Train Control and Management System (TCMS)

The Trainnet® TCMS improves train performance and safety while decreasing maintenance and operating costs.

The Trainnet® Train Control and Management System (TCMS) provides a single point of control over all train sub-systems. The TCMS enables control and monitoring over virtually any sub-system and function, for instance doors, brakes, PIS/PA and video surveillance, to name a few.

Using a unique control and management system allows for a simplified Train Communication Network (TCN). The train architecture becomes more efficient, thus saving on development and maintenance costs. In addition, the centralized TCMS is used to automate train operations and sub-system diagnostics, enabling increased reliability and quicker response times.

EFFICIENT INTEGRATION

The core of the Trainnet® TCMS is the Trainnet® Train Communication Network (TCN). The Trainnet® TCN is the infrastructure enabling the exchange of information throughout the train. It connects all the train sub-systems together *via* a common network (or several when requested), enabling centralized control.

In practice, the TCN consists of train computers, commonly referred to as Gateways, connected to each other as well as to train sub-systems. Trainnet® Gateways support multiple interface technologies including WTB, MVB, CAN, Serial Links and Ethernet. For more detailed information, please refer to the TCN and Gateway sections.

TRAIN AUTOMATION

The Trainnet® TCMS can be used to automate the train sub-systems. In most modern trains, on-board sub-systems generate a large quantity of data which is essential for safety (speed, braking, faults etc.) and operation purposes (system status, energy consumption, video recording etc.). The Trainnet® TCMS is able to gather this data, analyse it, and send logical commands and warnings. The information can be automatically exchanged between sub-systems and conveyed in real time to the train driver, the train captain, remotely located personnel and even passengers.

The Trainnet® TCMS is a versatile train computer which can be used in a number of applications such as:

- Diagnostics
- Automatic Train Inauguration
- PIS/PA system management
- Crew HMIs management
- Brakes and traction monitoring
- SIL and Safety Applications
- Fleet Management
- HVAC management
- Door management
- Lighting management
- CCTV system management
- Tank level monitoring
- Battery charge monitoring
- Train-to-wayside communication management

For more detailed descriptions of these applications, please refer to the Application Software section.

Trainnet® enables these applications to run on the same train computers that are used for Gateway functionalities, providing a more compact and cost-effective solution. Physically separated train computers can also be implemented, sometimes referred to as Vehicle Control Units (VCU).

Trainnet® systems provide all the necessary interfaces to connect with the sub-systems and the Train Communication Network.

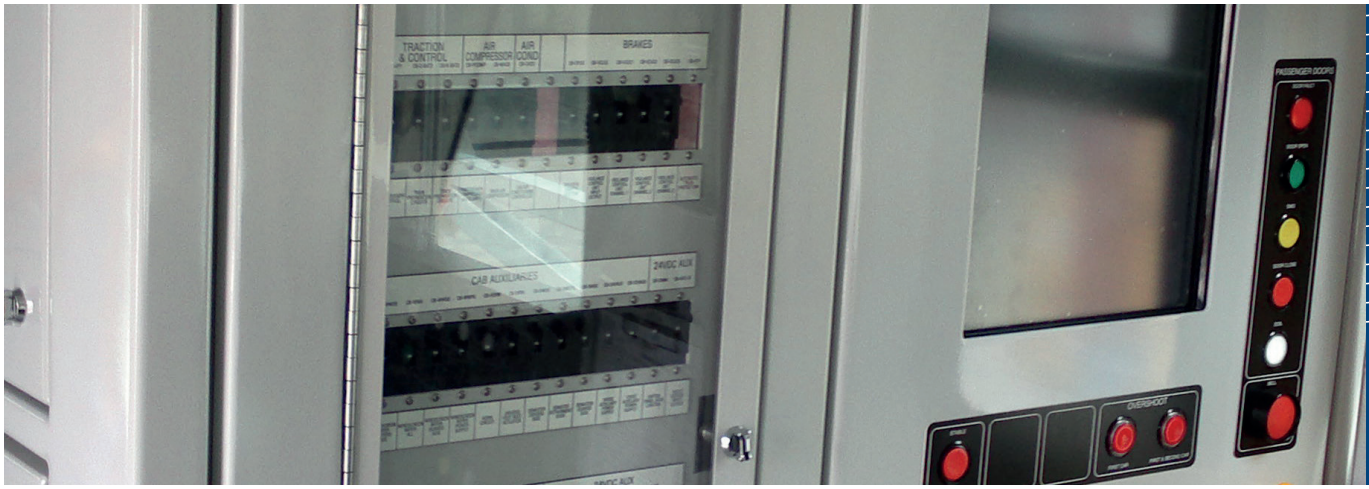
Advantages

Versatility
Cover all your needs with a single system.

Modularity
Only pay for the features you need.

Open software
Keep control over your project at all times.

Long term support
Get support during the lifetime of your project.



Available technologies include a wide range of Bus Interface Modules (e.g. WTB, MVB, CAN, Serial Links and Ethernet) and Input/Output Interface Modules (Analogue Input, High Speed Analogue Input, Digital Input/Output, Digital Relay Output, Analogue Output, Pt-100 temperature Sensor Input). Remote Input/Output Modules (RIOM) are also available.

MORE CONTROL

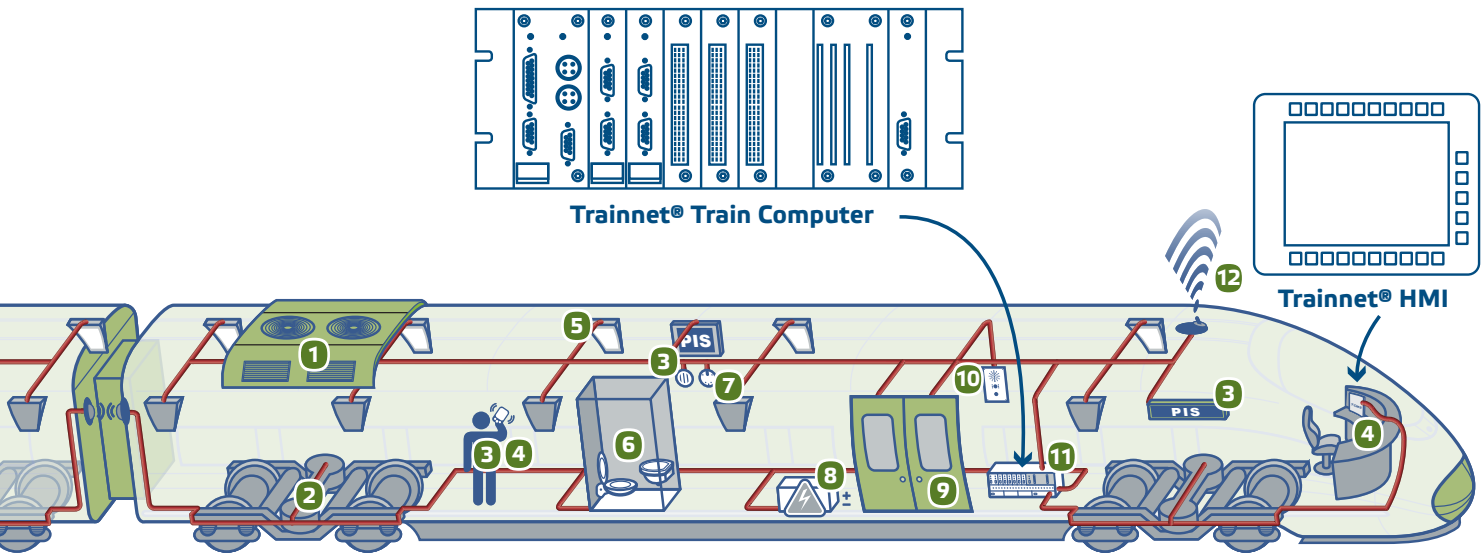
The Trainnet® TCMS is a powerful and highly flexible system built on an open source software platform (Linux). You are free to develop your own applications as well as to integrate third party Hardware and Software onto the Trainnet® platform. With Trainnet®, you can develop your own applications using the CODESYS PLC Software. You can also develop applications as well make configuration modifications in C language, giving you full control. EKE has the expertise to develop all or a part of the Software for you, or alternatively provide training, tools and guidance to support your own developments. Finally, EKE can grant you the intellectual property rights (IPR) of the application Software in order to ensure you a safe, long-term investment.

On the Hardware side, the Trainnet® TCMS is modular. This means you can develop tailored systems matching your needs perfectly. By simply selecting the interfaces you need, you make sure the system answers all your demands while being cost-efficient. Systems can be easily upgraded with additional modules as needs arise.

QUALITY AND RELIABILITY

The outstanding quality and the unique design of Trainnet® products guarantee unparalleled reliability. Trainnet® products minimize the need for maintenance while maximizing train availability, providing a long-term cost benefit for operators. We provide support for more than 30 years in order to ensure that our customers are satisfied during the entire life-time of their project.

EKE is IRIS certified and Trainnet® complies with the railway industry standards, including the IEC 61375 series, IEC 61131 and EN 50155.



TRAINNET® TCMS, FOR THE MONITORING, CONTROL AND AUTOMATION OF:

1. *HVAC*
2. *Bearing temperature (SIL-2)*
2. *Speed measurement (SIL-2)*
2. *Lateral vibration (SIL-2)*
2. *Brakes*
2. *Traction*
3. *PIS/PA*
4. *Diagnostics*
5. *Lights*
6. *Water tanks*
7. *CCTV*
8. *Batteries*
9. *Doors*
10. *Emergency communications*
11. *Data protection (event recorder)*
12. *Train-to-wayside communications*