MITSUBISHI ELECTRIC
Changes for the Better

for a greener tomorrow eco Changes

Ethernet-based TCMS (Train Control and Monitoring System)

Mitsubishi Electric is providing TCMS based on train-wide Ethernet communication and train to wayside wireless communication for reliable and efficient train operation.

Ethernet (100BASE-TX) network

High-speed and open network
IEC61375 (Ethernet Train Backbone/Ethernet Consist Network)

Network Topology

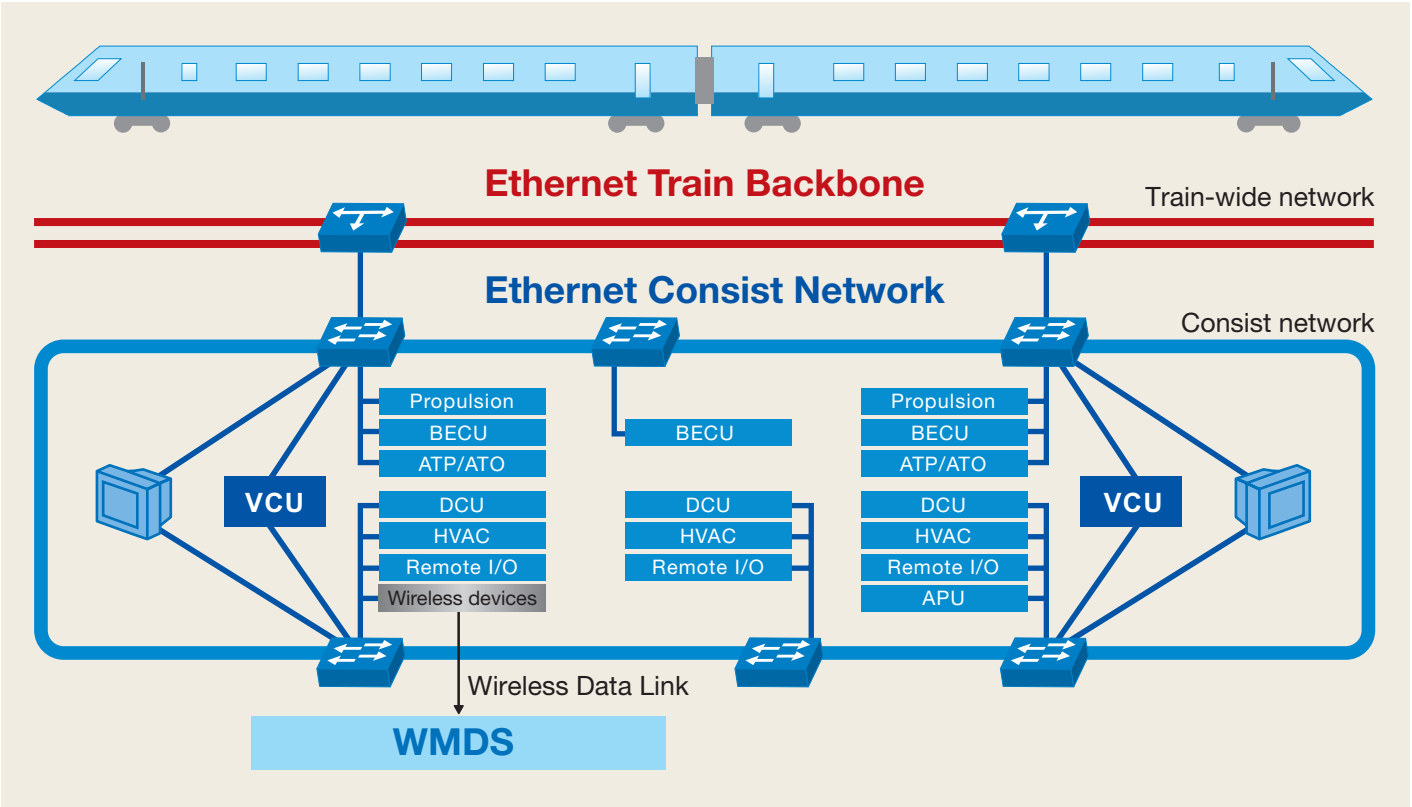
Data transmission through two independent networks
(Train-wide Network/Consist Network)

Reduction of Hard-wires

Reduced in-car hard-wires by transmitting the control command and applying the Remote I/O

Data transmission to WMDS

Remote monitoring, diagnosis and parameter setting of onboard equipment



Network Configuration

VCU : Vehicle Control Unit
BECU : Brake Electronic Control Unit
ATP : Automatic Train Protection
ATO : Automatic Train Operation
DCU : Door Control Unit
Remote I/O : Remote Input / Output Unit
HVAC : Heating, Ventilation, and Air Conditioning system
APU : Auxiliary Power Supply Unit
WMDS : Wayside Monitoring and Diagnostic System

- **High bandwidth train-wide network enhances all TCMS functions; equipment monitoring, maintenance support, train testing support, service equipment control and integrated control.**
- **Data communication to WMDS enhances two TCMS functions; equipment monitoring and maintenance support.**

Maintenance Support

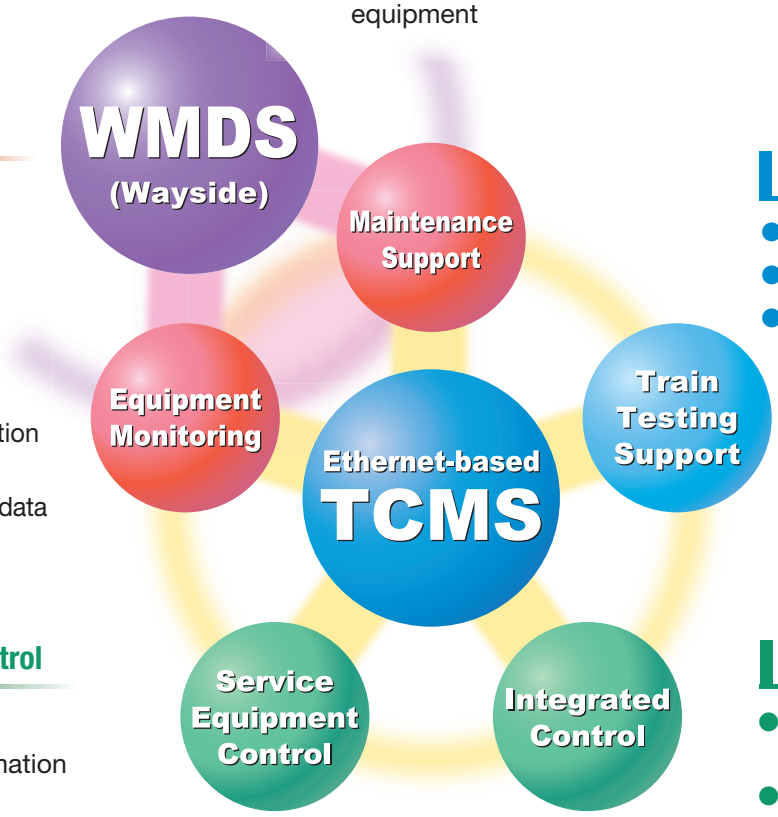
<WMDS>
- Fault analysis and diagnosis
- Remote setting of onboard equipment

<TCMS>
- Fault detection and recording
- Operation history

Equipment Monitoring

<WMDS>
- Remote monitoring of onboard equipment
- Virtual cab

<TCMS>
- Equipment monitoring and train condition indication in real time
- Reporting of maintenance data



Train Testing Support

- Onboard test
- Test run
- Automatic departure test

Service Equipment Control

- Interior light control
- Passenger service information indication
- Audio announcement system

Integrated Control

- Isolation and resetting onboard equipment
- Train-wide integrated brake control

eco Changes for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.

MITSUBISHI ELECTRIC CORPORATION

http://www.MitsubishiElectric.com