

TR-OBU

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.

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-OBUs 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

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TECHNICAL DATA

Hardware	
Cooling system	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)
Operative humidity	up to a 95% not condensing
Input Voltage	110V DC
Power	<150 W
Dimensions (HxWxD)	120x200x280 mm [4,72 x 7,87 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	8GB eMMC
Hard Disk	up to 2TB SATA 2.0 disk (expandable)
Operating System	Linux 4.15 to enable real-time application
Communications	
Wi-Fi	802.11a/b/g/n/ac AP/Client mode
3G/4G	Up to 2 module UMTS/HSPA/LTE
Ethernet	<ul style="list-style-type: none">• 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
Satellite	<ul style="list-style-type: none">• GPS signal accuracy ± 1.5m, better with EGNOS support• GALILEO Positioning Service (option)• GLONASS Positioning Service (option)
I/O Interfaces	
I/O Ports	<ul style="list-style-type: none">• 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)
Video	HDMI and LVDS connections to external display
Audio	<ul style="list-style-type: none">• 2x analog input• 2x analog output at 1.5W/line• 3x analog class D output at 20W/line• Audio Matrix
TETRA	
Interface	Interfacing external standard TETRA devices via standard serial PEI
MVR (Mobile Video Recorder)	
Video surveillance capture	<ul style="list-style-type: none">• Up to 12 chs (even more, if available on the net) at various res. and frame rates.• Dynamic text insertion (date, time..., GPS)
Video Streaming	Supported rec. formats: MPEG4/H264/H265/ MJPEG, H264 encryption on disk <ul style="list-style-type: none">• 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 maintenance	Built in web server and upgradeable firmware via network
Security	<ul style="list-style-type: none">• 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
Certification Compliance	
CE marking	<ul style="list-style-type: none">• Compliant to Directive 2014/53/EU
EN 50155	Directive compliant
ROHS	Directive compliance 2011/65/UE
Vibrations	Compliant to technical rules CEI EN 60068-2-6 (2g value), CEI EN 60068-2-64 (0.1g2/Hz value)
Shock	Compliant to technical rule CEI EN 60068-2-27 (5g value), compliant to EN 61373
IP Protection	IP 65
Additional features	
Software suite	AVM, OBC, PIS, MVR, PCS, CAN, SDK

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