTION (MA)	260	70	70	130	130
DIMENSIONS (MM)	19x18 (a) 19x22.5 (b)	13x16(a) 13x20(b)	13x16(a) 13x20(b)	19x18.5(a) 19x22.5(b)	19x18.5(a) 19x22.5(b)
WEIGHT (G)	1.8	1.2	1.2	1.8	1.8
ADS-B IN	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FLARM (IN/OUT)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MODE A/C/S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BUILD-IN GNSS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TIMESTAMP (MLAT DATA SOURCE)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GNSS				72-channel engine GPS/QZSS L1 C/A GLONASS L10F BeiDou B1I Galileo E1B/C1SBAS L1 C/A WAAS, EGNOS, MSAS, GAGAN	72-channel engine GPS/QZSS L1 C/A GLONASS L10F BeiDou B1I Galileo E1B/C1SBAS L1 C/A WAAS, EGNOS, MSAS, GAGAN



OEM

- low level modules



TT-MC1

TT-MC1 is a high-performance OEM receiver series operating at 1090MHz. The patented FPGA-In-The-Loop™ technology and 3-Core CPU allows high-speed RF data processing with significantly reduced number of electronic components.

TT-MC1 offers the possibility of receiving and decoding ADS-B and Mode-A/C/S. The analysis of the power/quality of the RF signal and the use of time stamps facilitates the implementation of multilaterations.

ADS-B MODE A/C/S

Features:

- Fastest ADS-B implementation on a surface of <4cm²
- Receiving of ADS-B, Mode-A/C/S with RF signal
- Multiple supported protocols: AERO, MAVLink
- Strength/quality analysis
- Evaluation kit available
- Scalable OEM solution with enormous customization potential
- Firmware update capability
- Weight < 2g
- Designed to meet MOPS defined in TSO-C199

Application:

- SAA / DAA (Sense and Avoid / Detect and Avoid)
- UAS ground stations and high-density traffic surveillance
- UTM / U-Space construction (traffic surveillance network)
- Traffic-flow analysis and statistics
- Monitoring of 1090MHz band (signal integrity check)
- ADS-B/In/Out devices that meet the NextGen/SESAR philosophy



TT-SC1

TT-SC1 is a high quality and low SWaP OEM ADS-B receiver series operating at 1090MHz. The patented FPGA-In-The-Loop™ technology allows high-speed RF data processing with significantly reduced number of electronic components.

Simultaneous miniaturization of the module and its OEM nature open a wide range of possible applications.

ADS-B

Features:

- Smallest ADS-B implementation on a surface of <2cm²
- Receiving of ADS-B with RF signal strength/quality analysis
- Simple module integration and configuration via UART interface and AT commands
- Multiple supported protocols: AERO, MAVLink
- Scalable OEM solution with enormous customization potential
- Firmware update capability
- Small outline: 16.0(a)/20.0(b) x 13.0 x 2.65mm
- Designed to meet MOPS defined in TSO-C199
- Evaluation kit available

Application:

- SAA / DAA (Sense and Avoid / Detect and Avoid)
- UAS collision avoidance systems
- UTM / U-Space traffic awareness devices
- Early warn devices for UAS operators
- Collision prediction devices for gliders / paragliders
- ADS-B In devices that meet the NextGen/SESAR philosophy

TT-SC1-EXT

TT-SC1-EXT is a high quality and low SWaP OEM ADS-B receiver series operating at 1090MHz.

Mode A/C/S in the concept with precise timestamp for enabling multilateration implementations..

The patented FPGA-In-The-Loop™ technology allows high-speed RF data processing with significantly reduced number of electronic components.

Simultaneous miniaturization of the module and its OEM nature open a wide range of possible applications.

ADS-B MODE A/C/S



Features:

- Smallest ADS-B implementation on a surface of <2cm²
- Receiving of Mode A/C/S with RF signal strength/quality analysis
- Time stamp (raw data only) for multilateration
- High-resolution ADC with real-time signal processing; best-in-class aircraft tracking
- High sensitive front-end, jamming and ESD protection (only TT-SC1b) with ranges over 150 km (open space, 1dBi antenna)
- Simple module integration and configuration via UART interface and AT commands
- Multiple supported protocols, i.a. MAVLink, GDL90
- Scalable OEM solution with enormous customization potential (additional functions or interfaces on request)
- Firmware update capability (uC and FPGA)
- Low power consumption 3.3V/70mA
- Small outline: 16.0 x 13.0 x 2.65mm, ver. (a); 20 x 13.0 x 2.65mm, ver. (b), weight < 1.5g
- Designed to meet MOPS defined in TSO-C199
- Evaluation kit available.

Application:

- SAA / DAA (Sense and Avoid / Detect and Avoid)
- UAS collision avoidance systems
- UTM / U-Space traffic awareness devices
- Early warn devices for UAS operators
- Collision prediction devices for gliders / paragliders
- ADS-B In devices that meet the NextGen/SESAR philosophy



TT-SF1

TT-SF1 is a high quality OEM ADS-B/GNSS receiver/FLARM transceiver series operating at 1090MHz and region-dependent FLARM frequency. It is based on the proven FPGA-In-The-Loop technology, which is a unique combination of a single-core processor and FPGA.

ADS-B MODE A/C/S FLARM GNSS

Features:

- Fastest ADS-B implementation on a surface of <4cm²
- Receiving of ADS-B, Mode-A/C/S with RF signal
- licensed FLARM technology
- RF signal strength/quality analysis
- Time stamp for multilateration
- Best-in-class aircraft tracking
- Multiple supported protocols: AERO, MAVLink
- Scalable OEM solution with enormous customization potential
- Firmware update capability
- Weight < 2g
- Designed to meet MOPS defined in TSO-C199
- Evaluation kit available

Application:

- SAA / DAA (Sense and Avoid / Detect and Avoid)
- UAS ground stations and high-density traffic surveillance
- UTM / U-Space construction (traffic surveillance network)
- Traffic-flow analysis and statistics
- Monitoring of 1090MHz band (signal integrity check)
- ADS-B/In/Out devices that meet the NextGen/SESAR philosophy



TT-SG1

TT-SG1 is a high quality OEM ADS-B/GNSS receiver series operating at a frequency 1090MHz. It is based on the proven FPGAInTheLoop technology, which is a unique combination of a single-core processor and FPGA.

ADS-B MODE A/C/S GNSS

Features:

- Fastest ADS-B implementation on a surface of <4cm²
- Receiving of ADS-B, Mode-A/C/S with RF signal
- Build in GNSS receiver
- RF signal strength/quality analysis
- Time stamp for multilateration
- Best-in-class aircraft tracking
- Multiple supported protocols: AERO, MAVLink
- Scalable OEM solution with enormous customization potential
- Firmware update capability
- Weight < 2g
- Designed to meet MOPS defined in TSO-C199
- Evaluation kit available

Application:

- SAA / DAA (Sense and Avoid / Detect and Avoid)
- UAS ground stations and high-density traffic surveillance
- UTM / U-Space construction (traffic surveillance network)
- Traffic-flow analysis and statistics
- Monitoring of 1090MHz band (signal integrity check)
- ADS-B/In/Out devices that meet the NextGen/SESAR philosophy



EVALS

- for quick integration

If you want to quickly try the possibilities offered by our modules, the evaluation set is certainly a product for you. Dedicated printed circuit board contains all necessary components to run the module.

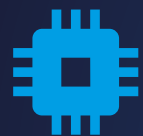
All additional input/output pins and external power supply options are available. In addition, together with the evaluation kit you can use our software Micro ADS-B which is described further.



Sub-miniature ADS-B/FLARM modules
for direct integration on PCB



Product	EVAL-TT-SC1	EVAL-TT-SC1-EXT	EVAL-TT-MC1	EVAL-TT-SF1	EVAL TT-SG1
WEIGHT (G)	25	25	25	25	25
DIMENSIONS (MM)	60,5 × 41	60.5 × 41	66 x 41	70 × 43	70 × 43
CARRIER FREQUENCY (MHZ)	1090 (ADS-B)	1090 (ADS-B)	1090 (ADS-B)	1090 (ADS-B) 868, 915 (FLARM) 3 GNSS concurrent	1090 (ADS-B) 3 GNSS concurrent
RX SENSITIVITY (DBM)	-84 ADS-B	-84 ADS-B	-87 ADS-B	-80 ADS-B -93 FLARM -167 GNSS	-88 ADS-B -167 GNSS
POWER SUPPLY (DCV)	5V or 3.3V or USB	5V or 3.3V or USB	5V or USB	5V or 3.3V or USB	5V or 3.3V or USB
CURRENT CONSUMPTION (MA)	80	80	270	140	140
ADS-B IN	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FLARM (IN/OUT)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MODE A/C/S	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BUILD-IN GNSS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
USB CONECTOR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TIMESTAMP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



EVALs

- for quick integration



EVAL TT-SC1

The evaluation kit provides a quick introduction to the TT-SC1 module. It is a high quality 1090MHz band receiver with an integrated ADS-B (Automatic Dependent Surveillance – Broadcast) decoder, conforming to MOPS specified in TSO-C199.

EVAL-TT-SC1 with the dedicated software allows the user to discover the module properties within a short time, paving the way towards quick prototyping, through tabular and 3D views.

Features:

- Quick start with the OEM TT-SC1 module
- Designed to be powered by USB or an external 5V or 3.3V supply
- Two LED for USB communication and one LED for internal functions
- Virtual COM port with simple firmware update capability
- Extension header for external power supply and communication)
- ESD protection
- All necessary components in the box (antenna, USB cable, etc.)
- Dedicated software available

Application:

- Evaluation board
- Wideband antenna (0-1dBi) 3m
- U.fl / SMA adapter 10.5cm
- USB cable 30cm
- 2 x Pinheader for extensions connector



EVAL TT-SC1-EXT

The evaluation kit provides a quick introduction to the TT-SC1-EXT module series. It is a high-quality 1090MHz band receiver with an integrated ADS-B (Automatic Dependent Surveillance-Broadcast) decoder, conforming to MOPSS specified in TSO-C199. It brings everything you need to run your SC1-EXT module and quickly get started with the development of your MODE A/C/S and ADS-B system. For more advanced users this module also provides a precise timestamp for enabling multi-lateration implementations.

Features:

- Quick start with the OEM TT-SC1-EXT module
- Designed to be powered by USB or an external 5V or 3.3V supply
- Two LED for USB communication and one LED for internal functions
- Virtual COM port with simple firmware update capability
- Extension header for external power supply and communication)
- ESD protection
- All necessary components in the box (antenna, USB cable, etc.)
- Dedicated software available

Application:

- Evaluation board
- Wideband antenna (0-1dBi) 3m
- U.fl / SMA adapter 10.5cm
- USB cable 30cm
- 2 x Pinheader for extensions connector

EVAL TT-MC1



The evaluation kit provides a quick introduction to the TT-MC1 module. It is a high quality 1090MHz band receiver with an integrated ADS-B (Automatic Dependent Surveillance – Broadcast) decoder, conforming to MOPS specified in TSO-C199.

EVAL-TT-MC1 with the dedicated software allows the user to discover the module properties within a short time, paving the way towards quick prototyping, through tabular and 3D views.

Features:

- Quick start with the OEM TT-MC1 module
- Designed to be powered by USB or an external 5V supply
- LED for USB communication and one LED for internal functions
- Virtual COM port with simple firmware update capability
- Extension header for external power supply and communication
- ESD protection
- All necessary components in the box (antenna, USB cable, etc.)
- Dedicated software available

Application:

- Evaluation board
- Wideband antenna (0-1dBi) 3m
- U.fl / SMA adapter 10.5cm
- USB cable 30cm
- 2 x Pinheader for extensions connector



EVAL TT-SF1

The evaluation kit provides a quick introduction to the TT-SF1 module. It is a high-quality 1090MHz band receiver with an integrated ADS-B (Automatic Dependent Surveillance – Broadcast) decoder, conforming to MOPSS specified in TSO-C199. EVAL TT-SF-1 is capable of receiving FLARM from surrounding air traffic.

Features:

- Quick start with the OEM TT-SF1 module
- Designed to be powered by USB or an external 5V supply
- Two LED for USB communication and one LED for internal functions
- Virtual COM port with simple firmware update capability
- Extension header for external power supply and communication
- ESD protection
- All necessary components in the box (antenna, USB cable, etc.)
- Dedicated software available

Application:

- Evaluation board
- Wideband antenna (0-1dBi) 3m
- U.fl / SMA adapter 10.5cm
- USB cable 30cm
- 2 x Pinheader for extensions connector



EVAL TT-SG1

The evaluation kit provides a quick introduction to the TT SG1 module. It is a high-quality 1090MHz band receiver with an integrated ADS-B (Automatic Dependent Surveillance Broadcast) decoder, conforming to MOPSS specified in TSO C199. EVAL TT-SG1 with the dedicated software allows the user to discover the module properties within a short time, paving the way towards quick prototyping. GNSS source integrated.

The software allows simple configuration of the module and data visualization in various modes, from raw data, through tabular and 3D views.

Features:

- Quick start with the OEM TT-SG1 module
- Designed to be powered by USB or an external 5V supply
- Two LED for USB communication and one LED for internal functions
- Virtual COM port with simple firmware update capability
- Extension header for external power supply and communication
- ESD protection
- All necessary components in the box (antenna, USB cable, etc.)
- Dedicated software available

Application:

- Evaluation board
- Wideband antenna (0-1dBi) 3m
- U.fl / SMA adapter 10.5cm
- USB cable 30cm
- 2 x Pinheader for extensions connector



Plug&Play

ADS-B (IN, OUT)

In this product group, we offer ADS-B receivers and ADS-B / FLARM transceivers. In sets, you will find all the necessary wiring and/or parameterization tools such as communication converters. Solutions start with the most compact and providing basic functionality, through middle-end solutions up to the top multisystem solutions.

The drone user at every level will find something for themselves in this products category. Short and clear instructions will help you how to quickly integrate into your existing drone system.



UAS-ready equipment to meet the DAA (Detect and Avoid) philosophy



Product	Aero	Aero Pro	TR-1W	TR-1A	TR-1F
DIMENSIONS [MM]	27 × 14 × 5.5	31.5 × 15.5 × 7.3	45.5 × 28 × 10	35 × 25 × 8.5	35 × 25 × 8.5
ADS-B IN	☒	☒	☒	☒	☒
ADS-B (IN/OUT)	☐	☐	☒	☒	☒
FLARM (IN/OUT)	☐	☐	☐	☐	☒
BUILD-IN GNSS	☐	☐	☒	☒	☒
BUILD-IN PRESSURE SENSOR	☐	☐	☒	☒	☒
CARRIER FREQUENCY [MHZ]	1090 (ADS-B)	1090 (ADS-B)	1090 (ADS-B) 3 GNSS concurrent	1090 (ADS-B) 3 GNSS concurrent	1090 (ADS-B) 868, 915 (FLARM) 3 GNSS concurrent
RX SENSITIVITY [DBM]	-84 ADS-B	-84 ADS-B	-84 ADS-B	-88 ADS-B -167 GNSS	-80 ADS-B -93 FLARM -167 GNSS
WEIGHT [G]	2.8	5	30	20	20
MAVLINK	☒	☒	☒	☒	☒
MA EXTENDED PROTOCOLS: CSV, GDL90, ASTERIX VLINK	☐	☐	☒	☒	☒
MODE-A/C/S	☐	☐	☒	☒	☒
TIMESTAMP (MLAT DATA SOURCE)	☐	☐	☒	☒	☒



Trackers

UTM/U-space devices

This group presents UTM/U-Space dedicated solutions based on technology like LTE, BLE. U-space is a set of new services relying on a high level of digitalization and automation of functions and specific procedures designed to support safe, efficient and secure access to airspace for large numbers of drones (UAS).

As the number of flights increases, U-Space services will provide coordination and oversight to make safe operations in reality. Airspace will be dynamically managed to improve through shared operational data. Our products are designed to support this extremely important process.



UAS-ready equipment to meet the DAA (Detect and Avoid) philosophy

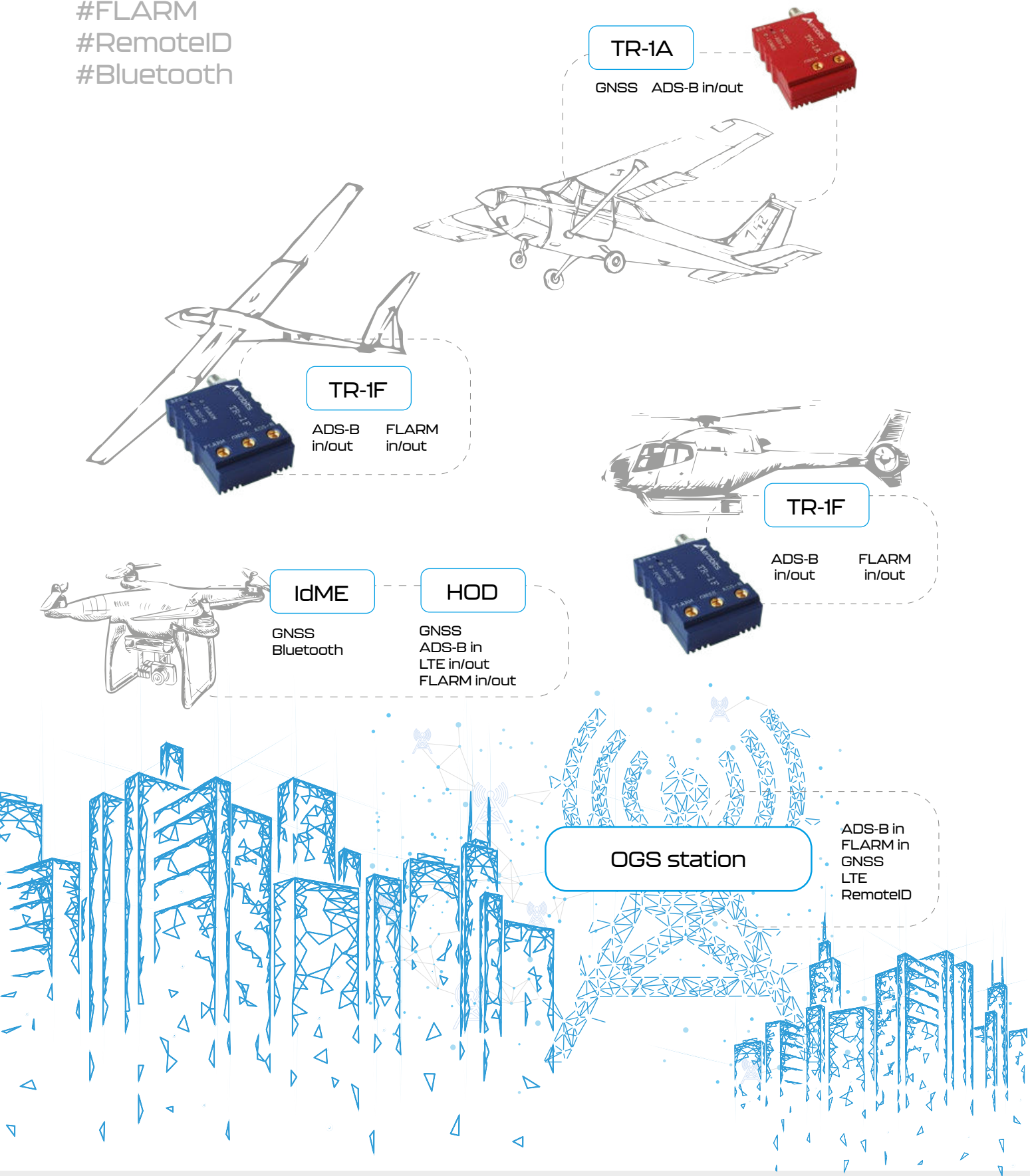


Product	idME	idME+	HOD
WEIGHT [G]	4	5	40
DIMENSIONS [MM]	31.5 × 15.5 × 7.3	31.5 × 15.5 × 7.3	58 × 38 × 9.5
ADS-B IN	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ADS-B (IN/OUT)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
REMOTE IDENTIFICATION	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FLRAM (IN/OUT)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
BUILD-IN GNSS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BUILD-IN PRESSURE SENSOR	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
LTE	<input type="checkbox"/>	<input type="checkbox"/>	Europe/Asia or Global
CARRIER FREQUENCY [MHZ]	2400	2400	1090 (ADS-B) 868, 915 (FLARM) 3 GNSS concurrent
RX SENSITIVITY [DBM]	-105 BT	-105 BT	-84 ADS-B -104 FLARM
MAVLINK	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

UTM/U-Space

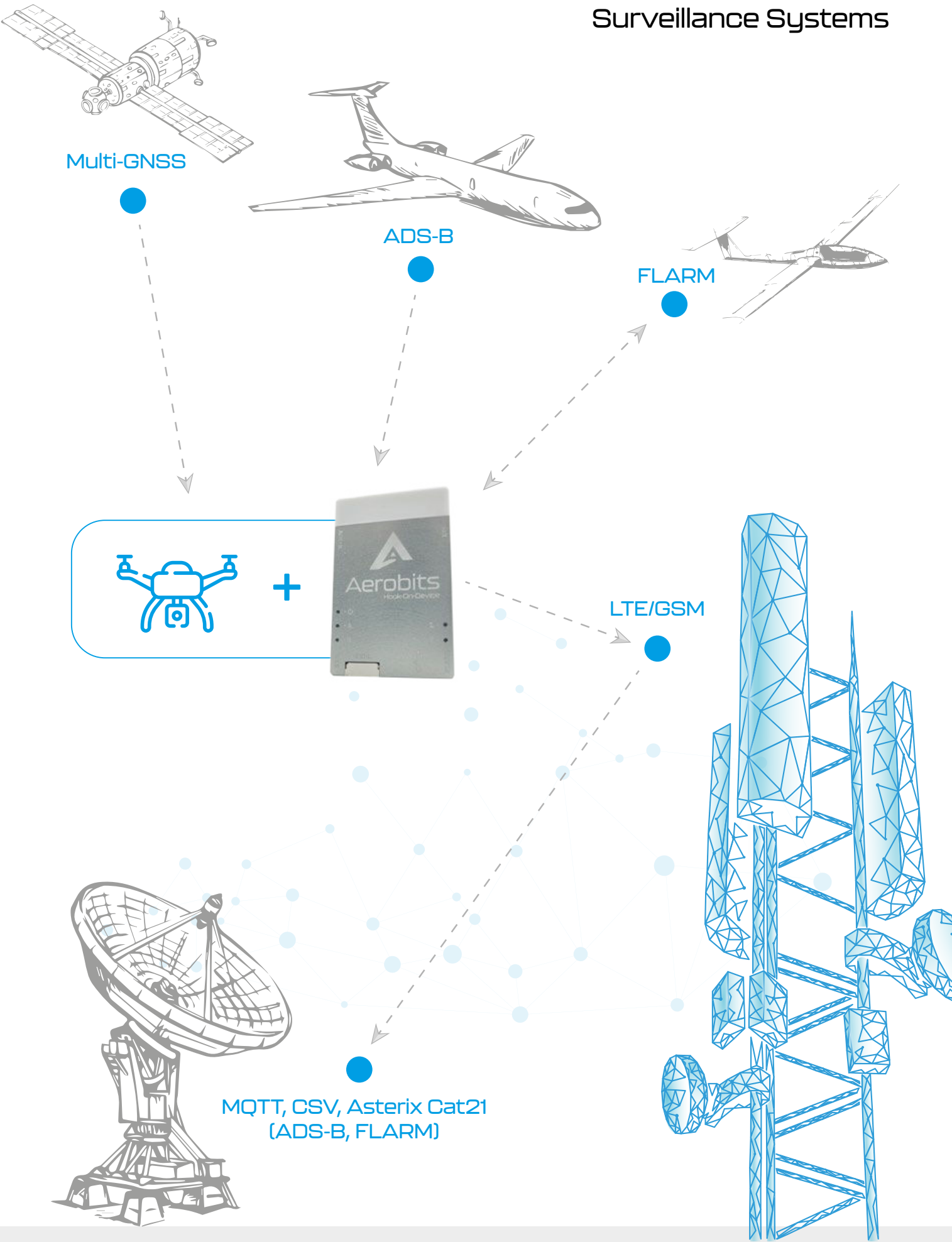
based on Aerobits products

- #LTE
- #ADS-B
- #FLARM
- #RemoteID
- #Bluetooth



Air Traffic

Surveillance Systems





Plug&Play



idME



Designed to meet requirements of remote drone identification and localization in ASTM/ASD-STAN standard.

Using the BLE broadcast technology the device provides surveillance and drone operator identification capability based on any modern mobile devices such as smartphone or tablet.

idME can be easily connected to Pixhawk controller via JST connector. For full operation, a position source (along with other parameters) is required, which is obtained directly from the MAVLink protocol.

REMOTE- ID

Features:

- Capability to work with MAVLINK devices
- BLE broadcast technology compliant with ASTM and ASD-STAN
- Interfaces: UART, USB
- Supports Bluetooth 4.0 and 5.2
- Free Android application available

Application:

- UAS >250g/open & special category
- U-Space/UTM
- Police/Special forces
- E-identification

idME+



It is equipped with a high-quality multi-GNSS receiver and a barometric altitude sensor. Designed to meet requirements of remote drone identification and localization in ASTM/ASD-STAN standard. Using the BLE broadcast technology the device provides surveillance and drone operator identification capability based on any modern mobile devices such as smartphone or tablet. It is a standalone device that requires only power supply to operate.

idME+ can be easily connected to Pixhawk controller via JST connector.

REMOTE- ID

Features:

- Standalone device
- Capability to work with MAVLINK devices
- BLE broadcast technology compliant with ASTM and ASD-STAN
- Interfaces: UART, USB
- Supports Bluetooth 4.0 and 5.2
- Free Android application available
- Integrated GNSS source and pressure sensor
- Simple plug&play integration

Application:

- UAS >250g/open & special category
- U-Space/UTM
- Police/Special forces
- E-identification

Aero



Aero belongs to the class of the smallest ADS-B receivers on market and has been developed for civil and commercial Unmanned Aircraft Systems. It is especially dedicated to UAS controllers supporting the MAVLink protocol.

Aero operates on 1090MHz and allows tracking air traffic (equipped with ADS-B technology) in the vicinity of 100 km from UAS. The goal is to ensure a safe separation between manned and unmanned aircraft. Aero opens the way to the implementation of the Detect and Avoid algorithms, supporting the integration of UAS into the airspace

ADS-B

Features:

- Real-time aircraft tracking on 1090MHz
- Designed to meet MOPS DO-260B
- Implemented MAVLink and AERO protocol
- High sensitive front-end with range up toHigh sensitive front-end with range up to 100km (300km with external 1dBi antenna)
- Programming via AT commands
- Patented FPGA-In-The-Loop technology with the capability of receiving thousands of frames per second
- Small power consumption and ultra-low weight design
- Simple plug&play integration with MAVLink devices

Application:

- On board ADS-B traffic monitoring
- Implementation of Detect and Avoid algorithms

Aero Pro



Aero Pro belongs to the class of the smallest ADS-B receivers on the market and has been developed for civil and commercial Unmanned Aircraft Systems. It is especially dedicated to UAS controllers supporting the MAVLink protocol. Aero Pro operates on 1090MHz and allows tracking air traffic (equipped with ADS-B technology) in the vicinity of 100 km from UAS. The goal is to ensure a safe separation between manned and unmanned aircraft. Aero opens the way to the implementation of the Detect and Avoid algorithms, supporting the integration of UAS into the airspace.

The device has the option of update via USB through connection to the computer. Additionally, this provides an option to visualize air traffic on Aerobits APP. Aero Pro has been designed to meet ETSI EN 303 213-5-1 V1.1.1 (2020-03) standard.

ADS-B

MODE ACS

Features:

- Real-time aircraft tracking on 1090MHz
- Designed to meet MOPS DO-260B
- Implemented MAVLink, CSV, GDL90, ASTERIX protocols
- USB port with simple firmware update capability
- High sensitive front-end with range up to 100km (300km with external 1dBi antenna)
- Programming via AT commands
- Patented FPGA-In-The-Loop™ technology with the capability of receiving thousands of frames per second
- Small power consumption and ultra-low weight design
- Simple plug&play integration with MAVLink devices
- Dedicated software available

Application:

- On board ADS-B traffic monitoring
- Implementation of Detect and Avoid algorithms



TR-1W



TR-1W belongs to the class of the smallest ADS-B transceivers on market and has been developed for civil and commercial Unmanned Aircraft Systems. The device operates on 1090MHz band and allows to receive and transmit ADS-B data with 1 Watt output power.

The transceiver does not require any external devices to operate. It is equipped with a high quality multi-GNSS receiver and a barometric altitude sensor. The aluminium housing and ESD protection guarantee high resistance of the device to work in rugged environment.

ADS-B GNSS PRESSURE SENSOR

Features:

- Real-time aircraft tracking on 1090MHz band
- Patented FPGA-In-The-Loop™ technology with the capability of receiving thousands of frames per second
- Integrated high quality GNSS position source and barometric altitude sensor
- 1W RF output power
- Implemented MAVLink and AERO™ protocol
- Low-power and low-weight design
- Simple plug&play operation
- Programmable via AT commands
- Designed to meet MOPS DO-260B (except the output power)
- Dimension: 45.5x28.0x10.0mm

Application:

- On-board traffic monitoring
- Position broadcasting
- Implementation of Detect and Avoid algorithms

TR-1A



TR-1A belongs to the second generation of the smallest ADS-B transceivers on market and has been developed for civil and commercial Unmanned Aircraft Systems (weight and size reduced by 33% compared to TR-1W).

The device operates on 1090MHz and allows receiving and transmit ADS-B data with defined 0.25, 0.5 or 1 Watt output power. The transceiver does not require external devices to operate. It is equipped with a high-quality multi-GNSS receiver and a pressure sensor.

ADS-B GNSS PRESSURE SENSOR

Features:

- Real-time aircraft tracking on 1090 MHz band
- Patented FPGA-In-The-Loop technology with the capability of receiving thousands of frames per second
- Integrated high quality GNSS position source and barometric altitude sensor
- 0.25, 0.5 or 1 Watt RF output power
- Implemented MAVLink and AERO protocol
- Low-power consumption and low weight design
- Simple plug&play operation
- Programming via AT commands
- Designed to meet MOPS DO-260B (except the output power)
- Dimension: 35.0 x 25.0 x 8.5mm

Application:

- On-board traffic monitoring
- Position broadcasting
- Implementation of Detect and Avoid algorithms

TR-1F



TR-1F belongs to the generation of the smallest transceivers on market and supports two technologies: ADS-B and FLARM. It has been developed to support civil and commercial Unmanned Aircraft Systems as well as General Aviation. The device operates on 1090MHz and 868 MHz and allows receiving and transmit ADS-B and FLARM data with defined 0.25, 0.5 or 1 Watt output power for ADS-B and 0,025 Watt for FLARM.

ADS-B FLARM GNSS PRESSURE SENSOR

Features:

- Real-time aircraft tracking on 1090MHz and 868 MHz band
- Patented FPGA-In-The-Loop technology with the capability of receiving thousands of frames per second
- Integrated high quality GNSS position source and barometric altitude sensor
- 0.25, 0.5 or 1 Watt RF output power for ADS-B
- Licensed FLARM transceiver (0.025 Watt output power)
- Implemented MAVLink and AERO protocol
- Low-power consumption and low weight design
- Simple plug&play operation
- Programming via AT commands
- Designed to meet MOPS DO-260B (except the output power)
- Dimension: 35.0 x 25.0 x 8.5mm

Application:

- On-board traffic monitoring
- Position broadcasting
- Implementation of Detect and Avoid algorithms

The HOD



The Hook-On-Device (HOD) for UAS and other aircraft (such as helicopters) to transmit their own position data. Thanks to its low weight, the HOD can be attached to any aircraft.

It contains an LTE modem with SIM card. The device transmits its current GNSS position via LTE to the UAS Traffic Management (UTM) system. The device is capable of receiving FLARM and ADS-B from surrounding air traffic and sending this data additionally to its own position to the UTM system. The UAS operator receives the UAS own position and the position data of other relevant air traffic in the vicinity via the web based UTM system.

ADS-B LTE FLARM GNSS

Features:

- Connectivity: 4G LTE Cat1, GNSS, ADS-B, FLARM - wide band/multi-constellation/1090 MHz/868MHz
- LTE modem to track aircraft via LTE
- Internal antennas: Built-in LTE antenna can be activated optionally
- External antennas: LTE, GNSS, FLARM and ADS-B antennas
- Compatible with all FLARM systems in aircraft and UAS
- Licensed FLARM transceiver (0.025 Watt output power) - broadcasting its own position
- Barometric sensor on board
- Simple plug&play integration
- Programming via AT commands
- Dimension: 58 mm x 38 mm x 9.5 mm

Application:

- On-board traffic monitoring
- Position broadcasting
- Implementation of Detect and Avoid algorithms
- UTM/U-Space
- UAS Tracking



Ground Infrastructure

Ground Infrastructure category includes solutions which allow to build or prototype UTM and ATM networks, based on ADS-B and FLARM technologies. With use of LTE and/ or PoE technologies it is possible to design a network for each use case.

Products vary from small single PC computers, through Omni-directional system to state-of-the art Sector Antennas for best performance with minimum effort to install and run the system.

Short and clear instructions will help you how to quickly integrate into your existing system whether it is for drone integration, air traffic monitoring or supplementary systems such as BNK projects.



Diverse networkable solutions for future UTM/U-Space design



Product	Aero RPi Hat	Mobile Ground Station	Omni-directional Ground Station	Sector Antenna
WEIGHT [G]	45	500	2500	13000
DIMENSIONS [MM]	85.6 × 56.5 × 17	130 × 175 × 45	270 × 270 × 100	1290 × 290 × 134
ADS-B (IN)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
LTE	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VIEW	Omni-directional	Omni-directional	Omni-directional	Sector
OVERAL ADS-B SENSITIVITY; ANTENNA GAIN INCLUDED (DBM)	-88 (antenna 1dBi)	-89 (antenna 5dBi)	-95 (antenna 5dBi)	-100 (antenna 13dBi)
OVERAL FLARM SENSITIVITY; ANTENNA GAIN INCLUDED (DBM)	<input type="checkbox"/>	-112 (antenna 8dBi)	-115 (antenna 8dBi)	-119 (antenna 13dBi)
FIXING	Mobile	Mobile	Fixed	Fixed
FLARM IN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GNSS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TIMESTAMP (MLAT DATA SOURCE)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



Ground Infrastructure

Aero RPi Hat



The product integrates Micro ADS-B and GNSS technologies with the most popular single board computer in the world. This allows easy access to data collected by the TT-MC1 module.

Aero RPi Hat offers the possibility of receiving and decoding ADS-B and Mode-A/C/S. The integration of GNSS technology allows marking frames with an accurate timestamp for multilateration purposes. It is possible to connect Dongle LTE/GSM via a USB port.

ADS-B MODE A/C/S GNSS

Mobile Ground Station



Mobility

The MGS-01 station combines LTE, GNSS, ADS-B and FLARM technologies in a very convenient form. It has been designed to allow quick and easy assemble.

Packed in a very nice and sturdy case, comes with all necessary cables and antennas for straightforward installation which takes less than 5 minutes.

It is a perfect solution if you are conducting many VLOS/BVLOS operation in different places where safety is critical.

ADS-B FLARM GNSS LTE

Features:

- Powered via standard USB connector or via POE
- Based on TT-MC1a 1090MHz receiver
- Integrated GNSS with additional USB connector
- Precise time-stamping of raw frames
- Integrated temperature and air quality sensor
- Availability in different configurations
- Total power consumption - approx. 3.7W

Application:

- Ground stations
- UTM/USpace proof of concepts
- Data collecting

Features:

- Perfect for remote operations
- ADS-B range ca. 350 km and FLARM ca. 15 km (dependent on correct positioning)
- LTE connectivity
- Easy installation
- All necessary components in the box (mounting kit, GNSS and LTE antennas, cables etc.)
- Durable and watertight construction designed to work in harsh environment
- Dedicated software available for visualization

Application:

- Perfect solution for local airfields
- U-Space and UTM systems
- Ground Network air traffic surveillance systems
- Easy to pack
- Can be powered from 5V power supply i.e. power bank

Omni-directional Ground Station

For small air traffic



OGS station is an ADS-B and FLARM Omni-directional receiver station with multi-constellation GNSS sensor to provide best accuracy. LTE connectivity allows usage in all LTE/3G rich environments without the need for any additional cabling to send data. It has been designed to allow quick and easy assemble enclosed in IP67 case for high weather condition resistance.

Device comes with all necessary cables and antennas for straight forward installation. It is a perfect solution for permanent installation in open areas for constant airspace monitoring and conducting VLOS/BVLOS operation where safety is critical.

ADS-B FLARM GNSS LTE

Sector Antenna

For big air traffic



This antenna is a 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 easily networkable using LTE connectivity and is optimized to work in a harsh environments. Apart from drone technology, the antenna can be used in manned traffic surveillance, ADS-B.

ADS-B FLARM GNSS LTE

Features:

- High gain antenna for airspace monitoring perfect for U-Space applications
- ADS-B range ca. 400 km and FLARM ca.40 km (dependent on correct positioning)
- LTE connectivity
- Easy installation
- All necessary components in the box (mounting kit, GNSS and LTE antennas, cables etc.)
- Durable and water tight construction designed to work in harsh environment
- Dedicated software available for visualization

Application:

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

Features:

- Single piece sector antenna for FLARM and ADS-B
- High gain antenna for airspace monitoring perfect for U-Space applications
- ADS-B range ca. 450 km and FLARM ca.70 km (dependent on correct positioning)
- LTE connectivity
- Easy installation
- All necessary components in the box (mounting kit, GNSS and LTE antennas, cables etc.)
- Durable and water tight construction designed to work in harsh environment
- Dedicated software available for visualization

Application:

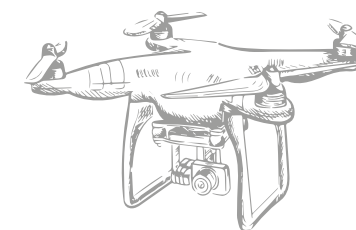
- Airports and critical infrastructure
- Nationwide traffic management systems (manned and unmanned)
- Perfect solution for local airfields
- U-Space and UTM systems
- Ground Network air traffic surveillance systems



Our current global reach

We are honored to provide products
and support to our customers.

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49 countries
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