

Industrial PC for a trackside (railway) application



Challenge – Meeting trackside requirements for reliability, vibration and EMC compliance

A company who are a global supplier to the rail industry involved in both rolling stock and trackside equipment identified a specific need for a reliable, rugged embedded computer system that would run the software that they had developed for digital data recording of critical systems. The system also had to be capable of maintaining data integrity as the data could be used for evidential purposes.

Key system requirements

- Must be capable of running the proprietary data logging software developed by the company
- Must have removable drives
- Must meet standards for trackside equipment
- Must meet environmental (vibration and EMC) requirements for trackside equipment
- Must be capable of 24/7 operation in UK temperatures
- Must be designed for maximum reliability

Acal BFi solution

The solution developed by Acal BFi was based around an industrial mini-ITX Core i5 system, capable of operating at extended temperatures to cope with winter and summer operation. In order to maximise the reliability, and to meet the stringent vibration requirements, it was decided that the best way to achieve compliance would be to have no moving parts.

For the hard drives we selected rugged industrial solid-state drives in a removable caddy. The industrial drives, unlike commercial solid state drives, are designed to be fault tolerant, employing specific algorithms to ensure maximum data integrity and longevity.

We overcame the challenge of cooling without fans by developing a custom passive cooling solution to dissipate the heat generated by the processor, as well as a custom fanless power solution. This approach allowed us to develop a custom solution that was suitable for convection cooling.

To ensure standards compliance we used a combination of third-party test houses and our own, in-house EMC chamber. The resulting solution was a fully standards-compliant, convection-cooled, embedded PC perfectly suited to the customer's application.

Services provided

- System design and integration
- Pre-compliance testing
- Customer documentation
- System compatibility testing
- Compliance testing and certification
- Construction of OS and user software image and loading

