



TRAIN ON-BOARD UNIT

The **Train On-Board Unit (TR-OBU)** is a versatile integration platform for in-train applications. The system is made up of an Interface Unit, a Main Unit and application specific modules.

Interface Unit

The system is controlled via a 7" touch screen Interface Unit. A wide viewing angle and configurable brightness ensure excellent visibility in all conditions and external buttons are easily configured for enhanced interaction.

Main Unit

The Main Unit provides an interface among the communication node, the operation centre, and any on-board devices. Depending on the requirement, dedicated interfaces can be provided including:

- Up to two data GPRS/EDGE/UMTS/HSxPA/LTE and GPRS voice modems for voice and data transmission
- 10/100Mbps Ethernet Interfaces
- Standard POE 802.3af
 - Up to 8x IP channels (up to 4 POE)
 - Up to 12x IP channels 4 POE + 4 10/100 Mbps+ 4 10/100/1000
- 4 configurable RS-232/RS-485/RS-422 ports are available for connection to external devices
- Wi-Fi 802.11a/b/g/n for wireless devices integration.

KEY FEATURES

- Automatic Vehicle Monitoring and Fleet Management
 - TR-OBU enables accurate vehicles position tracking by utilising satellite signals (GPS, with software configurable EGNOS support, as option GALILEO and GLONASS positioning system) and dead-reckoning correction, in case of lack of signal
- Communication
 - The platform offers data, messaging and voice call functionalities for on-board-centre, centre-on-board and on-board-on-board communications
- Passenger Information Display Systems (PIDS)
 - Native text-to-speech engine for notice to passenger through integrated audio system
 - Integration with external PIDS (i.e. Ameli, Aesys, etc.) for real-time passenger information
- Security Video Surveillance
 - Video surveillance module for A/V recording
- Ticketing
 - Ticketing appliance
- Driver Access Control
 - By using smartcard with different profiles
- Passenger Counter System
 - By using POE IP Cameras

TR-OBU

Mobile Video Recorder (MVR)

As an option, the Mobile Video Recorder (MVR) video surveillance module can be hosted in the Main Unit for recording and streaming of audio/video data streams. MVR can manage more than 60 real-time audio/video channels at various resolutions and frame rates with live streaming functionality on RTP/RTSP protocols (Real-Time Transport Protocol/Real-Time Streaming Protocol).

Audio/Video data can be recorded on an internal hard drive with privacy guaranteed by the high security AES/Rijndael encryption algorithm.

Alarm management allows users to configure the automatic response action following a specific event. For instance, one can decide to start a video recording, to show a text alarm on the video or to mark the recordings for easy retrieval. MVR can be connected to an external colour monitor in order to display images coming from the installed cameras.

CONFIGURATIONS

Several TR-OBU functionalities are available by combining the following base configurations:

- Automatic Vehicle Monitoring (AVM)
- Communications
- Passenger Information Display System (PIDS)
- Mobile Video Recorder (MVR)
- Ticketing
- Driver Access Control
- Passenger Counter

TECHNICAL DATA

HARDWARE	
Cooling system	Totally fan-less
Case material	Aluminum
Operative temperature	-40°C to +70°C (-40°F to 158°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Operating humidity	Up to 95% not condensing
Input Voltage	110V DC
Power	<150W
Size (width x height x depth)	200 x 120 x 280 mm (7,87 x 4,72 x 11,02 in)
Weight	4,5 kg (max) (9,92 lb)
Connector type	M12-D, M12-X, DBx
PROCESSOR/MEMORY	
CPU	IMx6 QuadCore a 800 MHz (automotive range)
RAM	1GB RAM
Flash Disk	8GB eMMC
HDD	up to 2TB SATA 2.0 disk (expandable)
Operating System	Linux to enable real-time application

INTERFACES I/O	
Wi-Fi	802.11a/b/g/n/ac AP/Client mode
3G/4G	Up to 2 module UMTS/HSPA/LTE
Ethernet	Ethernet Interface 10/100Mb/s Standard POE 802.3af. 4 ports Ethernet interface 10/100Mb/s 802.3 4 ports Ethernet interface 10/100/1000Mb/s 802.3 4 ports
Ports I/O	4x configurable ports (RS-232/RS-485/RS-422) 2x USB 2.0 4x digital inputs plus 4 digital output 2x digital I/O 2x CAN ports
Satellite	GPS signal accuracy ± 1.5m, better with EGNOS support
Optional satellites	GALILEO positioning service GLONASS positioning service
Audio	2x analog input 2x analog output at 1.5W/line 3x analog class D output at 20W/line Audio Matrix
Video	HDMI and LVDS connections to external display

TETRA	
Interface	Interfacing external standard TETRA devices via std. serial PEI

CERTIFICATION COMPLIANCE	
CE marking	Compliant to Directive 2014/53/EU
EN 50155	Directive compliant
ROHS	Directive compliance 2011/65/UE
Operating temperature	-40°C to +70°C (80°C for 10 minutes) (176°F)
Vibrations	Compliant to technical rules CEI EN 60068-2-6 (2g value), CEI EN 60068-2-64 (0.1g ² /Hz value)
Shock	Compliant to technical rule CEI EN 60068-2-27 (5g value), compliant to EN 61373
IP protection	IP 65

MVR FEATURES	
Video surveillance capture	Up to 12 channels (even more, if available on the network) at various resolutions and frame rates Dynamic text insertion (date, time..., GPS)
Video	Supported recording formats: MPEG4/H264/H265/ MJPEG, H264 encryption on disk
Streaming	Unicast and multicast over RTP recording and extracting Circular buffers for permanent recording Streaming of recorded videos Extraction of sequences (standard container)
Configurability	Onvif 2.2 compliancy
Remote control and maint.	Built in web server and upgradeable firmware via network
Security	AES Data encryption with a 128/256 bit key Login with user name and password via secure protocol (HTTPS) Portable HDD protection with double password

ADDITIONAL FEATURES	
Software Suites	AVM, OBC, PIS, MVR, PCS, CAN, SDK