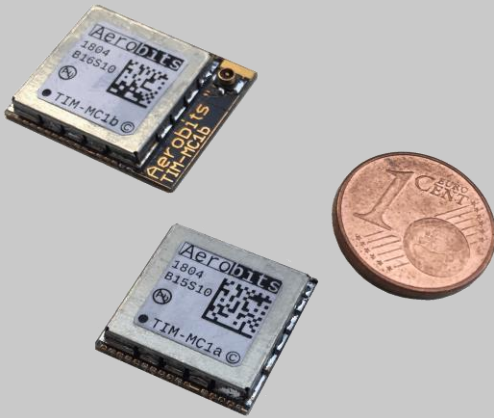


# TIM-MC1 series

(Basic Information)



TIM-MC1 is a high-performance OEM series dedicated especially for ground stations. It offers high-speed ADS-B and Mode A/C/S implementation with RF receive power analysis and time stamps for multilateration. Simultaneous miniaturization of the module and its OEM nature open a wide range of possible applications.

## Features

- **FPGA-In-The-Loop** technology for the fastest ADS-B implementation on a surface of ~4cm<sup>2</sup>
- High-resolution ADC with real-time signal processing based on an adaptive algorithm; **best-in-class aircraft tracking**
- **ADS-B and Mode-A/C/S** with a capability of receiving thousands of frames per second
- **RF power measurement** for each frame (useful for distance estimation in case of Mode-A/C/S)
- Time stamp for each frame for **multilateration**
- High sensitive front-end (jamming and ESD protection) with **ranges over 300 km** (1dBi antenna)
- Simple module integration - programming using UART and **AT commands**
- Many interfaces available: UART(standard), USB, SPI, CAN, I2C
- Scalable OEM solution with enormous customization potential eg. **ADS-B/Out (digital)**
- Power supply 3.3V/5V, current 220mA
- Designed to meet the requirements of TSO-C199
- Small outline (a): 18.0 x 19.0 x 2.5mm (1.8g weight)
- Small outline (b): 22.5 x 19.0 x 2.5mm (2.0g weight)
- **Evaluation board available**

## Applications

- **SAA/DAA** (Sense and Avoid / Detect and Avoid)
- Mobile and stationary **traffic surveillance**
- Ground infrastructure with **multilateration**
- **Traffic-flow** analysis and statistics
- For **UTM / U-Space** construction, systems that meet the **NextGen / SESAR** philosophy

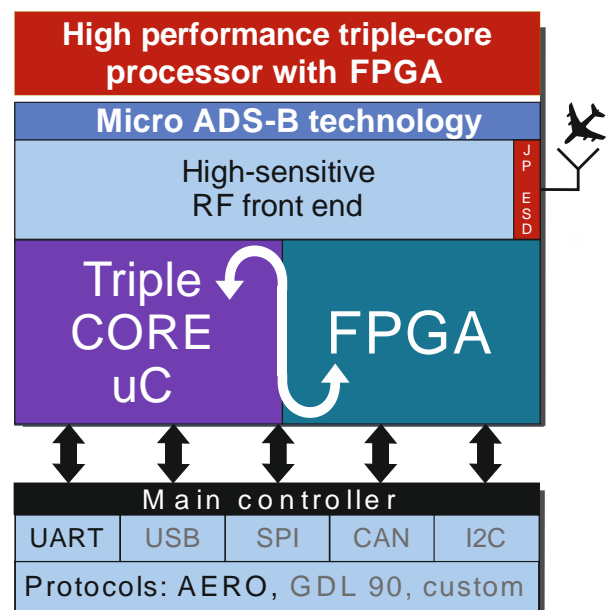


Fig. 1 Hardware block diagram.

Basic Electrical Specification					
Parameter	Description	Min.	Typ.	Max.	Unit
Carrier frequency		-	1090	-	MHz
RX sensitivity	For operation at 50Ω (U.fl connector ver.b)	-	-90	-	dBm
Power supply 1	Digital part	3.0	3.3	3.6	DCV
Power supply 2	RF part	4.0	5.0	5.5	DCV
Current consumption		-	220	-	mA

Tab. 1 Basic electrical specification.

About 20 AT commands are used for simple communication with the module. There are 3 types of commands: *execute*, *write value* and *read value*. Some of commands are marked as settings “S”. It means that the parameter is non-volatile, and it is stored in internal memory. Typical responses of the module are “AT+OK” and “AT+ERROR (description)”.

Output example of AERO protocol:

```
#C: 55.9, 591, 140056, E789
#G: 52.47116, 13.39779, 42, 5, 1EB8
#M: A4FA49, , , , , , , , , , 700, 2, 67A2
#A: 3C0A45, , EWG9YH, 2550, 51.52670, 14.11587, 37000, 102, 490, 0, 116.597, 700, 1565, B1E8
#A: A954CA, , CKS205, 1000, 50.57259, 12.79625, 40000, 296, 453, 0, 215.711, 725, 1606, 9114
#A: 45AC4C, , SAS48K, 6644, 52.55967, 11.94991, 36000, 8, 495, 0, 99.154, 825, 3738, 1D7A
#A: 3C66AB, , DLH9WY, 7350, 53.17250, 10.69362, 36975, 26, 530, 0, 198.203, 750, 1648, BA3
#M: 3C4D66, , , , , , , , , , 700, 1, 8622
```

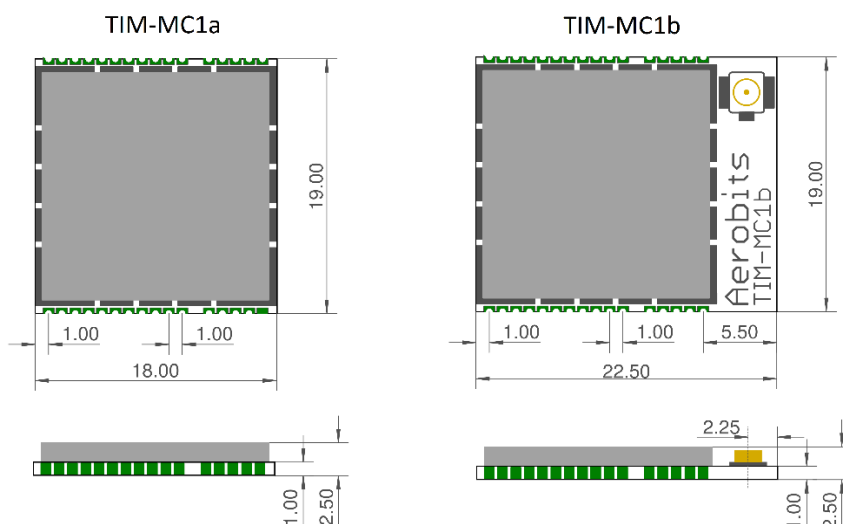


Fig. 2 Mechanical drawing (all dimensions in mm).

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