

Control of Maintenance Trains

- 3U CompactPCI® SBC F7
- Pentium® III, 850 MHz
- VGA/TFT graphics controller
- Windows® 98
- 3U CompactPCI® SBC F1N
- PowerPC® MPC8245, 300 MHz
- ELinOS Embedded Linux with RTAI
- 3U VMEbus SBC B11
- PowerPC® MPC8245, 300 MHz
- 16 binary outputs on M-Module™ M28
- 16 binary inputs on M-Module™ M31
- 16 analog inputs on M-Module™ M36
- 16 analog outputs on M-Module™ M62



For track-laying and track maintenance machinery, heavy stress by vibrations and shock during automatic ballasting or tamping as well as the wide temperature range during day and night operation need to be considered. At track laying machine may weigh up to 50 tons and can be more than 20 meters long. The majority of maintenance works must be done during nightly operation breaks. Deviations of the track geometry are allowed only within a few millimeters in all three dimensions. Thus, the electronic equipment for controlling and driving the maintenance trains and for measuring and visualizing the track geometry needs to be extremely rugged.

In this application a computer-aided tamping system based on 3U CompactPCI® is used to do the calculation and visualization of the track geometry with subsequent control of the track-laying process itself. The same system can be used to control the track geometry during the following periodic maintenance drives.

While the calculation and control is done in real-time based on a PowerPC® single-board computer under embedded Linux, the graphical user interface is based on a separate Pentium® III CPU card under Windows®.

A second measuring system can be used optionally on the same track-laying vehicles. It consists of several computer nodes that communicate over industrial Ethernet. The 3U VMEbus system is based on a PowerPC® single-board computer that calculates the absolute track error from a multitude of data. It controls the track tamping machine through a combination of digital and analog I/O M-Modules™ which are all optically isolated.