



CUTTING-EDGE ELECTRONICS FOR ROLLING STOCK AND PUBLIC TRANSPORT

ELECTRONICS FOR ROLLING STOCK AND PUBLIC TRANSPORT

AMiT is dedicated to the **development and production of cutting-edge electronics for transportation**, with a primary focus on rail vehicles. Our highly skilled team crafts comprehensive automation solutions, positioning itself as a crucial partner in the design and implementation of major projects within the transportation sector.



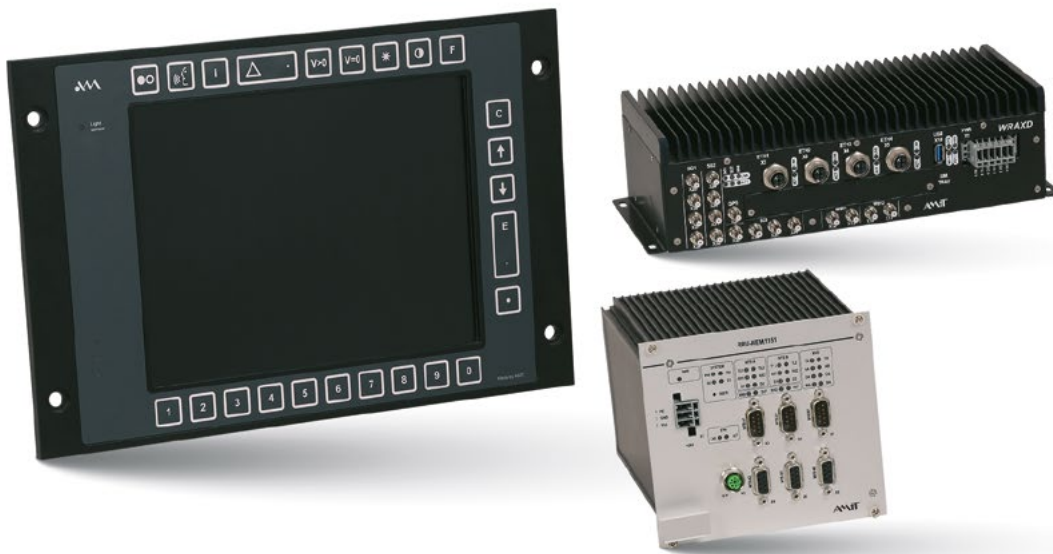
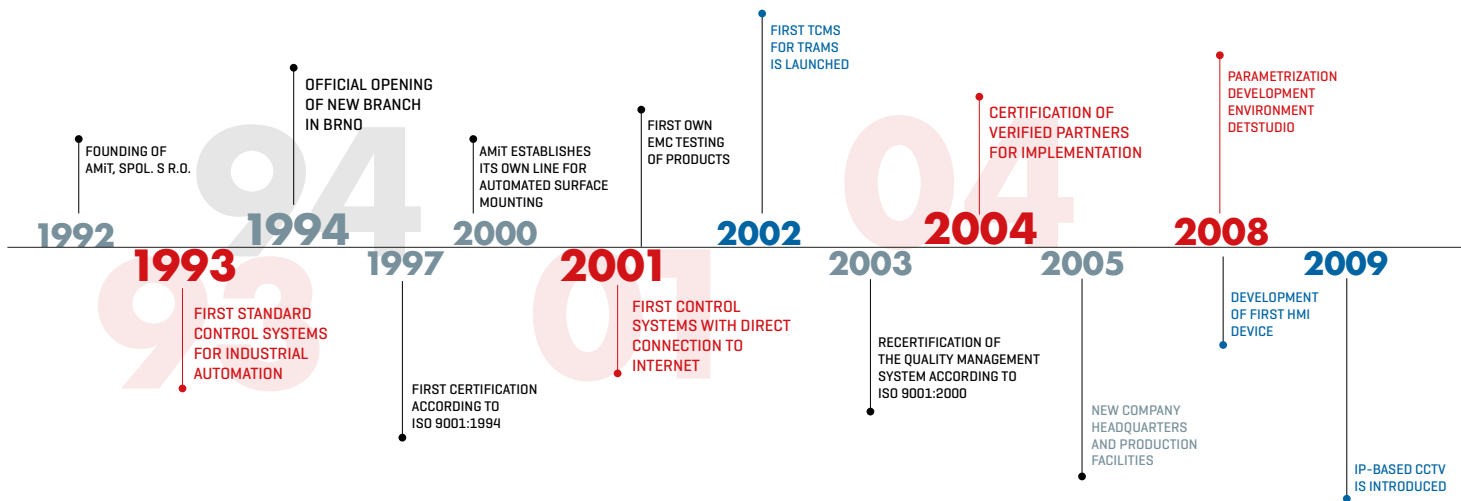
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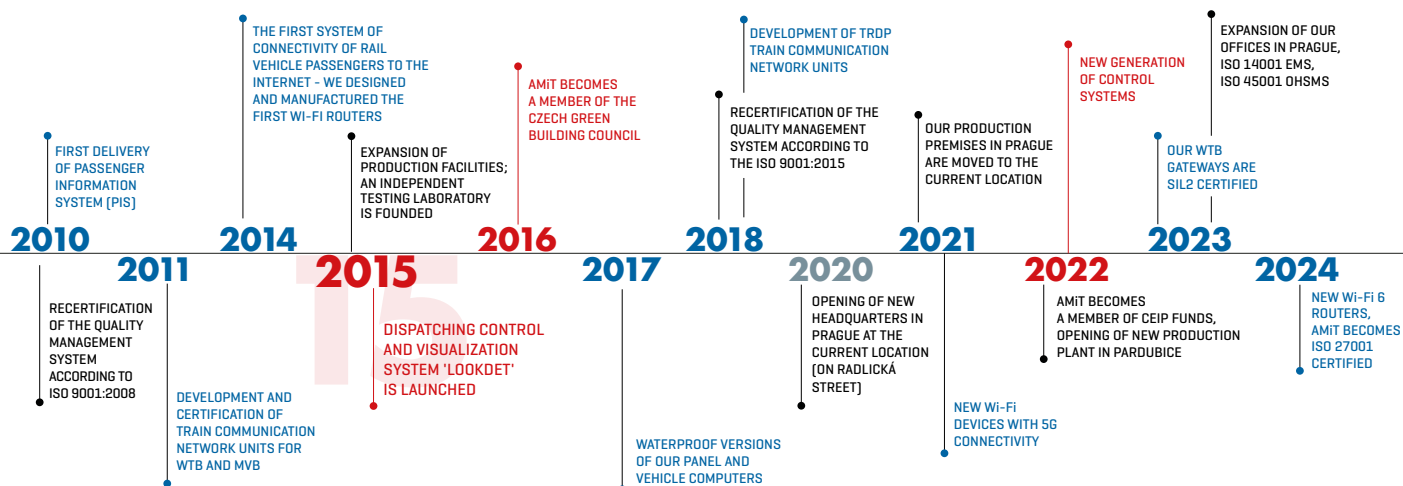
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PLAY VIDEO ►



You can find our projects on **5 continents and in 58 countries**.
We have installed more than **258,125 products**.

AMiT

TRANSPORTATION

We become among the most important players in the area of development and manufacture of control systems and electronics for transport, particularly for railway and rolling stock. Our assets are based primarily on own know-how and development, advanced manufacture and a professional approach to customers.

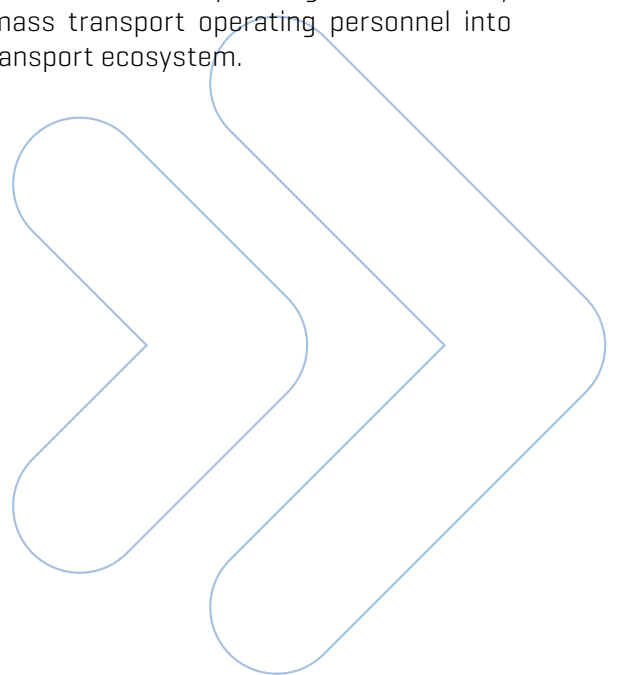
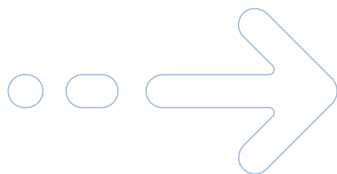
Our product offer is rare in the world in its complexity and scope; it includes information systems for passengers, IP surveillance and audio systems, TCN communication, communication infrastructure and on-board control systems, which fulfil customers' requirements and of course international general [EN] and technical [UIC] standards.

VISION

We want to become both a reliable supplier in the rail and rolling stock industry, and a respected partner the quality in electronic engineering, manufacturing and services. In relation to employees, we support their togetherness with the company, as well as increasing their responsibility for all of the company's successes and business results.

MISSION

Our mission is to discover, develop and deliver reliable, smart and cost-performance efficient products, applications and complex solutions for rolling stock and public transport, and to interconnect vehicles, passengers and railway and mass transport operating personnel into the transport ecosystem.



APPLICATION:

**CARRIAGES
(RIC)**

**COMMUTER
TRAINS**

**HIGH-SPEED
TRAINS**

LOCOMOTIVES

METRO

TRAMS

HOW WE DO IT:



COMPLETE SOLUTION

We offer comprehensive and customized solutions to meet our customers' needs.



QUALITY TECHNICAL SUPPORT

The technical support department is available to all our customers.



CUSTOMIZED SOLUTION

Each order is essentially tailor-made, and we have vast experience with this approach.



OBSOLESCENCE MANAGEMENT

We ensure the continuity and operational reliability of our systems along with the optimization of maintenance costs.



TESTING LABORATORY

We conduct pre-certification tests according to the standards ČSN EN 61326-1, ČSN EN 50121-3-2, and ČSN EN 50155.

PRODUCT PORTFOLIO OVERVIEW



HMI

COMPUTERS



AUDIO

UIC AUDIO GATEWAYS

MICROPHONES

AUDIO AMPLIFIERS

AUDIO DIGITIZERS

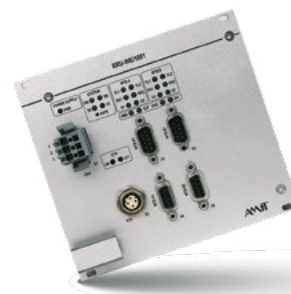


CCTV

RECORDING UNITS

CAMERAS

CAMERA COVERS



TCN

GATEWAYS

MODULES

ANALYZERS

RELIABLE PRODUCTS FOR SAFER AND GREENER ROLLING STOCK



TFT



LED



OLED

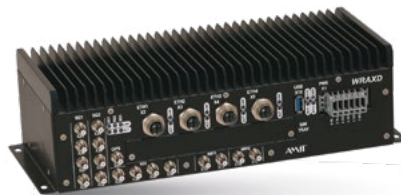
DISPLAYS



INTERCOMS



MICROPHONES



WI-FI

ROUTERS



ACCESS POINTS

AUDIO



CONVERTERS

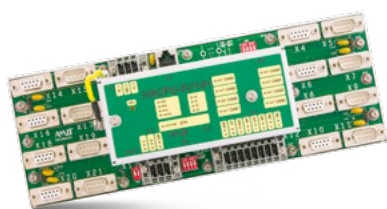


SWITCHES



ROUTERS

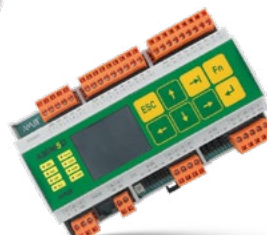
ETHERNET



VEHICLE CONTROL UNITS



I/O UNITS



PLC UNITS



FUSE MODULES

TCMS

PASSENGER INFORMATION SYSTEM [AMiT PIS]

IC 557 - ZÁPADNÍ EXPRES
Cheb — Praha hl.n.

Plán	Výchozí stanice
08:33	Cheb
Plán	Další stanice
09:04	Planá u Mar.Lázní
09:26	Stříbro
09:48	Plzeň-Jižní Předm.
09:52	Plzeň hl.n.
11:15	Praha-Smíchov
11:23	Praha hl.n.



- Comprehensive Passenger Information System
- Easy to integrate
- Adaptable to suit individual requirements
- Ensuring a high standard of information at low operational cost
- IP network standardized system
- Extensive experience
- EN 50155 compliant

AMiT offers wide range of products and systems, from basic core solution of simple passenger announcement functions to complex solutions according to customer's choice.

Components of PIS

Control Units / HMI

PVS - Passenger Visual System

PA / EI - Audio Systems

SRS - Seat Reservation Systems

CCTV - Surveillance Systems

PWLAN - On-board Wi-Fi

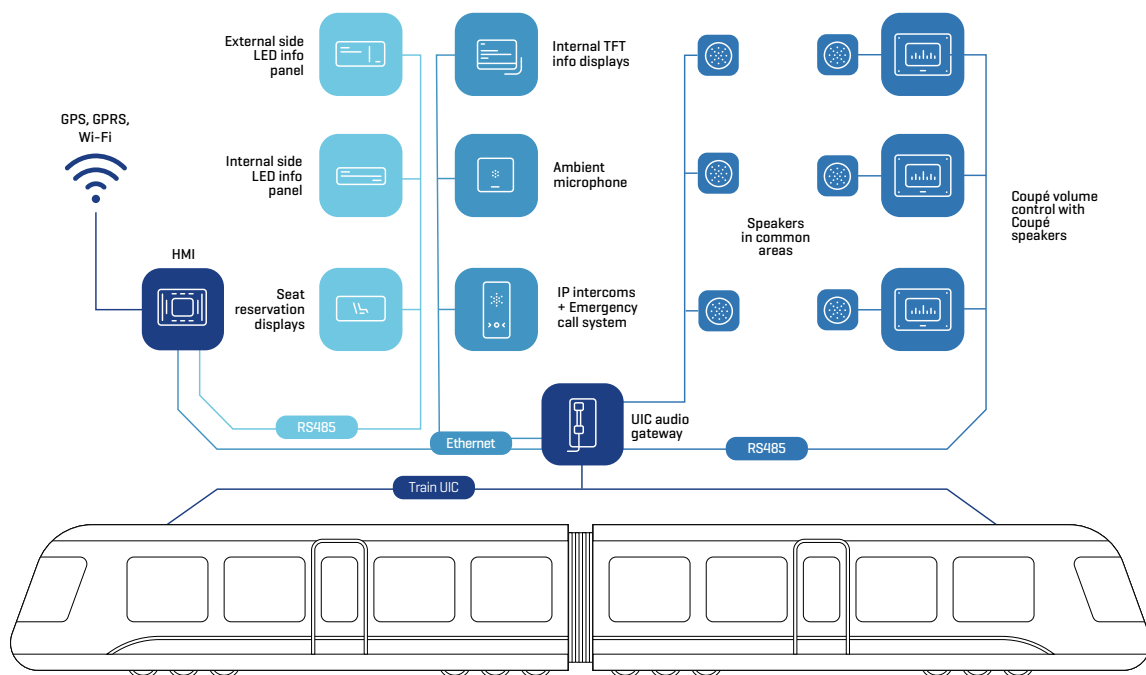
Communication and Diagnostic Units

UIC Audio Gateways

TCN Gateways

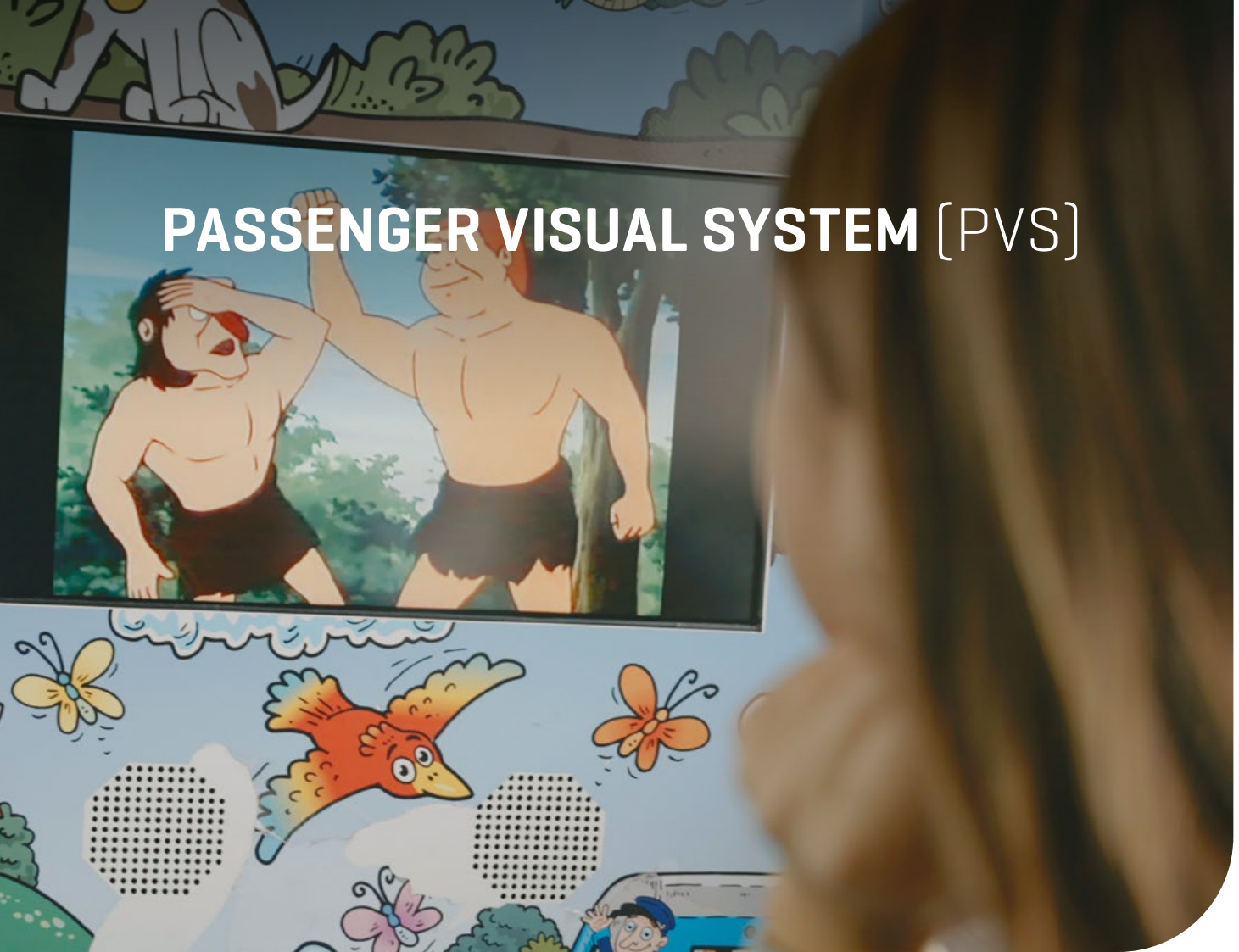
The AMiT passenger information system is designed as a modular system whose final appearance can be customized by adding and modifying individual components or sub-systems and by programming the functions specified in the project. The core of PIS includes the IP reservation system, the IP audio system, IP surveillance system and the IP display system. All components use a single communication infrastructure [RS485, Ethernet] which provides maximum flexibility to the final solution.

The entire information system provides the following – information from the train seat reservation system, information displaying on the interior and exterior LED and TFT display units, the diagnostics displaying of other technical equipment, passenger announcements and audio communication of operational staff. PIS further enables connection to the WTB train communication bus and/or Ethernet train backbone, GSM and Wi-Fi data transmission, and GPS positioning. The AMiT PIS passenger information system meets all the requirements of current European directives and both UIC 176 and UIC 556 standards.



SOLUTIONS FOR: TRAMS / METRO / HIGH SPEED AND COMMUTER TRAINS / LOCOMOTIVES / CARRIAGES [RIC]

PASSENGER VISUAL SYSTEM [PVS]



IP display units are deployed as informational panels and displays into passenger information systems, as well as reservation systems and IP surveillance (CCTV) in public passenger transport. Rugged LED and TFT panels and displays are available in indoor and outdoor versions and are designed for very reliable operation in railway and rolling stock. They are suitable also for retrofitting of existing fleet.

Components of Display System

LED Panels

TFT Displays

Route Map Displays



Reliability, excellent visibility and total cost of ownership efficiency are key benefits of the IP display units. All display units are thoroughly tested in our test centre and validated in demanding operations of public environments.

SEAT RESERVATION SYSTEM [SRS]



A Seat Reservation System can be a part of a Passenger Information System of compartment or open passenger carriages. There are two types of reservation displays. Seat Reservation Displays can be controlled via control computer inside information system. The reservation displays are designed mechanically so that they can be mounted for example into luggage shelves above seats.



Components of Seat
Reservation System

TFT Displays
OLED Displays



SURVEILLANCE SYSTEM [CCTV]



- Provides more security and prevents vandalism
- Uses video data from IP cameras located inside and outside vehicles
- Option of storing data to help to prove the crime or the cause of accidents
- Recorded data can be analyzed using the Acasys Studio program
- Modular system designed according to project requirements
- Customisation to meet specific standards and rules

The ACASYS surveillance system provides more security and prevents vandalism and other crimes in vehicles by monitoring video data from IP cameras located inside and outside vehicles.

Components of CCTV

IP Cameras

Recording Units

Ethernet Switches

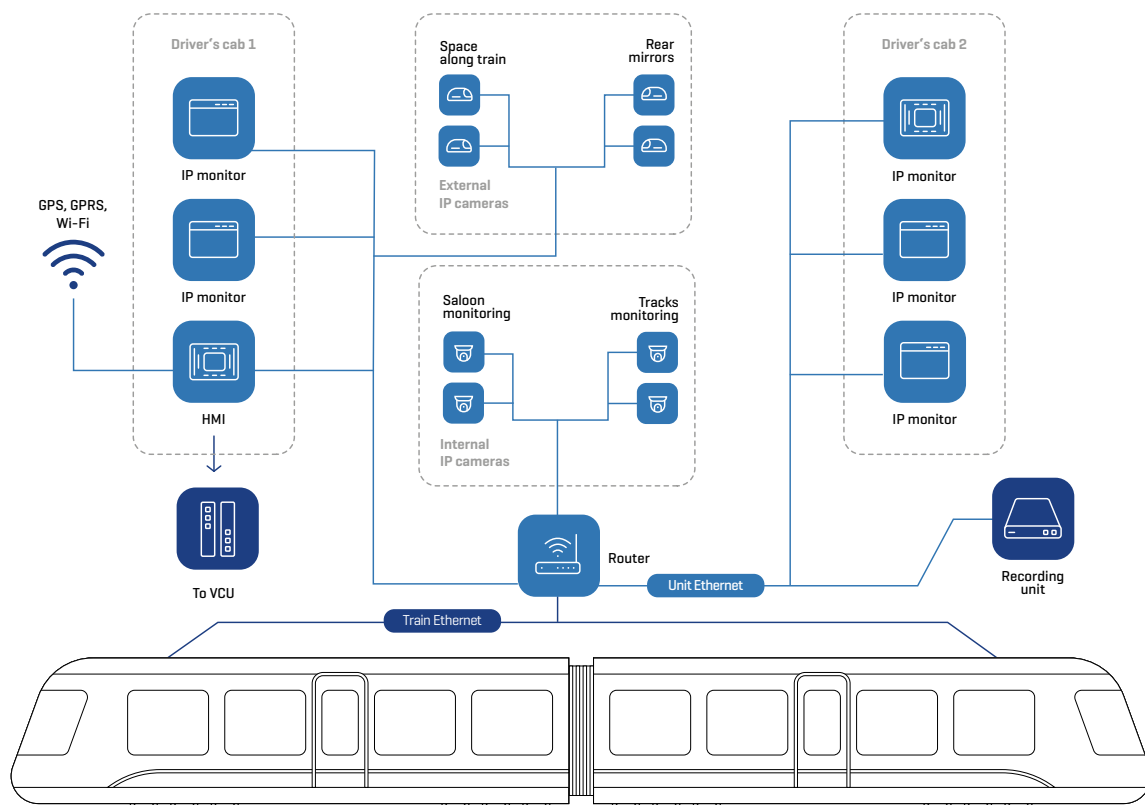
Camera Covers

TFT Monitors

ACASYS Viewer NG

The IP surveillance system uses the same Ethernet communication infrastructure as other systems in the vehicle and can be easily integrated into the higher-

level control. The functions of the recording unit and the method of data transfer can be adapted to the specific requirements of a project.



AUDIO SYSTEM (PA / EI)



- Digital audio system for rolling stock
- Provides all essential requirements for vehicle audio communication:
 - automatic acoustic announcements to passengers
 - driver's communication to passengers
 - intercom between driver and conductor
 - passenger emergency communication with conductor and driver
- Modular system design according to project requirements
- Meets all requirements of standards and directives

The AMiT audio system is a digital audio system for rolling stock that provides all the essential requirements of vehicle audio communication as automatic acoustic announcements to passengers from a central information system. Our system includes both options: Public Address and Emergency Intercom functionality.

Components of Audio System

IP Amplifiers

UIC Audio Gateways

IP Intercoms

SIP Gateway

Digitizers

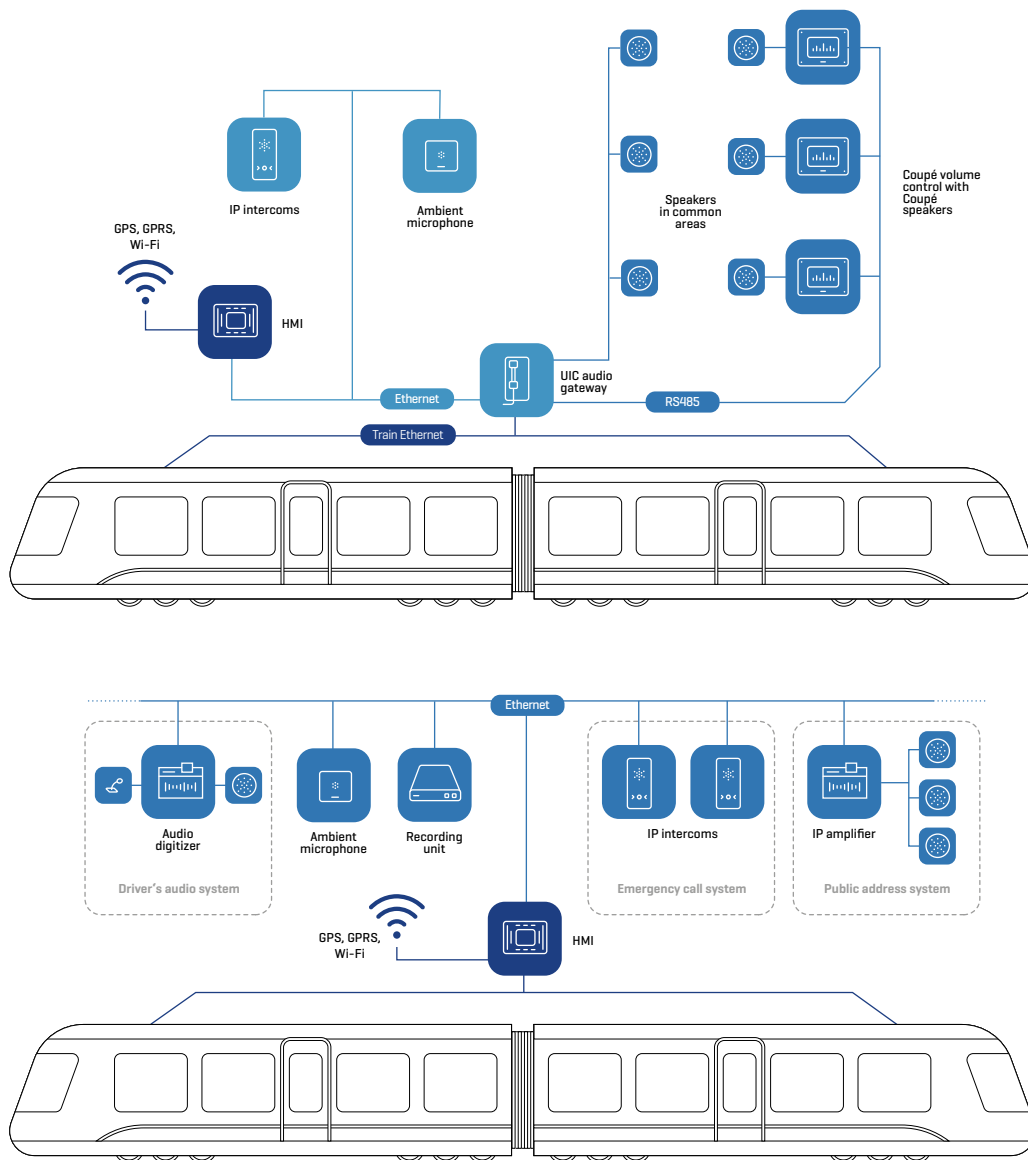
Microphone units

IP Microtelephone

Other audio components

These include the driver's communication to passengers, an intercom between the driver and the conductor and passenger emergency communication with the conductor

and the driver. The IP audio system is a modular system whose final appearance depends on the specific project requirements.



PASSENGER Wi-Fi ON-BOARD SYSTEM [PWLAN]



- Internet access for passengers in carriages
- Supports QoS operation, as well as routing and firewall rules
- Swift and smart GPS GeoFencing
- Aggregation of wireless connections
- Separation of passenger and operator Wi-Fi networks [VLAN]
- Flexible solution for both new and current vehicles
- Robust redundant concepts
- EN 50155 compliant

Flexible Wi-Fi solutions, i.e. all the devices involved in providing it, use the fast Ethernet network of a vehicle. They can be used to equip both new vehicles [including double-decker rolling stock] and older ones, which are equipped with an Ethernet network or any necessary cabling.

Components of the on-board Wi-Fi solution

4G / 5G Routers

GSM and GPS Antennas

Wi-Fi Access Points

Wi-Fi Antennas

The configuration of each system varies depending on the length of vehicles and the interior layout, number of passengers and even the number of users who are expected to use the Wi-Fi connection.

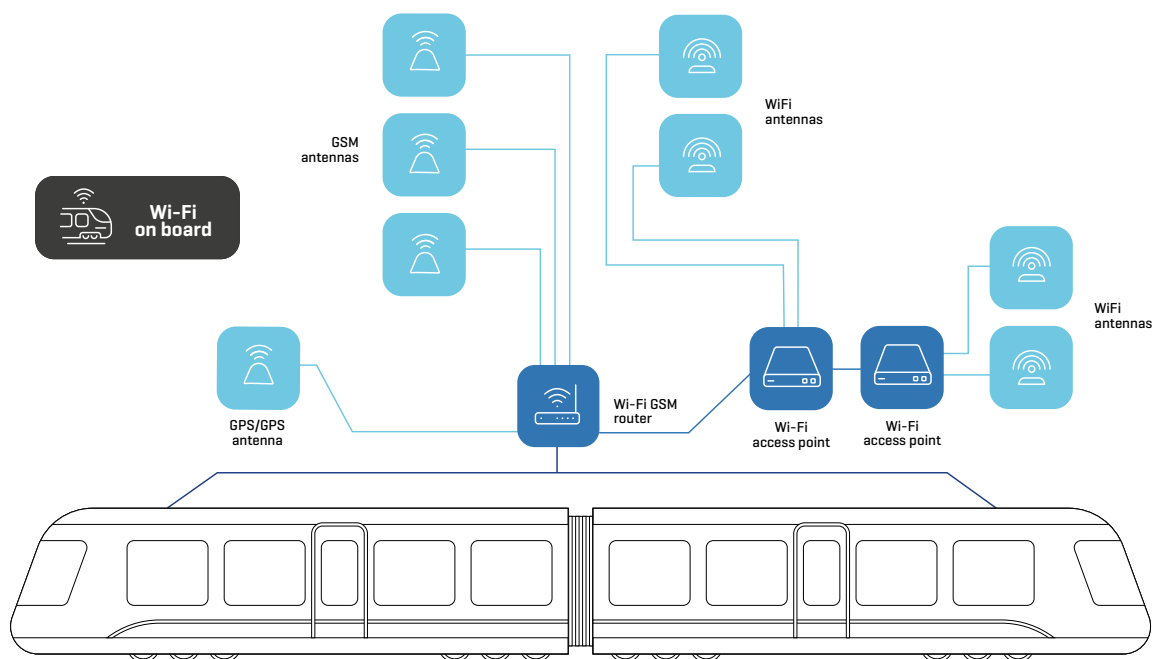
A key part of the solution is the 4G / 5G router with its integrated switch and module determining GPS / Glonass positioning. The router serves as a receiver of signals from the transmitters of mobile operators and positioning satellites and can also separate Wi-Fi networks for passengers from the vehicle operator's network [VLAN]. In its basic configuration, one 4G / 5G router includes up to four modems, each of which allows the use of up to four SIM cards individually.

The signal from various transmitters, i.e. from different operators can be received due to the large number of SIM

cards, which improves the quality of connecting vehicles to GSM networks. This is primarily used for the smart switching between operators, e.g. when crossing national borders.

The 4G / 5G router can be acquired as a simple dedicated device.

The Wi-Fi access points [Wi-Fi AP] ensure fast internet access for passengers and secure wireless access for personnel operating the vehicle. Their switching Ethernet interfaces allow other systems to be connected, e.g. the Passenger Information System, infotainment, the IP audio system and the IP surveillance system.



HMI PANEL COMPUTERS



- Versions with TFT 7" , 10,4" , 12,1" , 15,6" and resistive / capacitive touch screen
- Up to 32 customizable keys with backlight
- Intel or ARM version
- No moving parts (fan or HDD)
- Operation system Linux or Windows
- Waterproof variant
- Wide operating temperature range -40 °C to 70 °C
- Wide range of power supply voltages

Rugged and temperature-durable on-board computers for rolling stock applications. Used as HMI units for driver's desk, control of passenger information system, surveillance system control/display unit or diagnostics and communication units.



	AW3xxx	APTxAxxx	AIPQM1070
Processor	Intel ATOM x6414RE Quad Core, 4× 1.5GHz, 4GB RAM, 32GB eMMC FLASH	ARM Cortex A-53, Quad Core, 4× 1.6 GHz, 2 GB LPDDR4, 4 GB eMMC	ARM A8, 800MHz, 256MB RAM, 1GB NoFlash
FLASH	None / CFast slot / mSATA		None / CFast slot / mSATA
Operation system	None / Linux / Windows		None / Linux / Windows
Display	TFT LCD 10,4", 12,1", 15,6"		TFT LCD 7"
Keyboard	None / 32 keys, backlight, UIC612-01 / 26 keys, backlight, Customized print		None
Touch screen	None / Resistive / PCT		PCT
USB	2 × USB 2.0 type A / 1 × USB 2.0 M12, 5-pin, A-code		2 × USB A M12, 5-pin, A-code
Audio	None / Stereo input / Stereo output		None
Ethernet interface	1 / 2 × Ethernet 10 / 100 Mbps [M12, D-coded]		1 × Ethernet 10 / 100 Mbps [M12]
RS232	None / 1 ×		None
RS485 / RS422	None / 1 × / 2 ×		None
CAN	None / 1 × / 2 ×		None
MVB	None / 1 ×		None
Wireless	Wi-Fi - None / 1 × 802.11a/b/g/n/ac [2,4, 5 GHz] GPS - None / 1 × GPS GLONASS GSM - None / 1 × 2G / 3G / 4G [LTE]		None
Power supply	24 V / 36 V / 72V / 110 V [-30 % to +25 %]		24 V [-30 % to +25 %]
Protection front panel	IP65		IP65
Protection back panel	IP20 / IP54		IP20 / IP50
Operating temperature range	-30 °C to 70 °C / -40 °C to 70 °C		-30 °C to 70 °C
Mounting	AMiT / UIC612-01 / Customized		AMiT
Weight	Typ. 3,60 kg		Typ. 1,20 kg
Standards	EN 50155, EN 50121-3-2, EN 45545-2		

VEHICLE COMPUTERS



- No moving parts (fan or HDD)
- Operation system Linux or Windows
- Intel and ARM version
- Waterproof variant
- Wide operating temperature range -40 °C to 70 °C
- Wide range of power supply voltages
- 24 V / 36 V / 72V / 110 V [-30 % to +25 %]

Rugged and temperature-durable on-board computers for rolling stock applications. Used for driver's desk, control of passenger information system, surveillance system control/display unit or diagnostics and communication units.



	PWxxx	PPXI7xxx
Processor	Intel ATOM x6414RE Quad Core, 4× 1.5GHz, 4GB RAM, 32GB ARM Cortex A-53, Quad Core, 4× 1.6 GHz, 2 GB LPDDR4, 4 GB	Intel Core i7-8850H, 6 cores, 2.6 GHz eMMC FLASH
FLASH	None / CFast slot / mSATA	None / SD slot / mSATA / 2.5" SSD
Operation system	None / Linux / Windows	
USB	2 × USB 2.0 type A, 1 × USB 2.0 M12, 5-pin, A-code	1 × USB 3.0 type A, 1 × USB 2.0 M12, 5-pin, A-code
Audio	None / Stereo input / Stereo output	-
Ethernet interface	1 / 2 × Ethernet 10 / 100 Mbps [M12, D-coded]	2 × 1 Gbps, connector M12 8-pin X-coded, socket
RS232	None / 1 ×	
RS485	None / 1 × / 2 × / 1 × RS422	-
CAN	None / 1 × / 2 ×	-
MVB	None / 1 ×	-
Wireless	Wi-Fi - None / 1 × 802.11a/b/g/n/ac [2,4, 5 GHz] GPS - None / 1 × GPS GLONASS GSM - None / 1 × 2G / 3G / 4G [LTE]	-
Power supply	24 V / 36 V / 72V / 110 V [-30 % to +25 %]	16.8 V to 50.4 V DC
Protection	IP65 / IP20	
Operating temperature range	-40 °C to 70 °C	
Mounting	On the base plate	
Weight	Typ. 4.00 kg	Typ. 9.7 kg
Standards	EN 50155, EN 50121-3-2, EN 45545-2	

Applicable alternatives

Recording units PPSxxx



Ethernet router RB-RTExxx



RECORDING UNITS



- OS Linux platform
- Secure storage of data which does not allow changes
- SSD recording media
- Native Ethernet wire transfer

- ONVIF compliant
- Easy integration into LAN / WAN
- Accessible administration functions from remote terminal or through LAN
- SOS mode – on-line data transmission to the control centre
- Web server for on-line data monitoring
- Supercap power backup for safe power-down
- EN 50155 compliant

Main applications: video-recording from CCTV systems, audio-data recording, metadata storage for passenger information systems, diagnostics data recording. Other functions on demand: disk mirroring [RAID], remote configuration of devices, wireless transmission.



	PPSxxx	PPSXDxxx
CPU	Intel ATOM x6414RE Quad Core, 4× 1.5GHz, 4GB RAM, 32GB eMMC FLASH	ARM Cortex A-53, Quad Core, 4× 1.6 GHz, 2 GB LPDDR4, 4 GB eMMC
OS	Linux	
Disks - separately supplied		
- SSD - industrial design	256 GB / 512 GB / 1 TB / 2 TB	
- SSD - commercial design	256 GB / 512 GB / 1 TB / 2 TB	
Ethernet with connector type	M12 100 Mbps / M12 1 Gbps	
USB	2 x USB 2.0, A type	
Power supply	24 V / 36 V / 110 V DC [-30 % to +25 %]	
Operating temperature range		
with SSD – industrial design	-40 °C to 70 °C	
Cover protection rate	IP20	
Standards	EN 50155, EN 50121-3-2, EN 45545-2	

The PPSxxx product line of recording units are industrial computer-based devices using the Linux operating system. The units are intended for the reliable and steady recording of voice, video, diagnostics and metadata into recording disks. Recorded data can be transmitted by directly connecting an Ethernet cable to the recording unit and by retrieving data remotely or directly from storage disks using reading units.

Data recording is carried out in a circular buffer, i.e. after the disk capacity is full the old data is automatically

overwritten with new data. The device allows a time limitation of record keeping to be set up. This functionality has been prepared to meet individual national legislative requirements on the time storing of sensitive data.

The unit supports the recording of audio and video formats transmitted through the RTP protocol. Acasys Viewer NG software is supplied together with a recording unit, which stores data from the surveillance system to manage and analyse the video data.

AUDIO DEVICES

Digital audio system for railway and rolling stock. Modular system – the system design according to project requirements. Modern European standard technologies.



- IP audio equipment for vehicle communication system
- Communication through Ethernet lines with M12
- Wide range of operating temperatures -40 °C to 70 °C
- EN 50155 compliant



UIC Audio Gateways	RRAM-MCT/E30-Ax
Buttons	8 × buttons under foil with LED indication
External audio input	1 x audio signal
Power audio output	2x
Audio interface standard	UIC558, UIC568
Ethernet interface	1 x Ethernet, 100 Mbps, M12
Power supply	16.8 V DC to 33.6 V DC



IP Telephones	RRAM-MCT/Ax
Buttons	2× anti-vandal type, 12 mm
External audio input	1 x audio signal
Power audio output	1 × audio signal for loudspeaker
Audio interface standard	IP40 [front panel] / IP20 [rear panel]
Ethernet interface	1 x Ethernet, 100 Mbps, M12
Power supply	24 V DC [-30 % to +25 %]



IP Intercom	RRAM-ICTNxx
Loudspeaker	Electrodynamic, 2 W, 250 Hz to 10 kHz
Microphone	Electret, 30 Hz to 16 kHz
Button	1 × anti-vandal type with green LED back-lit
Visual signalling	4x Led with pictograms
Ethernet interface	1 x Ethernet, 100 Mbps, M12, D - Code
Power supply	16.8 V DC to 33.6 V DC / PoE
Cover protection rate	IP40 / IP20



Microphone for drivers	RRAS-GNMxxx
Frequency range	100 Hz to 16 kHz
Backlight	contour LED
Buttons	2x
Protection rate	IP40 [front panel] / IP20 [rear panel]
Gooseneck length	460 mm
Operating temperature	-40 °C to 70 °C



IP Audio Amplifier	RRAM-PWAxx
Permanent sinus power	2 × 30 W
Peak music power	2 × 48 W
Min. load impedance	4 Ω / channel
Interfaces	Ethernet 10 / 100 Mbps, M12
Power supply	16.8 V DC to 33.6 V DC
Cover protection rate	IP20



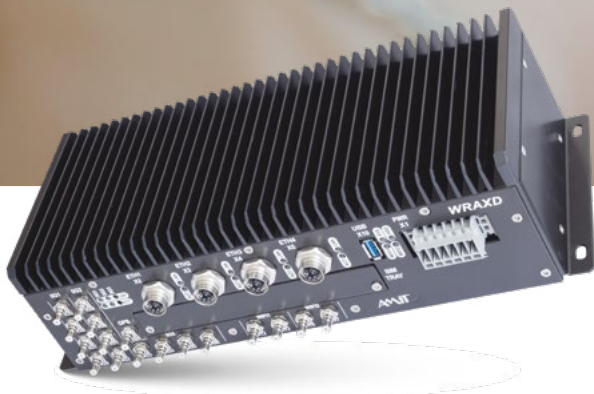
IP Audio Digitizer	RRAM-MCTNxx
Audio inputs	1× microphone, 1× link
Connector	microphone input: D-Sub DE-9, link input: BNC
Digital inputs	2× contact
Interfaces	Ethernet 10 / 100 Mbps, M12
Power supply	16.8 V DC to 33.6 V DC / PoE according
Cover protection rate	IP20
Operating temperature	-40 °C to 70 °C



SIP Audio Gateway	RRU-CU/BA
GPS	1 ×
GSM / LTE	1 × EGSM class 10 / UMTS / HSPA+ / LTE
Wi-Fi	1 × 802.11a/b/g/n, 2,4 GHz
Interfaces	Ethernet 10 / 100 Mbps, M12
Power supply	16.8 V DC to 33.6 V DC / PoE according
Cover protection rate	IP20
Operating temperature	-40 °C to 70 °C

Wi-Fi DEVICES

The AMiT internet solution for railway and rolling stock is built on infrastructure assembled of GSM routers [WR product line], Wi-Fi access points [WAP product line] and supplementary components like antennas and cabling.



- **Triple play solution**

- Passengers
- Crew [Staff]
- Train [Fleet]

- **GSM communication 4G (LTE) / 5G**

- **GSM-R**

- **MIMO / Diversity**

- **On-board communication 802.11a/b/g/n/ac/ax [2.4 or 5 GHz]**

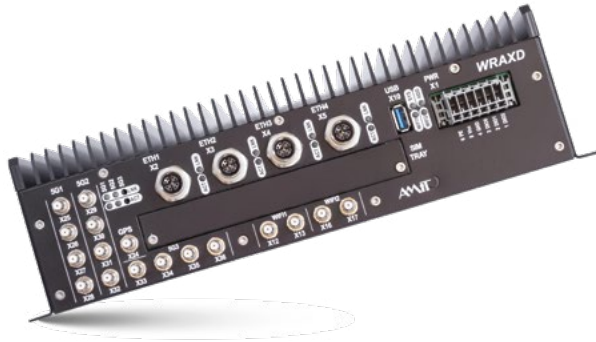
- **2x2 MIMO / 3x3 MIMO / 4x4 MIMO**

- **Optional features include:**

- Password protection, Data encoding protection
- URL blacklist, Manageable Connection Policy, and more ...

- **Unattended switching connection when crossing national borders via GPS**

- **EN 50155 compliant**



Wi-Fi Routers	WRAxxx	WRAXDxxx
CPU	Intel ATOM x6414RE Quad Core, 4× 1.5GHz, 4GB RAM, 32GB eMMC FLASH	ARM Cortex A-53, Quad Core, 4× 1.6 GHz, 2 GB LPDDR4, 4 GB eMMC
SSD	none / 4 - 512 GB	
LTE modem / Mini PCI Express slot	2 - 4 ×	1 - 4 ×
Communication standards	EGSM class 10 / UMTS / HSPA+ / LTE / 5G	
RF	MIMO / Diversity	
SIM card slots	1 - 4 per modem	
Connection point	QMA	
GPS / Glonass	1 ×	
Connection point	QMA	
Wi-Fi	2 ×	
Communication standards	802.11a/b/g/n/ac/ax [2.4 GHz or 5 GHz]	
RF	2 x 2 MIMO / 3 x 3 MIMO / 4 x 4 MIMO	
Connection point	QMA	
Ethernet	4 ×	
Data transmission rate	1 Gbps / 100 Mbps / 10 Mbps	
Connection point	8-pin connector M12, X-coded	
I/O	3 × digital input / output	
Power supply	24 V / 36 V / 110 V	
Cover protection rate	IP20	
Operating temperature range	-40 °C to 70 °C	
Weight	2.48 kg	



Wi-Fi Access Point	WAPXxx
CPU	ARM Cortex A-53, Quad Core, 4× 1.6 GHz
Wi-Fi	2 ×
Communication standards	802.11a/b/g/n/ac/ax [2.4 GHz or 5 GHz]
Connection point	2 x 2 MIMO / 3 x 3 MIMO / 4 x 4 MIMO
RF	QMA
Ethernet	1 - 2 ×
Data transmission rate	1 Gbps / 100 Mbps / 10 Mbps
Connection point	8-pin connector M12, X-coded
I/O	2 × digital input/output, 24 V DC
Power supply	24 V / 36 V / 110 V
Operating temperature	-40 °C to 70 °C
Cover protection rate	IP20
Weight	1.50 kg



Communication and diagnostic units	RRU-CU/AA
CPU	ARM A8, 800MHz, 256MB RAM, 1GB NoFlash
GPS	1 × SMA connector
GSM / LTE	1 × EGSM class 10 / UMTS / HSPA+ / LTE / GSM-R
Wi-Fi	1 × 802.11a/b/g/n, 2.4 GHz
Ethernet	1 × 10 / 100 Mbps M12
Dimensions [w × h × d]	[106 × 128 × 205] mm
Power supply	16.8 V to 33.6 V DC
Operating temperature	-40 °C to 70 °C
Cover protection rate	IP20
Weight	1.16 kg

TFT INFORMATION PANELS



- Variable mechanical versions (on wall, front panel, VESA 100 mounting, on glass, on console)
- single monitor / double display monitor

- 10 / 100 Mbps Ethernet
- Project-based of customization of software
- Wide operating temperature range -30 °C to 70 °C
- UIC 176 version available
- TSI PRM compliant
- Application software for surveillance systems or PIS
- EN 50155 compliant

Displays designed for surveillance system [CCTV], rear-view mirror or passenger information system [PIS].
Rugged and temperature-durable TFT panels for rolling stock applications.
Customization based on specific project requirement.



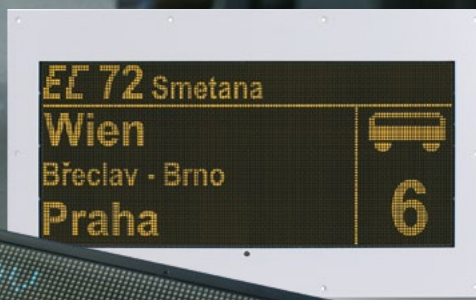
TFT panels common parameters

Display	TFT LED LCD
Back-lit	LED
Ethernet interface	1 × [10 / 100 Mbps], M12, D-coded
Power supply	24 V DC
Galvanic isolation	Yes
Operating temperature range	-30 °C to 70 °C
Mounting	open frame / on the ceiling / on the wall
Application software	Project customized
Operation system	Linux
Standards	EN 50155, EN 50121-3-2, EN 45545-2

TFT INFORMATION PANEL TYPES [ETHERNET, M12 D-CODE]

Type	Size	Displays	Resolution	Mounting	Dimensions [mm]	Protection rate	UIC 176
AIPQxx215Wxxx	21,5"	1 x	1920x1080	open frame on the ceiling on the wall	[554 × 360 × 251]	IP00 IP20 IP50	2.4
AIPDxx215Wxxx	21,5"	2 x	1920x1080		[554 × 360 × 326]		2.4
AIPQxx185Wxxx	18,5"	1 x	1366x768		[518 × 314 × 151]		2.4
AIPDxx185Wxxx	18,5"	2 x	1366x768		[554 × 360 × 251]		2.4
AIPB1A0L103K0NA	10,4"	1 x	1024x768	in the panel	[345 × 217 × 116]	IP65 / IP20	2.4

LED INFORMATION PANELS



- Variable mechanical versions
- Light sensor / Automatic brightness control
- RS485 interface
- Ethernet interface
- Integrated WC symbol as option
- Wide operating temperature range -40 °C to 70 °C
- UIC 176 versions available

- TSI PRM compliant
- EN 50155 compliant

Dot matrix information panels are designed for passenger information systems. There are exterior and interior panel versions available. The LED panels are ideal for rolling stock applications due to the extremely wide range of operating temperatures and their robust and durable design.



LED panels common parameters

Display	LED
LED colour	Yellow - 590 nm typ., Red - 633 nm typ., White (different color options on demand), RGB
Resolution	Optional
Pitch [mm]	4 / 5 / 6 / 8
Front panel protection	Open frame / IP30 / IP65
Brightness	Internal - typ. 200 cd/m ² , External - typ. 800 cd/m ²
Light sensor	Automatic brightness control
Interface	RS485 / Ethernet
Galvanic isolation	Yes
Power supply	24 V DC / 110 V DC
Cover color	Typically RAL7035, RAL9005 (different color options on demand)
Operating temperature range	-40 °C to 70 °C
Standards	EN 50155, EN 50121-3-2, EN 45545-2



RGB LED - ROUTE MAP DISPLAYS

Type	Resolution	Pitch [mm]	Colour	Brightness [cd/m ²]	Dimensions [mm]	Front panel protection	UIC 176
Interface: Ethernet							
DLM100/A	1 x 40	1 x	RGB	800	[720 x 98 x 27]	IP00	-
AIPB1A0L103KONA	EN 50155, EN 50121-3-2, EN 45545-2						

SEAT RESERVATION DISPLAYS



OLED displays are used as reservation system terminals for open passenger carriages in railway rolling stock. The customer can adjust and finish the vehicle reservation system themselves as needed in the specific project.

- CANopen / RS485
- Wide operating temperature range -40 °C to 70 °C
- EN 50155 compliant



LCD Displays	AMT3010/A1
Display	OLED
Backlight, colour	YELLOW
Size	128 × 64 pixels
Communication	1 × RS485
Power supply	16.8 V DC to 50.4 V DC
Operating temperature	-40 °C to 70 °C
Mounting	To the shelf frame, 2× M4 screw
Standards	EN 50155, EN 50121-3-2, EN 45545-2

CAMERA COVERS



Exterior camera covers [housings] are designed for mounting on a vehicle body. The covers are available in left- and right-side versions, depending on where they are to be installed on the vehicle body. Their color can be customized based on the customer's specifications. The covers are designed for the exact types of IP cameras listed below.

- Part of IP surveillance system [CCTV] for rolling stock
- Variants with internal heating glass or without heating
- Variants with chemical tempered glass and sapphire glass
- Autonomous heating control independent of the camera
- Goretex grommets
- EN 50155 compliant



Camera Covers	KKR-AL01H/xxx	KKR-AL01/xxx
Recommended camera	AXIS AP3905-RxxA [B] MK II, MOXA VPORT P06	
Heating variants	heated glass / tempered glass / sapphire glass	none
Heater power supply	24 V DC [-30 % to +25 %]	none
Heating power	7.8 W for temperatures below -5 °C	none
Current consumption	0,65 A at 24 V DC	-
Cover protection rate	IP65	
Colour	black / other colour on demand	
Operating temperature	-40°C to 70°C	
Mounting	on the vehicle body	
Standards	EN 50155, EN 50121-3-2, EN 45545-2	

TCMS SYSTEM COMPONENTS

SUBRACK TRAIN CONTROL & MANAGEMENT SYSTEM

VEHICLE CONTROL UNITS (VCU)

REMOTE I/O UNITS

POWER SUPPLY UNITS

SUBRACK



- CANopen DS 401 communication protocol
- MVB interface EMD, ESD (double line attachment)
- 10 / 100 Mbps Ethernet (M12 connector attachment)
- WTB interface (UIC 556 certified)
- Standby redundancy within subrack (CPU, power, gateway unit, I/O units)
- Wide operating temperature range -40 °C to 70 °C
- Wide range of power supply voltages 24 V DC to 110 V DC
- EN 50155 compliant

Subrack vehicle control unit with communication and I/O card mainly for TCMS applications.

Rugged and temperature-durable control system for rolling stock applications.

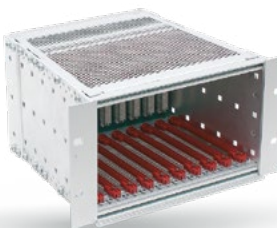
POWER SUPPLY UNITS

Type	RV-PW04/100x
Max power	40W
Power supply	24 V / 48 V / 72 V / 110 V DC



VEHICLE CONTROL UNITS

Type	RV-CPMC/1x01
MVB Class	class 1: DS + PD class 2: DS + PD + MD class 3: DS + PD + BA class 4: DS + PD + MD + BA
CAN	1 - 6
CANopen	Master
Ethernet	10 / 100 Mbps [M12]



SUBRACK 19" SYSTEM CENTRAL CONTROL UNIT

Type	RV-CPTRDP/1100
Protocol	TRDP TCNOpen 1.3.3.0
Ethernet	Ethernet connector M12
Interfaces	CAN interface, connector concatenation Internal communication interface RAVA
Power supply	24 V DC
Operating temperature range	-40 °C to 70 °C
Dimension	8HP x 3V
Mounting	19" subrack RV-RC0xx
Standards	EN 50155, EN 50121-3-2, EN 45545-2 EN 60068-2-1, EN 60068-2-2

SUBRACK UNITS

Type	RV-RC010	RV-RC015	RV-RC021
Number of slots	10	15	21

Units specific parameters				
Type	DI	DO	AI	AO
RV-I/0111	32 [24 V]			
RV-O/0211		24 [24 V / 4 A, HSS]		
RV-F/0211		24 [24 V / 4 A, HSS]		
RV-A/1110			12 [0 mA to 30 mA]	
Standards	EN 50155, EN 50121-3-2, EN 45545-2			

TCMS SYSTEM COMPONENTS

DISTRIBUTED TRAIN CONTROL & MANAGEMENT SYSTEM

VEHICLE CONTROL UNITS (VCU)
REMOTE I/O UNITS



- Distributed train control system
- CANopen DS 401 communication protocol
- TRDP communication protocol
- Concatenated CAN
- Geographical configuration of the node
- Operational software with redundancy
- CAN communication
- Powerful development tool TrolStudio
- Wide operating temperature range -40 °C to 70 °C
- 24 V DC or 48 V DC power supply
- EN 50155 compliant

Vehicle control units with distributed I/O for control of vital or non-vital parts of rolling stock (TCMS, CCTV, PIS applications).
Rugged and temperature-durable control system for rolling stock applications.

VEHICLE CONTROL UNITS

	RRCPU-xxx	RRC2-CPxxx
CPU	STM 32F427	STM 32F437
Processing FLASH memory	2 MB	
Archive FLASH memory	128 MB	
RTC	Yes	
Back-up battery	RAM + RTC	
Inputs	8 × DI 24 V DC + 1 × AI [4 mA to 20 mA]	3 × DI 24 V DC + 1 × AI [4 mA to 20 mA]
Outputs	3 × DO 24 V DC / 4 A [MOS]	1 × RDO 24 V DC / 4 A, Switching contact
CAN	4 × / 8 ×	8 ×
Ethernet	10 / 100 Mbps [RJ45]	10 / 100 Mbps [M12]
Power supply	24 V DC	
Cover protection rate	IP30	
Operating temperature range	-40 °C to 70 °C	
Mounting	35 mm DIN rail	
Weight	1.40 kg	1.62 kg
Standards	EN 50155, EN 50121-3-2, EN 45545-2	

REMOTE I/O UNITS

	RRC2-xx	RRT2-xx
CAN interface	1 ×	-
Communication rate	250 / 500 / 1000 kbit	-
Ethernet	-	Ethernet connector M12
Communication protocol	CANopen DS 401	TRDP TCNOpen 1.3.3.0
Power supply	24 V DC / 48 V DC	
Cover protection rate	IP30	
Operating temperature range	-40 °C to +70 °C	
Mounting	35 mm DIN rail	
Weight	1.25 kg	
Dimensions [w × h × d]	[199 × 110 × 69] mm	
Standards	EN 50155, EN 50121-3-2, EN 45545-2	

Remote I/O Units specific parameters							
Type	DI	DO	RDO	AI	AO	Communication	Vcc
RRC-I/001	32	-	-	-	-	CANopen	24 V DC
RRC-I/005	32	-	-	-	-	CANopen	48 V DC
RRC-IO/001	16	8	-	-	-	CANopen	24 V DC
RRC-AIO/001	12	6	-	4	-	CANopen	24 V DC
RRC-AIO/201	12	6	-	4	-	CANopen	24 V DC
RRC-IOR/001	12	7	2	-	-	CANopen	24 V DC
RRC-O/001	-	16	-	-	-	CANopen	24 V DC
RRC-O/005	-	16	-	-	-	CANopen	48 V DC
RRC-ION/001	12	8	-	-	4	CANopen	24 V DC
RRC2-IO/001	16	8	-	-	-	CANopen	24 V DC
RRC2-AIO/001	16	8	-	4	-	CANopen	24 V DC
RRC2-I/001	32	-	-	-	-	CANopen	24 V DC
RRT2-IO/001	16	8	-	-	-	Ethernet / TRDP	24 V DC
RRT2-AIO/001	16	8	-	4	-	Ethernet / TRDP	24 V DC
RRT2-I/001	32	-	-	-	-	Ethernet / TRDP	24 V DC

TCMS SYSTEM COMPONENTS

DISTRIBUTED TRAIN CONTROL & MANAGEMENT SYSTEM

FUSE MODULES WITH CANOPEN



- 15 / 25 × fuse base with fuse status reading
- Supplementary universal inputs/outputs
- CANOpen DS 401 communication protocol
- Concatenated CAN
- Geographical configuration of the unit
- Wide operating temperature range -40 °C to 70 °C
- 24 V DC power supply
- EN 50155 compliant

RRFSxx units are designated to protect electrical circuits of rolling stock and provide actual fuse status information to the vehicle control system. The units meet the requirements of EN 50155 [electronic equipment of rolling stock] class TX and related standards.



FUSE MODULES - SPECIFIC PARAMETERS

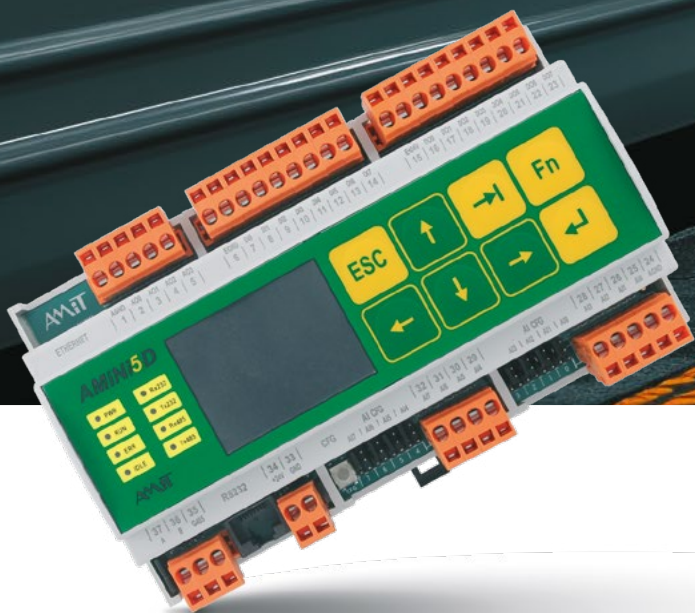
	RRFS15/001	RRFS25/001
Number of fuses	15	25
DI	10	10
DO	8	-
AI	1	-
Vcc	24 V DC	24 V DC

Common parameters	
Maximum current for one fuse	25 A DC
Max. total current for three fuses side by side	45 A DC
Fused voltage	24 V DC
Fuse type	Flat automotive fuses UNIVAL, automotive circuit breakers, size 1170
CAN interface	1 ×
Communication rate	250 kbit
Communication protocol	CANopen DS 401
Power supply	24 V DC
Protection rate	IP20
Operating temperature	-40 °C to 70 °C
Mounting	In-to the panel
Weight	2 kg
Dimensions [w × h × d]	[450 × 110 × 76] mm
Standards	EN 50155, EN 50121-3-2, EN 45545-2

TCMS SYSTEM COMPONENTS

DISTRIBUTED TRAIN CONTROL & MANAGEMENT SYSTEM

PLC UNITS FOR RAILWAY



- 8 DI, 8DO, 8 AI, 4AO
- Colour display 320 x 240 px
- Ethernet
- RS232 + RS485
- DetStudio / Gen 2 E+ programming and debugging
- Wide operating temperature range -40 °C to 70 °C
- EN 50155 compliant

An industrial computer equipped with the necessary hardware and software, designed to take over and perform control functions – process control, control of equipment on railways and rolling stock.

Compact control system with display	AMINI5D/Z1
CPU	STM32F437
FLASH memory	2 MB + 16 MB
RAM memory	1 MB + 16 MB
Slot for memory card	Micro SD
Display	TFT IPS (320 × 240) pixels
Digital inputs	8× DI with GI
Analogue inputs	8 AI without GI
Digital outputs	8× DO with GI
Analogue outputs	8 AO without GI
RS232	1 × without GI, connector RJ45
RS485	1 × with GI, connector WAGO231
Ethernet	10/100 Mbps, connector RJ45
Power supply	19.2 V DC to 28.8 V DC
Signal connection	WAGO 231 clamp connectors
Operating temperature	-20°C to +70°C
Mounting	DIN rail 35 mm
Weight	0.36 kg
Standards	EN 50155, EN 50121-3-2, EN 45545-2

Compact control system	ACOS200/Z1
CPU	STM32F427
FLASH memory	2 MB + 4 MB / 32 KB
RAM memory	1 MB
Slot for memory card	Micro SD
RAM + RTC backup	CR2477 lithium battery removable module
Digital inputs	32 × DI with GI
Analogue inputs	16 × AI without GI
Digital outputs	32 × DO with GI
Analogue outputs	8 × AO without GI
RS232	1 × connector D-Sub DE-9
RS485	1 × connector WAGO 231
Ethernet	10/100 Mbps, M12, D-coded
Power supply	14.4 V DC to 33.6 V DC
Signal connection	WAGO 231 clamp connectors
Operating temperature	-40 °C to 70 °C
Mounting	4 × ø 6 mm hole
Weight	2,04 kg
Standards	EN 50155, EN 50121-3-2, EN 45545-2

TCN UNITS

TRAIN COMMUNICATION NETWORK

WTB GATEWAYS



- Compact and modular version
- WTB gateway with up to 3 different communication lines
- WTB interface (with doubled line)
- 100 Mbps Ethernet (M12 connector attachment)
- MVB interface EMD / ESD (double line attachment)
- CAN interface (concatenated attachment)
- Standby redundancy within subrack (gateway unit, power)
- UIC 556 certified
- EN 50155 compliant

Gateway between vehicle and train bus, part of train communication network (TCN) . Ensure inter-operability between different cars [standardized according to IEC 61375-1, UIC 556].
Robust and temperature-durable gateways that fulfil demanding requirements for operating on rolling stock.



PRODUCT LINE

RRU-W.. [compact]	Ethernet	CAN	MVB	RV-W.. [modular]
RRU-WE/100x	•			RV-WE/1000
RRU-WEM/115x	•		•	RV-WEM/1150
RRU-WEC/110x	•	•		RV-WEC/1100

WTB gateway common parameters	
WTB interface	1 × (double line attachment)
Connection	4 × [D-sub DE-9]
Ethernet interface	1 × [10 / 100 Mbps]
Connection	M12, D-coded
MVB interface	1 × (double line attachment)
Interface type	EMD / ESD
Connection	2 × [D-sub DE-9]
MVB class	class 1, class 2
CAN interface	1 × / 2 ×
Communication rate	Up to 1 Mbit
Connection	2 × [D-sub DE-9, concatenation of units]
CANopen	Master
Protection rate	IP20
Operating temperature range	-40 °C to +70 °C
Power supply	24 V / 48 V / 72 V / 110 V DC
Development tools	WTB Bus Analyzer / MVB Bus Analyzer / TCN Protocol Stack
Standards	EN 50155, EN 50121-3-2, IEC 61375-2-1, IEC 61375-3-1, UIC 556

TCN UNITS

TRAIN COMMUNICATION NETWORK

WTB / MVB ANALYSERS



- WTB network compact analyser
- WTB interface with doubled line
- MVB network compact analyser
- MVB interface of EMD/ESD type with redundant lines
- Ethernet 100 Mbps
- Processing and analysis of data on PC
- Wide operating temperature range -40 °C to 70 °C
- Power supply voltage 24 V DC

Analysers of the WTB and MVB bus are passive bus elements monitoring the traffic on the bus and passing it to the Ethernet bus in UDP frames. A PC is attached to the Ethernet bus with a program for receiving and evaluating the UDP frames.

The analyser only monitors the bus - it is „invisible“ for other devices. All WTB or MVB frames on the bus are monitored. A timestamp is added to each frame and then passed to the Ethernet bus within the UDP frame. More MVB or WTB frames can be stored into a single UDP frame in order to optimize the utilization of the Ethernet bus.

The open source program Wireshark is used on the PC for which a plug-in is supplied. Wireshark is generally a widely-used software, that has become the standard for network protocols analysis. It is possible to use this

program with a supplied plug-in to view the individual frames of TCN communication and also to get some statistical information from the WTB or MVB layer, e.g. the minimum and maximum gap between master and slave frame. It is also possible to analyse protocols from higher layers [TCN PD and TCN MD protocol]. Moreover, when analysing the TCN MD protocol, it can view the whole TCN messages; when UIC E-Telegrams is being transmitted, its header and even the individual items for standard E-Telegrams is viewable. The user is allowed to modify or extend the supplied plug-in arbitrarily, e.g. to add an analysis of its own application protocol.

MVB ANALYSER

	RB-MVB/AN02
MVB interface	1 × (2 redundant lines), Class 0
Interface type	EMD + ESD
Connectors	2 × D-Sub DE-9 (concatenation)
Communication rate	1.5 Mbps ±0.01 %
Ethernet	1 ×
Communication rate	10 / 100 Mbps
Galvanic isolation	Yes
Connector	RJ45
Power supply	16,8 V to 33,6 V DC
Protection rate	IP20
Mounting	2 × ø 6 mm hole
Operating temperature	-40 °C to 70 °C
Weight	0,9 kg
Dimensions (w × h × d)	[33 × 228 × 87] mm
Standards	EN 50155, EN 50121-3-2, IEC 61375-2-1, IEC 61375-3-1, UIC 556

WTB ANALYSER

	RRU-WTB/AN01
WTB interface	1 × (redundant line)
Galvanic isolation	Yes
Connectors	4 × D-sub DE-9 connector according to IEC 61375- 1 ed.2
Communication rate	1 Mbps ±0.01 %
Ethernet	1 ×
Communication rate	100 Mbps
Galvanic isolation	Yes
Connector	RJ45
Power supply	16,8 V to 33,6 V DC
Protection rate	IP30
Mounting	Into 19" subrack
Operating temperature	-40 °C to 70 °C
Weight	1,55 kg
Dimensions (w × h × d)	[142 × 129 × 185] mm
Standards	EN 50155, EN 50121-3-2, IEC 61375-2-1, IEC 61375-3-1, UIC 556

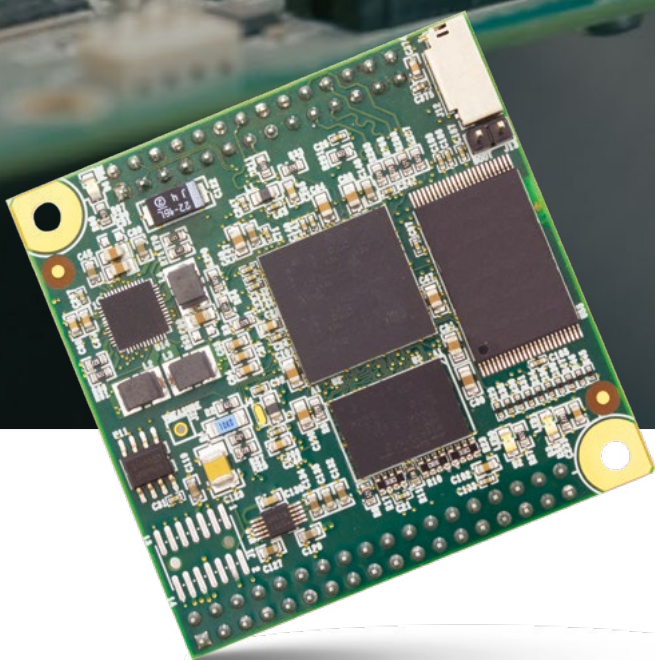
TCN UNITS

TRAIN COMMUNICATION NETWORK

MVB GATEWAYS

MVB MODULES

TRDP MODULES



- WTB network compact analyser
- WTB interface with doubled line
- MVB network compact analyser
- MVB interface of EMD/ESD type with redundant lines
- Ethernet 100 Mbps
- Processing and analysis of data on PC
- Wide operating temperature range -40 °C to 70 °C
- Power supply voltage 24 V DC

The MVB converters mediate conversion of various communication lines to an MVB line. The converters can be used to units connecting with Ethernet or CAN communication lines to the MVB line. The conversion processing of communication is provided in both directions.

MVB GATEWAYS

	RB-RTM/xBxxx [MVB / Ethernet]	RB-RTM/xAxxx [MVB / CAN]
MVB interface	1 × [redundant line]	
MVB class	Class 1 / Class 2 / Class 4 without MD / Class 4	
Interface type	EMD / ESD [depending to module outer wiring] / OGF	
Connectors	2 × D-Sub DE-9 [concatenation]	
Communication rate	1.5 Mbps ±0.01 %	
Interface	1 × Ethernet	1 × CAN
Communication rate	10 / 100 Mbps	Max. 1 Mbps
Galvanic isolation	Yes	Yes
Connector	M12, D-coded	2 × D-Sub DE-9 [concatenation]
Power supply	16,8 V to 33,6 V DC	
Protection rate	IP20	
Mounting	2 × ø 6 mm hole	
Operating temperature	-40 °C to 70 °C	
Weight	0,9 kg	0,9 kg
Dimensions [w × h × d]	[33 × 228 × 113] mm	[55 × 228 × 85] mm
Application software	Project customized	
Standards	EN 50155, EN 50121-3-2, EN 61373, EN 45545-2, IEC 61375-3-1	

MVB MODULE

MVB class	Class 1 / Class 2 / Class 4 without MD / Class 4
MVB interface	1 × [2 redundant lines]
Interface type	EMD / ESD [depending to module outer wiring] / OGF
Interface for host CPU	1 × [parallel / UART / LPC]
Communication rate	Depends on chosen interface type
Logical levels	3.3 V LVTTTL
Dimensions [w × h × d]	[50.0 × 48.0 × 12.0] mm
Standards	EN 50155, EN 50121-3-2, EN 61373, EN 60068-2-1, EN 60068-2-2, IEC 61375-3-1

MODULE WITH TRDP PROTOCOL

Protocol	TRDP TCNOpen 1.3.3.0
Interfaces	2 × interface Ethernet, external PHY, RMII
Host interface	UART / CAN / SPI / Eth
Power supply	5.0 V DC
Dimension	[55 × 55 × 19] mm
Operating temperature range	-40 °C to 70 °C
Mounting	2 × ø 3.2 mm hole
Standards	EN 50155, EN 50121-3-2, EN 61373, EN 60068-2-1, EN 60068-2-2

ETHERNET UNITS

MANAGED SWITCHES



- 6 and 12 ports Ethernet switches
- 10 / 100 Mbps / 1 Gbps
- Robust vibration-proof
- PoE version available
- Connections with M12 or RJ45
- Wide operating temperature range -40 °C to 70 °C
- EN 50155 compliant

Ethernet network has been successfully used and proven as inexpensive and reliable means of real-time on-board rolling stock communication. Ethernet elements of train networks meet the demanding requirements for resistance to extreme temperatures, vibration and against electromagnetic interference.

ETHERNET SWITCHES WITH M12

	RB-SW006/CM1	RB-SW00B/CM1	RB-SW024/CM1	RB-SW060/CM1
Number of ports	6	12	2 + 4	6
Ports with PoE	-			
10 / 100 / 1000 Mbps	-		2	6
10 / 100 Mbps	6	12	4	-
Connectors	6 x M12, D-coded	12 x M12, D-coded	2 x M12, X-coded 4 x M12, D-coded	6 x M12, X-coded
Power supply	16,8 V to 33,6 V DC			
Power consumption	Max. 0,3 A at 24 V DC	Max. 0,5 A at 24 V DC	Max. 0,3 A at 24 V DC	
Cover protection rate	IP20			
Operating temperature range	-40 °C to 70 °C			
Mounting	2 x ø 5,5 mm hole	4 x ø 5,5 mm hole	2 x ø 5,5 mm hole	2 x ø 5,5 mm hole
Weight	0,89 kg	1,90 kg	0,98 kg	
Dimensions (w x h x d)	(33 x 233 x 116) mm	(55 x 233 x 116) mm	(33 x 233 x 116) mm	(33 x 233 x 116) mm
Standards	EN 50155, EN 50121-3-2, EN 45545-2			

ETHERNET SWITCHES WITH RJ45

	RB-SW060/CR1	RB-SW0B0/CR1
Number of ports	6	12
Ports with PoE	-	
10 / 100 / 1000 Mbps	6	12
Connectors	RJ45	
Power supply	16,8 V to 33,6 V DC	
Power consumption	Max. 0,3 A at 24 V DC	Max. 0,5 A at 24 V DC
Cover protection rate	IP20	
Operating temperature range	-40 °C to 70 °C	
Mounting	2 x ø 5,5 mm hole	4 x ø 5,5 mm hole
Weight	0,98 kg	1,20 kg
Dimensions (w x h x d)	[33 x 233 x 116] mm	[55 x 233 x 103] mm
Standards	EN 50155, EN 50121-3-2, EN 45545-2	



ETHERNET UNITS

UNMANAGED SWITCHES



- 6 and 12 ports Ethernet switches
- 10 / 100 Mbps / 1 Gbps
- Robust vibration-proof
- PoE version available
- Connections with M12 or RJ45
- Wide operating temperature range -40 °C to 70 °C
- EN 50155 compliant

ETHERNET SWITCHES WITH M12

	RB-SW006/AM1	RB-SW006/NM1
Number of ports	5 + 1	5 + 1
Ports with PoE	5	-
Ports without PoE	1	5 + 1
10 / 100 / 1000 Mbps	-	-
10 / 100 Mbps	5	-
100 Mbps	1	-
Connectors	M12, D-coded	
Power supply	16,8 V to 33,6 V DC	9 V to 33,6 V DC
Power consumption	Max. 2,2 A at 24 V DC	Max. 0,2 A at 24 V DC
Cover protection rate	IP20	
Operating temperature range	-40 °C to 70 °C	
Mounting	4 × ø 6 mm hole	2 × ø 6 mm hole
Weight	1,20 kg	0,87 kg
Dimensions (w × h × d)	[74 × 180 × 121] mm	[33 × 234 × 99] mm
Standards	EN 50155, EN 50121-3-2, EN 45545-2	

ETHERNET SWITCHES WITH RJ45

	RD-SW006/AR1	RB-SW006/NR1
Number of ports	5 + 1	5 + 1
Ports with PoE	5	-
Ports without PoE	1	5 + 1
10 / 100 / 1000 Mbps	-	-
10 / 100 Mbps	5	-
100 Mbps	1	-
Connectors	RJ45	
Power supply	16,8 V to 33,6 V DC	9 V to 33,6 V DC
Power consumption	Max. 2,2 A at 24 V DC	Max. 0,2 A at 24 V DC
Cover protection rate	IP20	
Operating temperature range	-40 °C to 70 °C	
Mounting	35 mm DIN rail	2 × ø 6 mm hole
Weight	1,02 kg	0,70 kg
Dimensions (w × h × d)	[65 × 124 × 126] mm	[33 × 193 × 88] mm
Standards	EN 50155, EN 50121-3-2, EN 45545-2	

ETHERNET UNITS

CONVERTERS



- Ethernet / CAN / RS485 / I/O converters
- Robust vibration-proof Ethernet connections with M12
- Wide operating temperature range -40 °C to 70 °C
- EN 50155 compliant

ETHERNET CONVERTERS

	RRC-PP3 (Ethernet / CAN / RS485)
Ethernet	1× 100 Mbps Full Duplex, M12, D-coded / IO
RS485 interface	2× with galvanic isolation, D-Sub DE-9
Power supply	16,8 V to 33,6 V DC
Power consumption	Max. 0,1 A at 24 V DC
Cover protection rate	IP20
Operating temperature range	-40 °C to 70 °C
Mounting	2 × ø 6 mm hole
Weight	0,7 kg
Application software	Project customized

ETHERNET CONVERTERS

	RRC-PP4 (Ethernet / CAN / RS485)
Ethernet	1× 100 Mbps Full Duplex, M12, D-coded / IO
RS485 interface	2× with galvanic isolation, D-Sub DE-9
CAN	1× (concatenation)
Power supply	16,8 V to 33,6 V DC
Power consumption	Max. 0,15 A at 24 V DC
Cover protection rate	IP20
Operating temperature range	-40 °C to 70 °C
Mounting	2 × ø 6 mm hole
Weight	1 kg
Application software	Project customized

ETHERNET - I/O CONVERTERS

	RRC-PP5 (Ethernet / CAN / RS485)
Ethernet	1× 100 Mbps Full Duplex, M12, D-coded / IO
RS485 interface	2× with galvanic isolation, D-Sub DE-9
CAN	2× (concatenation)
Digital I/O	16 × DI , 2 × DO , 24 V DC
Power supply	16,8 V to 50,4 V DC
Power consumption	Max. 0,15 A at 24 V DC
Cover protection rate	IP20
Operating temperature range	-40 °C to 70 °C
Mounting	4 × ø 6 mm hole
Weight	1,3 kg
Application software	Project customized
Standards	EN 50155, EN 50121-3-2, EN 45545-2

ETHERNET UNITS

ROUTERS



- Ethernet ECN router
- Robust vibration-proof Ethernet connections with M12
- Wide operating temperature range -40 °C to 70 °C
- Supplied for example as vehicle computer
- EN 50155 compliant



ETHERNET ROUTER

	RB-RTE040/00A
Ethernet	4*
Port types	2* ETB, 2* ECN
Communication rate	10 / 100 / 1000 Mbps Full Duplex
Connectors	M12, X-coded
Power supply	16,8 V to 50,4 V DC
Cover protection rate	IP20
Operating temperature range	-40 °C to 70 °C
Mounting	4 × ø 6 mm hole
Weight	1,9 kg
Application software	Project customized
Standards	EN 50155, EN 50121-3-2, EN 45545-2

ETHERNET ROUTER

	ERT03
Ethernet	3*
Port types	2* ETB, 1* ECN
Communication rate	100 Mbps Full Duplex
Connectors	M12, D-coded
Power supply	16,6 V to 30 V DC
Power consumption	Max. 0,15 A at 24 V DC
Cover protection rate	IP20
Operating temperature range	-40 °C to 70 °C
Mounting	2 × ø 6 mm hole
Weight	0,7 kg
Application software	Project customized
Application software	EN 50155, EN 50121-3-2, EN 45545-2

ASSOCIATIONS

AMiT is a member of:

ACRI [Association of the Czech Railway Industry]

SDP ČR [Association of Transport Companies of Czech Republic]

IEC TC9 WG43 for TCN [IEC 61375]

IEC TC9 WG46 for Onboard Multimedia and Telematic Services [IEC 62580]

UIC-IEC Trainet & Multimedia Group

ESG

ISO 14001 Enviromental Management System.

All products fulfil EMC / EMI according **EN 50155** and **EN 50121-3-2**.

Company fulfil **REACH** and **ROHS** legislation requirements.

Reliable **lead-free** soldering technology.

Reducing

Minimization of electric energy consumption

Minimization of product weight

Minimizing packaging

Reusing

Company know-how

Universal units

Recycling

Easily recycled products



WE ARE CERTIFIED

ISO 9001

Quality Management System

ISO 14001

Environmental Management System

ISO 27001

Information Security Management System

ISO 45001

Occupational Health and Safety Management Standard

Technical Standards

EN 50155

Railway applications -
Electronic equipment
on railway vehicles

EN 45545

Railway applications -
Fire protection of railway
vehicles

UIC 556 Decree

TSIs 2001/16ES

Declaration of Conformity with the Standards

Upcoming

EN 15085

Railway application -
Welding of railway
vehicles and components

EN 17460

Bonding on
railway vehicles and
parts thereof

REFERENCES

Rolling Stock Manufacturers

SIEMENS

ABB

ŠKODA

DURMAZLAR

ZOS VRÚTKY

pesa

STADLER

CAF

MITSUBISHI
ELECTRIC
Changes for the Better

newag
GROUP

Talgo

BHEL

Integrators

Cegelec

WAGNER

T-Systems

DPOV
Člen Skupiny ČD

SITAV

R&G
PLUS

Operators

MAU-START

ŽELEZNICE SLOVENSKA
SLOVAKIA

REGIOJET
[STUDENT] AGENCY

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express

adif
ALTA VELOCIDAD

RFI
RETE FERROVIARIA ITALIANA

LTG LINK



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