Mitsubishi Electric’s TCMS (Train Control and Management System) and WMDS (Wayside Monitoring and Diagnostic System) provide integrated solution for reliable and efficient train operation.

**TCMS (Train Control and Management System)**
- Ethernet (100BASE-TX) communication based on IEC61375
- Total control over onboard equipment operation
- Reduction of in-car hard-wires

**WMDS (Wayside Monitoring and Diagnostic System)**
- Remote monitoring and Virtual Cab screen
- Fault analysis and diagnosis
- Remote parameter setting of onboard equipment

**Communication between onboard and wayside**
- Wireless communication based on IEEE802 standard
- Priority control and bandwidth utilization
- Redundant communication

**CBM via TCMS and WMDS (Condition Based Maintenance)**
- Statistical data collection and visualization
- Predictive failure detection of equipment
- Train-set optimal control with TCMS

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**Operation Control Center**
(Control center personnel)

**Virtual Cab**

**Wayside**

**Shop**
(Maintenance personnel)

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**Equipment data visualization**

**Failure Detection Logic Editor**

**TCMS & WMDS**
Remote monitoring and diagnosis for stable train operation
WMDS Function Overview

- Setting of diagnostic parameters for onboard equipment from wayside
- Setting of predictive failure detection logic for onboard equipment
- Remote monitoring of train and car status
- Monitoring of Virtual Cab for the selected car
- Map view for the target train location
- Automatic detection of fault information and notification
- Acquisition of associated log collection and visualization
- Operation guidance support

Benefit for users

- Shortening of restoration time in case of failure
- Minimization of train operation downtime
- Reduction of workload on control center personnel and maintenance personnel

Functional Advantages

- Virtual Cab: Display simultaneously of the cab screen
- Diagnostic parameters and operation parameters of onboard equipment cab be set from wayside

Screen Sample of WMDS

Monitoring of train and car status screen
- Monitoring the status of trains of the entire fleet, Train and Car levels respectively.

Virtual Cab screen
- Virtual Cab screen allows the remote display of the cab screen of the selected car.

Failure detection logic editor screen
- Editing of onboard event detection logic using third party software standard package.

Graph view screen
- Graph display of the collected event device status (analog and digital).

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Specifications are subject to change without notice.