FIRST Robotics Linux-based Controller

Mike Anderson / The PTR Group, Inc.

What is demonstrated

Based on the Xilinx Zynq-7020 All Programmable SoC the NI roboRIO is a significant step forward for FIRST Robotics Competition Teams.

The mobile platform uses motor controllers, servos and several sensor packages to provide environmental awareness via the roboRIO controller. The roboRIO supports CAN, USB, PWM, GPIO, I2C, SPI and A/D in a convenient breakout package using standard RC servo wiring for most connections.

The file system is derived from Yocto/OE sources and uses BusyBox for the majority of user land. The WPILib user library provides robot APIs.

Hardware Information

Dual 667MHz ARM Cortex A9 cores.
256MBs RAM and 512MBs flash with 1 UART, 10 PWM, 4 A/D, 10 GPIO, I2C, SPI plus additional I/O on MXP

What was improved

This controller replaces a single core. VxWorks-based PPC 5200 unit. Students now get to learn and develop on Linux.
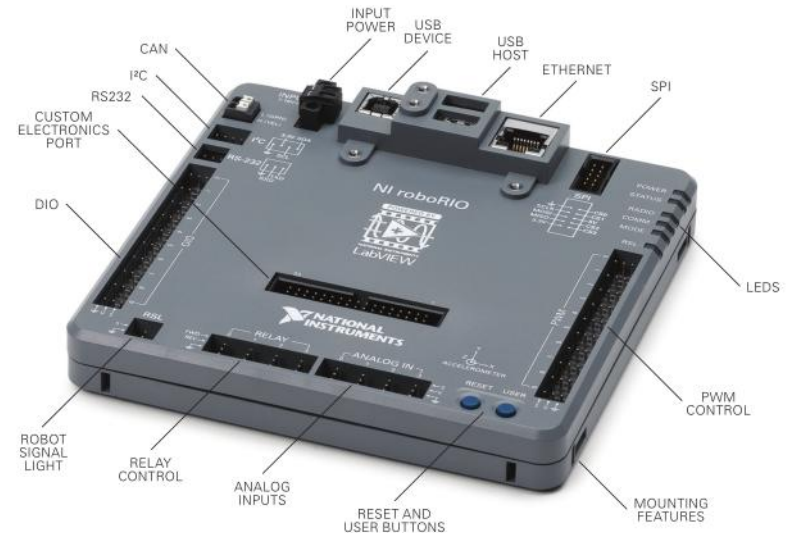
Source: NI.com

Source code or detail technical information availability

Source code for WPILib is available for download. Development environment is Eclipse and compiler is gcc 4.9. Contact me for details.