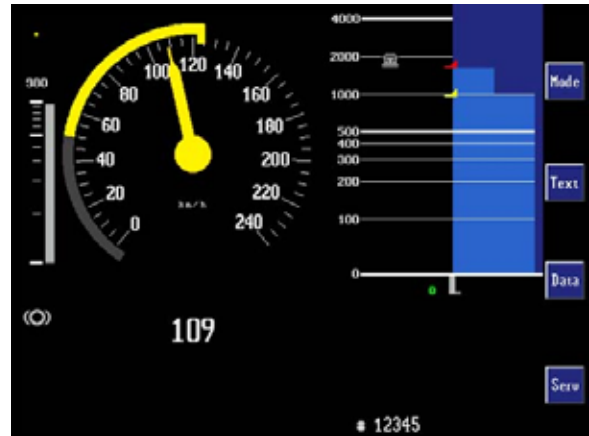


Railway Supervision System

- Custom 6U VMEbus master/slave board
- 2 LVDS channel links
- 4 MB dual-ported SDRAM
- VMEbus interface, LVDS and RAM implemented in FPGA
- 1 ESM™ Embedded System Module slot
- -5 to +70°C operation temperature
- Conformal coating
- No critical components (e.g. sockets)
- RTOS VxWorks®



Automated train control must be backed by an innovative and reliable security system. The interoperability of the signaling equipment with the train control, security and communication systems is crucial for safe, user-friendly and economical railway traffic.

Recent strategies and new projects try to build on the ERTMS (European Rail Traffic Management System) that aims to reach a compatible rail network through all European states and which has been initiated by the European Commission and leading railway representatives in 2005. ERTMS builds on ETCS and GSM-R. ETCS (European Train Control System) is the new control-command system and GSM-R is the new radio system for voice and data communication

The electronic equipment in this application is used inside an ETCS level 2 system. The exact train position is determined via a Doppler Radar under the traction vehicle and wheel encoders on the traction vehicle axes. Punctiform data transmission devices on the track (balises) are used for alignment (electronic milestones). The ECTS computer in the train transmits the measured position to the control center via Euroradio. The control center sends back to the train the needed information about the route, stops and speed.

The custom 6U VMEbus board designed as a part of the computer for the ETCS system provides two high-speed LVDS channel links for universal I/O on the VMEbus. It can be used as a reflective memory in a VMEbus system. The VMEbus master/slave interface is built up in FPGA.

The board supports two LVDS channels on the front, each channel with a transmitter and a receiver. HD-Sub connectors are used to interface the LVDS channels. Two LVDS 21-bit channel link controllers convert the I/O signals of the FPGA into three LVDS data streams and vice versa.

The one-slot wide, double Eurocard board comes with a slot for ESM™ Embedded System Modules, MEN's System-On-Module standard. ESM™ modules feature PowerPC® or Intel® processors and come with their own memory, communication interfaces and an FPGA for realization of application-specific I/O requirements. In order to route signals from the P3 connector of the ESM™ module to the VMEbus, the reflective memory board features a P0 connector.