Digital Network Solutions

The Future of Trans-portation

ELTEC systems

SMART CONNECTIVITY

We Shape the Future of Smart Mobility

ELTEC

In Numbers

100+ Customers

25+ Countries

40+ Years Experience

The transportation industry is a vast ecosystem which covers everything related to the major modes of transport: rail, road, air and marine. It comprises passenger transport as well as cargo and is facing challenges to implementing technological breakthroughs and automation in an environment of constantly increasing user numbers, connectivity and digital data.

Digitalization is the key to enhance reliability, safety, efficiency and performance of public transportation and mass transit by enabling and supporting services as traffic management, Predictive Maintenance and digital train control.

An ever increasing number of users of public transport including trains, underground railways and buses is using Internet services and mobile applications for mobile work, to organize their travels or to shorten travel time by using infotainment services every day. Within the context of exceptionally high passenger density and volatility the ultimate availability of mobile services with highest bandwidths has become the key to customer attractiveness. Maintaining a stable land connection while moving with high-speed through the providers' network cells or to track-side Wi-Fi infrastructure is even a bigger challenge.

ELTEC digital network solutions include components for a high-speed train-to-ground communication, stable and secure Internet access, real-time passenger infotainment, interfaces to the railway infrastructure for Predictive Maintenance, rail operations and fleet management as well as dedicated cable and antenna solutions.

ELTEC products comply with all common railway and industrial standards. Furthermore, ELTEC's product roadmap is committed to embrace new technologies like 5G, Wi-Fi 6, etc. as soon as they get available on the market.

We boost the performance of the following types of vehicles

High Speed and long distance trains
Regional and urban commuter trains
Metro and light rail trains
Public Bus Transportation and Coaches
Cargo Trains and Vehicles
Track-Side and Outdoor Environments

Pioneers

Since more than 40 years ELTEC has been a pioneer in micro-electronics. Until today we are designing forward-looking network and communications technologies for mobile applications in rugged environments with a variety of certified and proven products.

Innovations

As technology driver we develop innovative hardware and software, adopt cutting-edge technologies such as 4G, 5G, Wave 2, Wi-Fi 6 and customize solutions for special requirements in demanding applications. Our creative, innovative and highly-skilled team designs and produces network solutions for dedicated transportation markets.

Global Player

Our customers range from local to global manufacturers, operators and service providers, from many different industries and the public sector. As one of the leading players in embedded technologies and digitalization we bring expertise and know-how in our focus markets of rolling stock and vehicle applications – Made in Germany.

Strategic Partner

The provision of direct access to our sales and development team as well as the support throughout projects and flexibility in the adaptation of customer specific requirements were the basis for ELTEC to become a reliable and competent strategic partner for key industry players as of today.

Next to strong and long-term relationships with our customers a network of professional partners and alliances form the basis of our success.

unife
THE EUROPEAN RAIL INDUSTRY

DIGITAL NETWORK SOLUTIONS

LTE ROUTERS
Stable and secure LTE/5G connections for train-to-ground communication and Internet access

WI-FI ACCESS POINTS
High-speed, steady Wi-Fi connections with up to 256 clients per unit

WIRELESS GATEWAYS AND CONTENT SERVERS
Combined Wi-Fi access point and LTE/5G router including a server for media content as all-in-one solution

ETHERNET SWITCHES
Connection of network-compatible devices within a mobile or stationary network
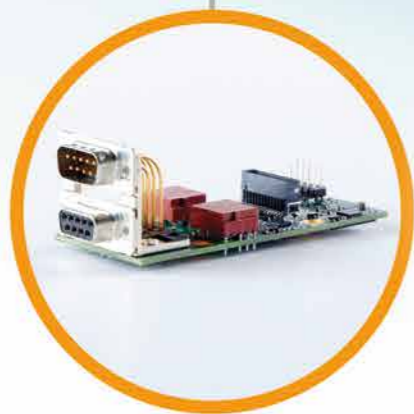
I/O MODULES
Interfaces for Condition Based Monitoring via MVB, CAN, serial bus and others

DATA CONCENTRATORS
Collection and analysis of sensor data, e.g. for Predictive Maintenance and the transfer of log data via wired and wireless networks

Certified products for harsh environments

EN 50155 COMPLIANT	E1 COMPLIANT
European standard for general electronic equipment on rolling stock	ECE type-approval confirming legal safety and environmental standards

TEMPERATURE   VIBRATION   SHOCK/RUGGED   HUMIDITY   MAINTENANCE FREE

WIRELESS COMMUNICATION SYSTEMS

To meet increasing customer expectations and enhancing passenger experience a stable, secure and interruption-free broadband connectivity is inevitable. Furthermore transferred information such as maintenance or operational data and sensor or positioning information are the basis for efficient fleet management, increased reliability and ultimate cost reduction opportunities.

ELTEC established a standard for reliable and stable communication combined with state-of-the-art transmission technologies providing secure Internet access to passengers and high-speed vehicle-land connections.

Access points enable passengers to use Internet services or to stream content and also collect data from sensors. In smaller installations, for example in buses or trams, a LTE router or gateway is used to hold the vehicle-land connection via LTE and simultaneously route the information to either wire-attached or wireless client devices.

Our products are particularly designed for demanding markets with requirements in terms of maximum throughput, physical and electrical robustness, as well as long-term availability and longevity of supply and service.

Your Benefits

- Highest performance on smallest footprint
- Family concept in terms of form, fit and function for scalability and longevity
- Ultra-wide-range power supply for worldwide usage in every type of train, fully railway compliant to EN 50155
- Various interface options with 1, 2.5 or up to 10 GbE to cope with increasing backbone data rates
- Optional integrated daisy chaining and/or Gigabit Ethernet switch, GPS and integrated storage
- Easy-to-use web interface with remote setting and remote update capability
- Cyber Security concept with client isolation and prevention of man-in-the-middle attacks
- Transparent Open Source operating system with all source codes provided
- Modular integration platform for future radio standards like Wi-Fi 6 and 5G

5G READY

- Latest cutting-edge technology with long-term availability and up to 60 months warranty
- Evaluation Kits for fastest time-to-market including all necessary accessories

Perfect User Experience

WIRELESS GATEWAYS AND CONTENT SERVERS

CYBOX GW-P

Maximum net coverage and bandwidth for train-based connectivity

5G READY

- Hosts up to 5 Wi-Fi and/or LTE/5G modems at the same time
- LTE-to-Wi-Fi gateway with hard disk interface and downstream Ethernet circuitry serving as media source in smaller systems
- Multi-provider support for maximum coverage and bandwidth aggregation for least cost and location based routing
- Up to 20 SIM cards for highest provider flexibility
- Multiple IO extensions for interfaces like MVB, CAN, serial, etc.
- High-end communication power with up to 8-core CPU
- Ready for Wi-Fi 6 and 5G

up to
8-core
CPU

up to
20
SIM cards

up to
5
modems

AUTOMOTIVE LTE ROUTERS

All-in-one solution for buses, coaches and small entities

5G READY

- Wireless router, access point and integrated 5-port switch in a compact box
- Additional interfaces for connecting in-vehicle bus systems
- Fits multiple modems such as Wi-Fi and LTE/5G
- Tracking via GPS for punctuality and availability to reduce costs (e.g. replacement bus) and for an optimal service
- Prepared for fleet management e.g. capacity optimization
- Future interface options for vehicle buses like CAN, IBIS, RS485, ODB2

CYBOX RT 2-A

5
GbE

up to
4
SIM cards

up to
4
modems

RAILWAY LTE ROUTERS

High-speed Internet connectivity in rough environments

PoE

Daisy
Chaining

Dual
LTE

- Stable train-to-ground communication
- Fits multiple Wi-Fi and UMTS/LTE modems
- Multiple-provider support with 4 SIM sockets per LTE modem
- GPS option for positioning information
- Daisy chaining for long backbone distances and to save expenses on external switches

CYBOX LTE 2

WI-FI ACCESS POINTS

CYBOX AP

CYBOX AP 2

CYBOX AP 3

CLIENTS
per Access Point
250

Most efficient and competitive passenger Wi-Fi with Gigabit Internet speed

- Unlimited surfing for up to 256 clients per access point
- One access point per wagon is sufficient
- Cutting-edge transmission technologies from Wave 2 to Wi-Fi 6 – soon to come
- Simultaneous live video streaming without interruptions for > 90 clients connected to one access point
- Load balancing and fast roaming
- Fail-safe backbone routing secured by embedded relays
- Daisy chaining for long backbone distances and to save expenses on external switches
- Inter-carriage coupling for retrofit applications

10 GbE

Wi-Fi 6 to come

Cyber Security

Wave 2
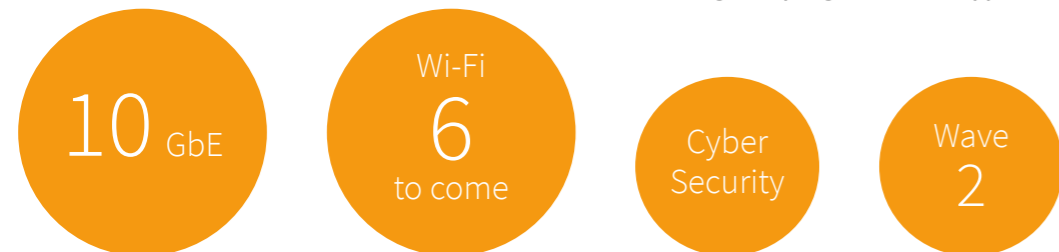
Inter-Carriage Coupling
The CyBox AP can also be implemented as wireless bridge between train carriages. Such wireless backbones are used in retrofit applications to substitute Ethernet cables laid through the carriage coupling. The firmware of the CyBox AP contains the Inter Carriage Connection Protocol ICCP, a bridging algorithm developed by ELTEC to automatically establish and maintain a wireless LAN backbone for trains.

DATA CONCENTRATORS

CYBOX ED-S

Data loggers for Condition Based Monitoring and Predictive Maintenance

- Comprehensive selection of interfaces to collect maintenance data from vehicle-internal devices
- Transmission of device data to land-based data centers
- For Gigabit Ethernet as well as WAN connectivity
- Integrated UIC 559-converter
- Small, compact and ruggedized IP54 casing
- Supported by a full set of robust M12 connectors for reliable connections
- Multiple I/O extensions for interfaces like MVB, CAN, serial, etc.

Starter Kit DRIVE 1.0

- ELTEC CyBox ED-S including all necessary accessories such as antennas, cables, power supply and adapters
- 3 months SPLUNK industrial IoT license for long term storage and analytics
- Operator specific dash boarding by IT experts of ESE

DRIVE 1.0

I/O MODULES

MVB and CAN as stand-alone mezzanine boards or integrated modules

CYBOX IO MVB

MVB MODULE

Train-based interface for absolutely secure communication with critical infrastructures

- Unidirectional read-only version ensures no interference with control processes, bus signals or writing – bidirectional version also available
- IEC 61375 compliant
- Supports medium and short distance train configurations – available as ESD+ and EMD module
- Prepared for CyBox GW-P or CyBox ED-S integration

CYBOX IO CAN

CAN MODULE

Data acquisition in the automotive environment

- ISO 11989 supported in hardware for CAN V2.0B
- Standard galvanic isolation
- Prepared for CyBox GW-P or CyBox ED-S integration

CYBOX ES

9 x 1 GbE

2 x 2.5 GbE

ETHERNET SWITCHES

Connection of network-compatible devices within a mobile or stationary network

- Rugged switch for in-vehicle use for railway and automotive
- Multiple Gigabit performance with up to 11 ports for high-speed backbones
- Highest throughput offers sufficient bandwidth for latest connectivity standards
- Multiple variants with lightly and fully managed switch
- Optional PoE version

BUILT-IN CYBER SECURITY

Access Security and Data Security by Design

No Hidden Backdoors

- No Hidden Backdoors
- Prevention of man-in-the-middle attacks
- Built-in firewall
- Client-isolation
- Optional secure boot
- Open VPN tunneling
- Encrypted Wi-Fi
- Password protected access
- WIPS support

Software Features

Our products provide elaborate management software, offering extensive means to configure the devices using their web interface or at the command line level by dedicated commands and scripts. The integrated and programmable firewall ensures maximum security, also by isolating clients from each other.

Original Connection

Man in the Middle