

# MCU500e

## AVL and Telematics Unit

The MCU500e is a small and cost-effective AVL and telematics unit with integral GPS that is suitable for a wide range of applications, particularly those involving high integrity or mission critical usage.

The MCU500e is the latest development in the line of low-cost mobile control units for use on digital wireless networks from Thorcom. Whilst the MCU500e is the smallest external AVL product manufactured by Thorcom, it still maintains class-leading performance, functionality and network flexibility, combined with low power consumption.

Using the latest GPS technology to log second-by-second position data, the MCU500e typically achieves a position fix accuracy of better than 10 metres. Additional information, such as speed, heading and up to 6 other telematics inputs allows the MCU500e to log a wide range of supplementary vehicle data. The MCU500e then uses a 'Smart' dynamic AVL event engine to send key-point data in real-time over the air. The smart AVL engine can be fine tuned to offer an individually tailored vehicle location service, without the risk of overloading wireless network or incurring high airtime costs.

By compressing the AVL data, the MCU500e optimises the use of the wireless network, enabling the carrier to work at its most efficient packet size. At the centre, Thorcom provides a complete system solution, including a flexible multi-bearer capable AVL gateway and an AVL management system. The total solution includes a scalable, fully featured mapping application suitable for use in the UK or on a Worldwide basis.

The MCU500e stores the 1-second resolution position GPS fixes in its on-board non-volatile memory. In the event of an incident, this history log can be interrogated to show exact vehicle data in the immediate period leading up to the incident, including all the connected vehicle telematics data.

Migration and/or upgrade between bearer types is supported by Thorcom by changing the firmware held in the internal FLASH memory within the MCU500e. This offers the user the ability to support several different wireless technologies within a large fleet, and future-proofing to allow the support of next-generation wireless technologies as they are rolled out.

### MCU500e key features

- Mobile Control and AVL unit for digital bearers
- Wide range of digital bearers supported, including TETRA, GPRS and MPT1327
- Multiple telematics inputs and output
- SmartAVL engine
- Black-box flight recorder
- Intelligent Power Up/Down Control
- Very lower power consumption
- FLASH re-programmable for easy field upgrades
- Backward compatible with MCU500 unit

### Applications for MCU500e

- AVL and telematics for Emergency Services (Police, Fire and Ambulance)
- Security Services
- Local Authorities
- Vehicle Tracking
- High value goods/MIP tracking and guarding

### Supported AVL Bearers

- TETRA via SDS using RS232 PEI or TNP/1
- GPRS via UPD/IP using PPP
- MPT1327 Trunking using SST via MAP27

### Supported Wireless Manufacturers

- TETRA: Motorola, Sepura, Nokia and Cleartone
- GPRS: Siemens
- Trunking: Team Simoco, Tait, Motorola



"The MCU500e provides a flexible, low-cost mobile tracking and telematics solution for high integrity system users and special-purpose networks."

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## AVL and Telematics Unit

### Technical Specifications

#### MCU Processor

CPU Zilog Z80182 operating at 29.5MHz

Memory 512Kb Flash PROM 29F040 (operating firmware)

512Kb Static RAM main memory (battery backed)

2Kb I2C-bus NV-RAM (system configuration)

#### Serial Communication Ports

Port 1 RS232/CCITT V.24 7-wire interface, RJ45 connector

Port 2 RS232/CCITT V.24 7-wire interface, RJ45 connector

#### Digital Input/Output

Inputs 4 x general purpose inputs (active high or low)

2 x special inputs (Ignition and Alarm)

Outputs 1 x 10A DPDT switching relay

3 x Open Collector switching transistor (Imax=100mA)

#### Status LEDs

4 x LEDs indicating Power on/off, Network Service, GPS operation and message transmission

#### GPS receiver

Type Trimble(tm) ACE-III 8-channel GPS receiver

Antenna 26dB active antenna, 4.5V DC phantom power (see ordering options)

#### Power Supply

Voltage +10 to 18 VDC

Consumption 150mA @ 13.8V (2.1 Watts)

Backup 3.7V Lithium battery >10 year life

Intelligent power up and power down

#### Connectors

I/O & Power 12-way Molex Minifit Junior

Serial RJ45 connectors x 2

GPS SMB 50 ohm RF connector

#### Enclosure

Case Aluminium enclosure, IP54 rated

Size 108mm (W) x 154mm (D) x 32mm (H)

Weight 330 grams

#### Environmental

Temp 10 to +55 Celsius

Humidity 0 to 90% non-condensing

EMC CE marked to 89/336/EEC (EN 310 489) and 'e' marked to Vehicle EMC directive 95/54/EEC

### Product Variants

The standard MCU500e vehicle locator is supplied for in-vehicle mobile operation, ready for configuration and for use with a separate wireless device (TETRA terminal, GPRS module, or MPT1327 radio).

Thorcom is also able to supply complete installation kits, including power cabling, data leads and antenna (both GPS and Digital Bearer antennas). For GPRS users, the GPRS module can be included in the kit provided by Thorcom.

### MCU500e for TETRA

The MCU500e combined with a suitable TETRA terminal creates a powerful AVL and telematics solution for use on TETRA networks. The MCU500e bearer port implements the ETSI standard PEI (Peripheral Equipment Interface) and supports the slight PEI implementation variances found across different manufacturers.

The MCU500e has been tested and approved by Thorcom with TETRA terminals from Motorola, Sepura, EADS (Nokia) and Cleartone. It has Airwave conformance for use on the Airwave TETRA network in the UK.

### MCU500e for GPRS

For use on GPRS networks, the MCU500e is supplied with factory-fitted firmware suitable for use with GPRS terminals, and when combined with a suitable GPRS terminal, a very cost-effective and flexible AVL and telematics solution is produced. The MCU500e bearer port implements standard UDP/IP over a local PPP connection to the GPRS terminal. The MCU500e has been tested and approved by Thorcom with the Siemens range of GPRS terminals for use in UK, European and Worldwide markets.

### MCU500e for MPT1327 Networks

For use on MPT1327 networks, the MCU500e implements the standard MAP27 data protocol to the radio. The MCU500e has been tested and approved by Thorcom with the MPT1327 radios from all the major radio manufacturers that use the MAP27 protocol.