Russian Railway Control System uses Dual SBCs for Redundancy

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For the Russian railway, Micromax Technology developed and implemented a specialized redundant SBC gateway computer system designed to work in the railway's Automatic Train Control (ATC) systems. Called the M-MAX 400 ST/2GTW, this gateway fail-safe computer provides the intelligent interface between each station's Automatic Interlocking Systems (AIS) CAN network and the RF modems for communication with every train. In addition, the RF transmission of signaling information adds redundancy and functionality the normal terrestrial ATC systems.

The M-MAX 400 SG/2GTW gateway system is a crucial part for effective communication and control within the entire ATC. For this reason, it was designed with dual computers featuring redundancy and failover to assure continuous operation. Due to the critical nature of the application and the harsh operating environment, all of the components of the M-MAX 400 gateway were required to be both highly reliable and highly rugged.

Each of the M-MAX 400 gateway's dual CPU system consists of a small form factor single board computer, a wide voltage input on-board power supply module, and three I/O modules; one with dual CAN ports, one with four serial ports, and a custom module to provide redundancy between the two systems. These three I/O cards utilize both the ISA bus and PCI bus.

Diamond Systems' Pegasus PC/104-Plus single board computer was selected as the SBC for each of these dual computing systems. Designed with an 800MHz LX800 CPU, Pegasus provided the right balance of CPU power and low cost for the application. In addition, Pegasus is designed for rugged applications, featuring an extended operating temperature of -40°C to +85°C and high resistance to shock and vibration. As PC/104-Plus SBC, Pegasus also provided both the necessary ISA and PCI buses for communication with the three I/O modules.

With the successful implementation of the M-MAX 400 ST/2GTW gateway systems with Diamond's Pegasus PC/104-Plus SBC, Micromax Technology has designed other embedded railway systems using Diamond's single board computers and I/O modules.

Micromax Technology is modernizing the Russian railway's network of rail stations and trains, ensuring improved management and communication within the entire network.

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