

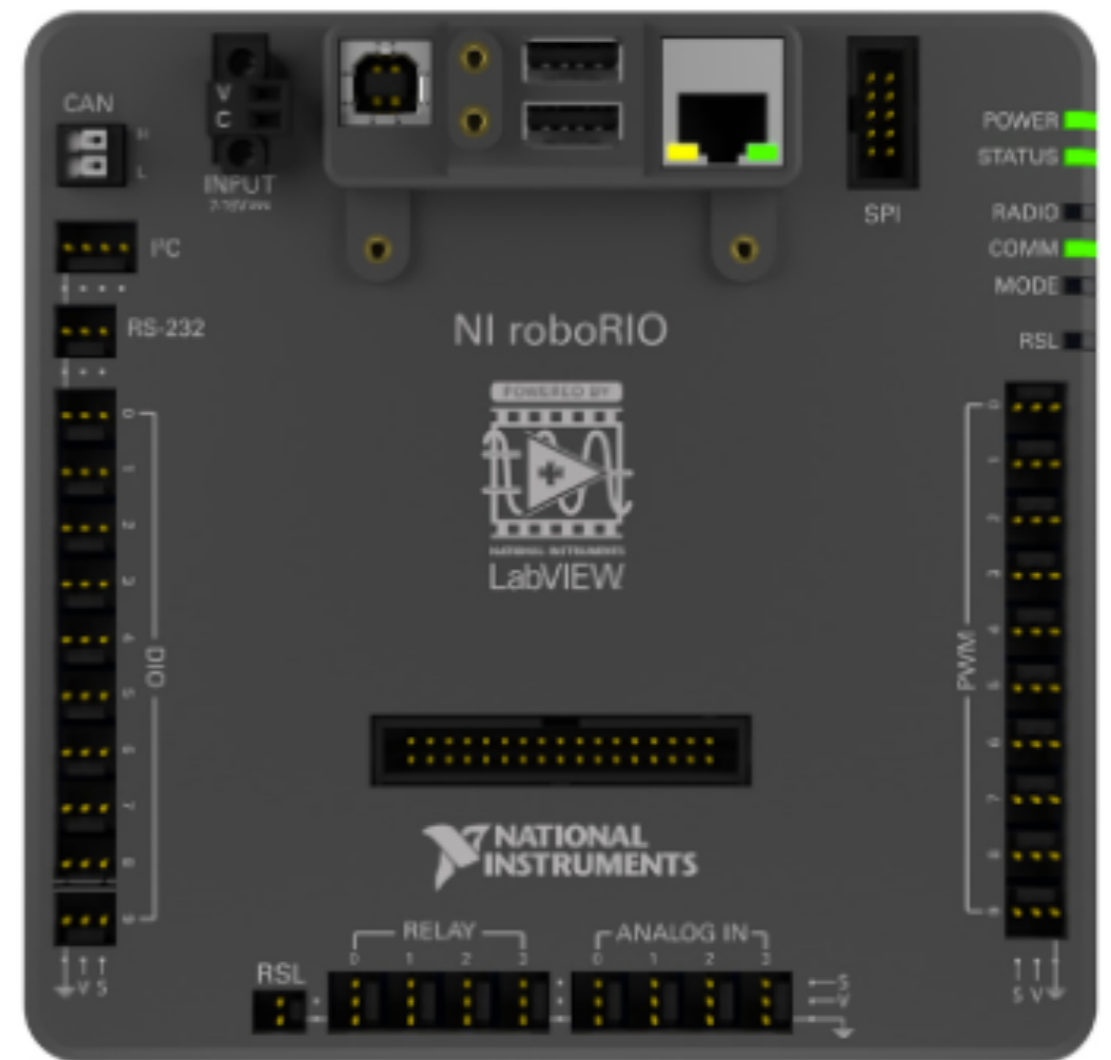
Agenda

- 2015 control system show and tell
- Programming in Java/C++ for 2015
- Programming in LabVIEW for 2015
- Sensors and sensing
- git and source code control systems
- Look at other sources of information

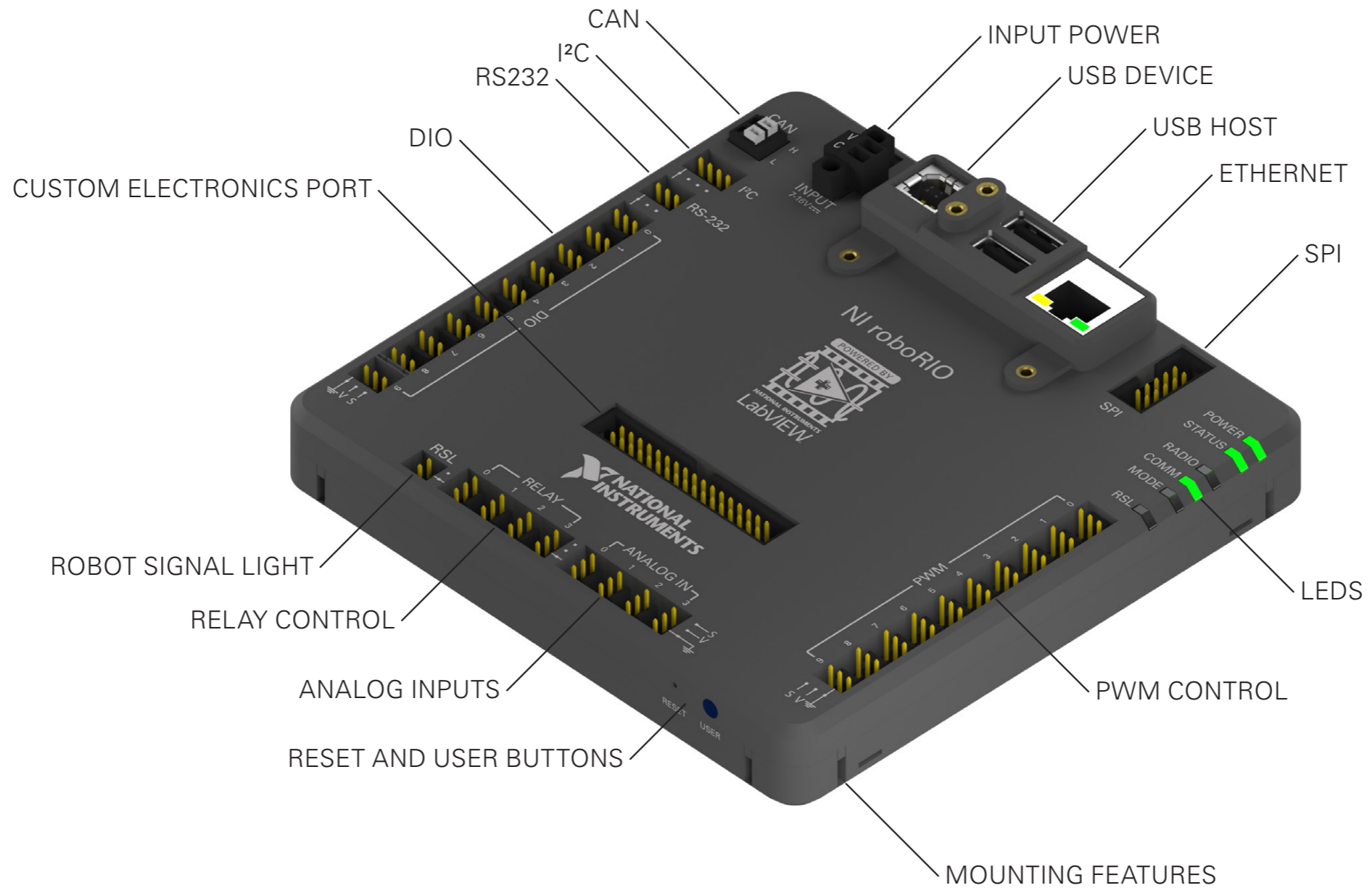
2015 Control System Preview

roboRIO

- Dual-core ARM Cortex-A9 and FPGA
- Ethernet, USB, CAN, SPI, I2C, and serial
- PWM, servo, DIO, Analog I/O

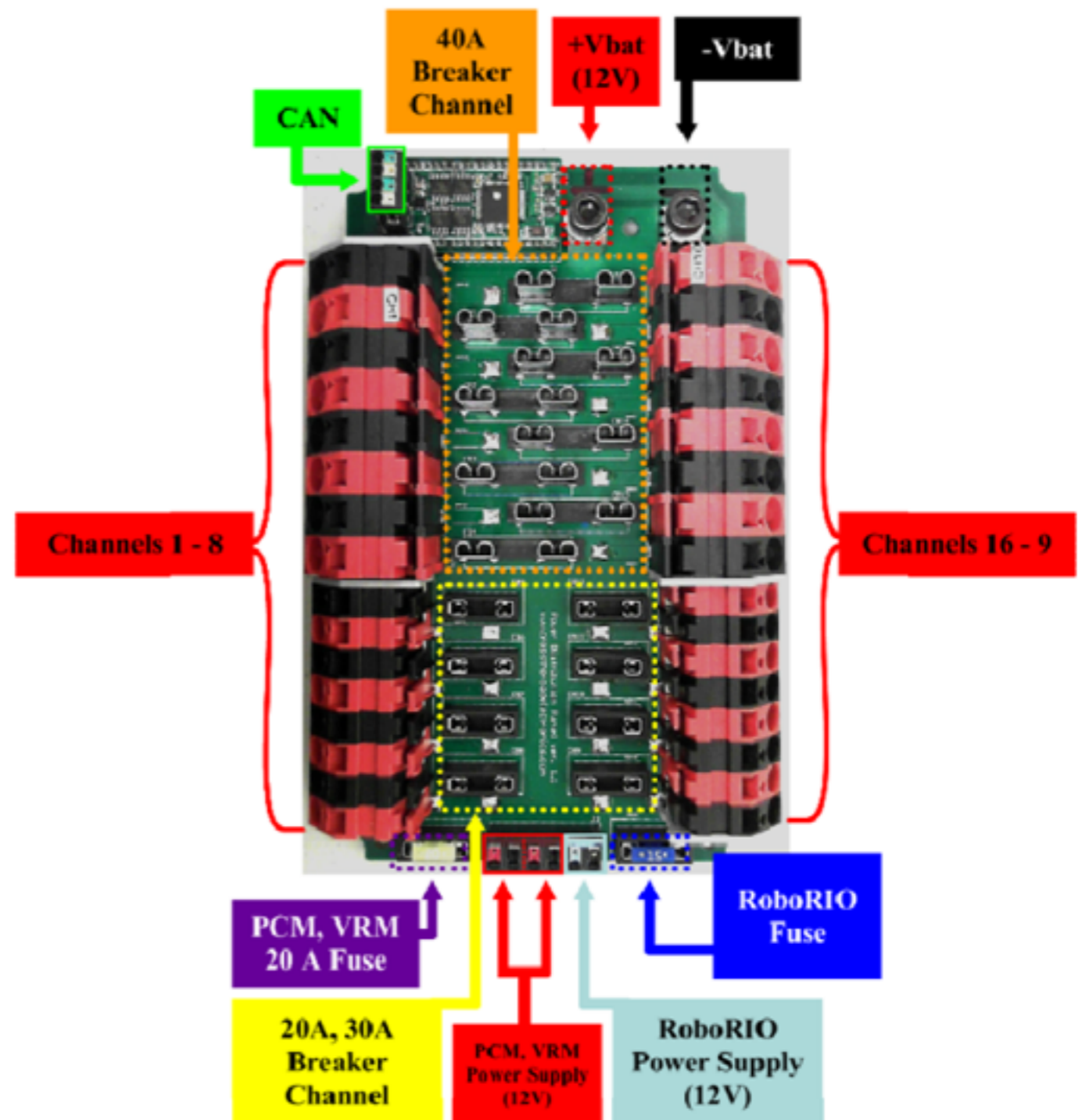


roboRIO



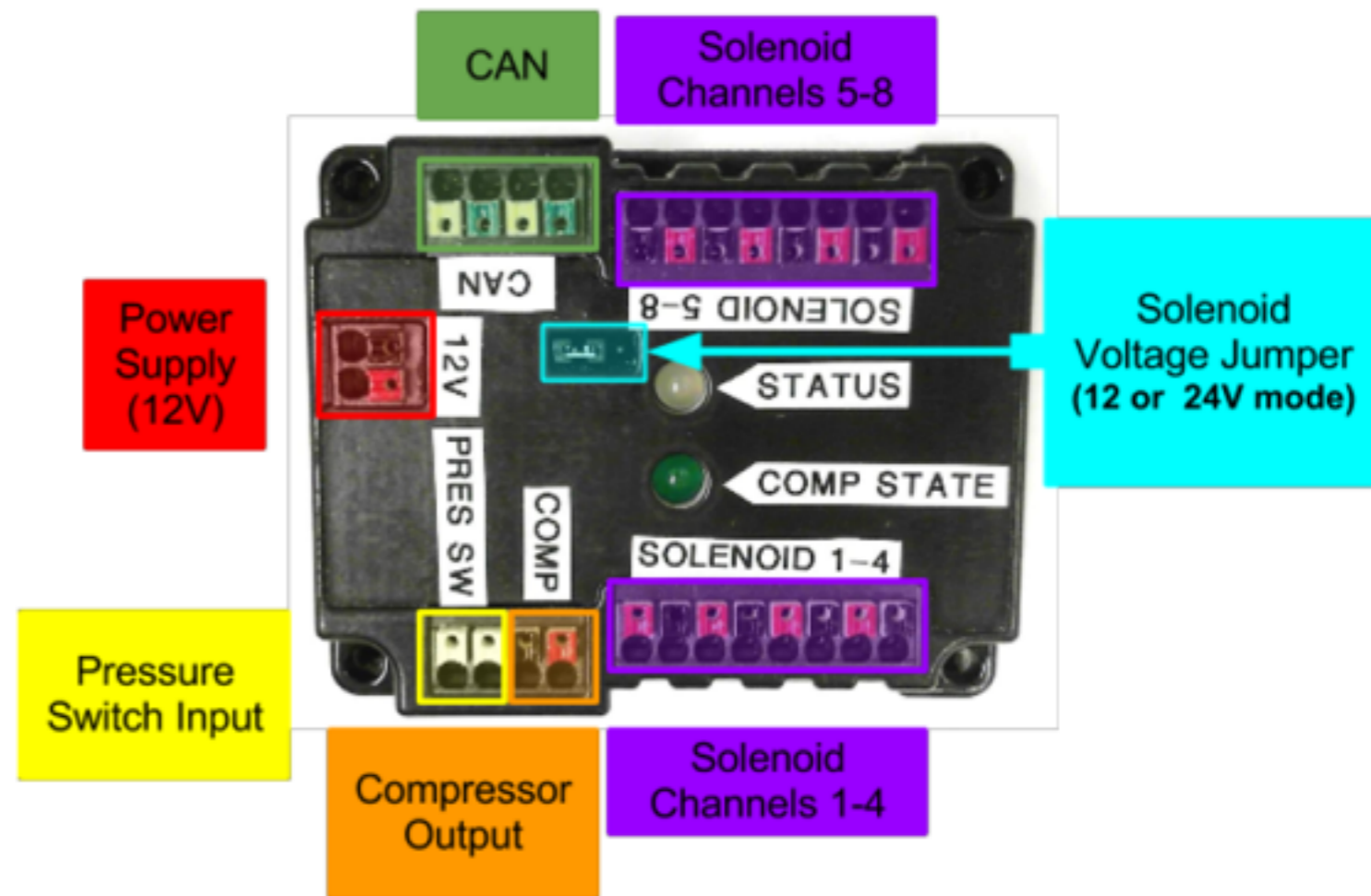
Power Distribution

- 12V thru circuit breakers
- Regulated supplies for RoboRIO, VRM and PCM
- CAN interface for logging current, temp, and battery



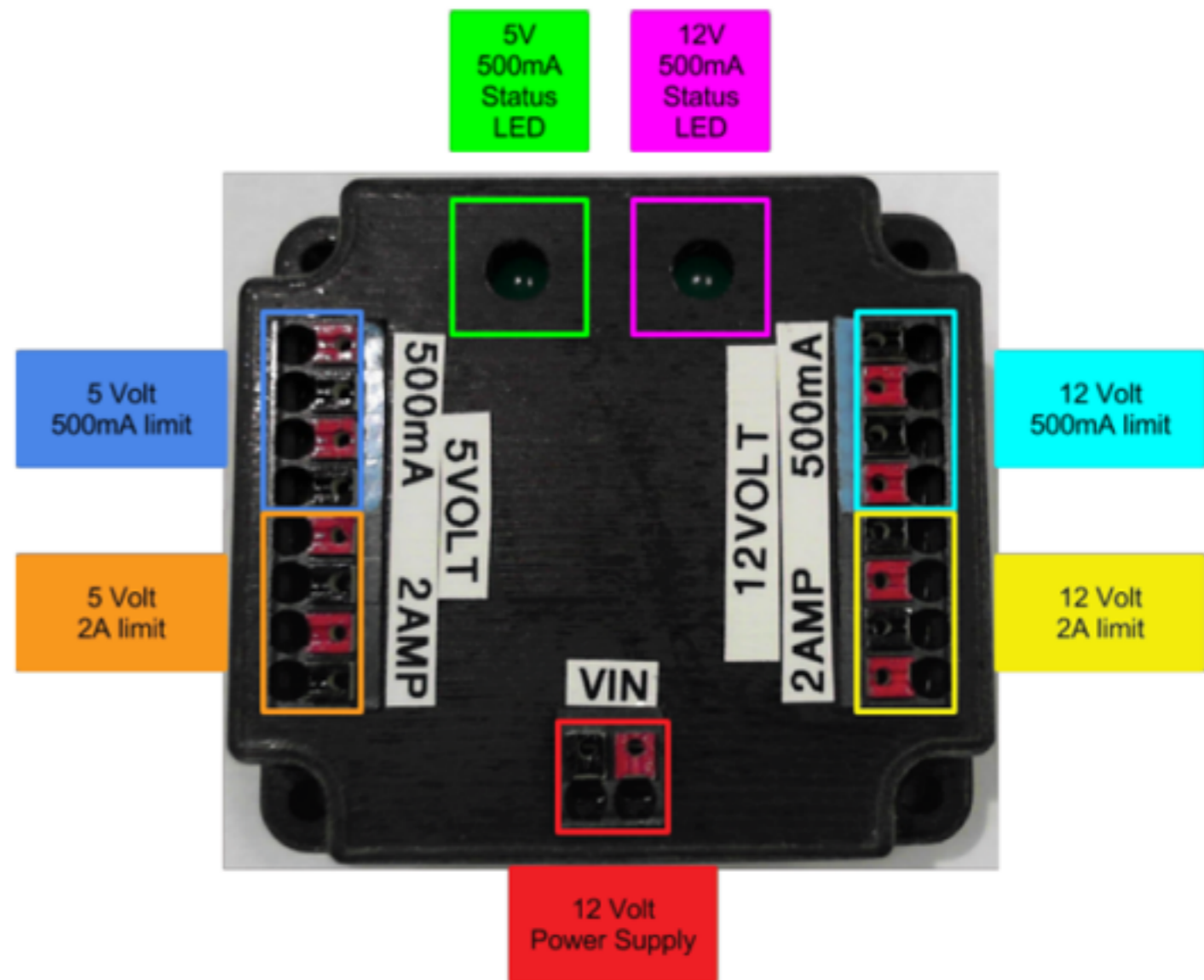
Pneumatics Control Module

- 12V or 24V pneumatics
- Compressor control
- CAN interface



Voltage Regulator Module

- Multiple regulated 12V and 5V outputs
- Power for D-Link radio, custom circuits, and IP cameras



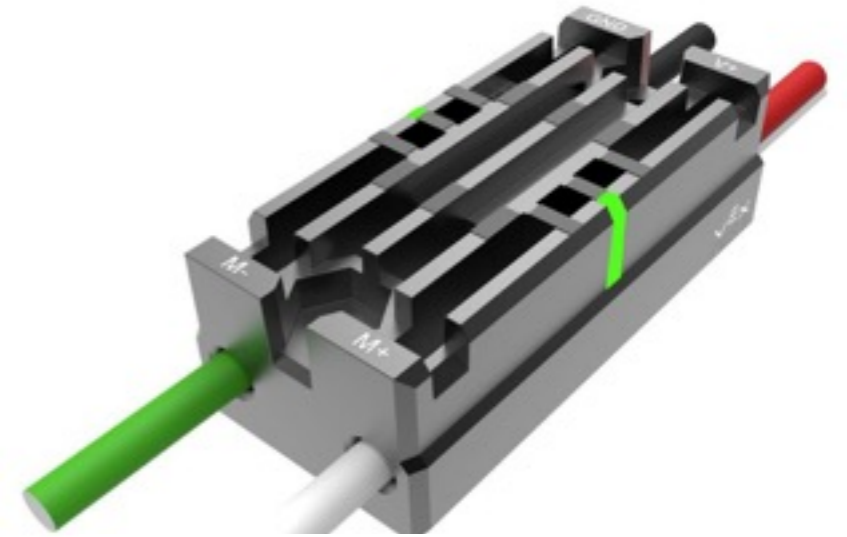
Communications

- D-Link 1522 radio will be used for 2015
- mDNS used to identify roboRIO and other network pieces - works with Ethernet, WIFI, and USB



2015 Speed Controllers

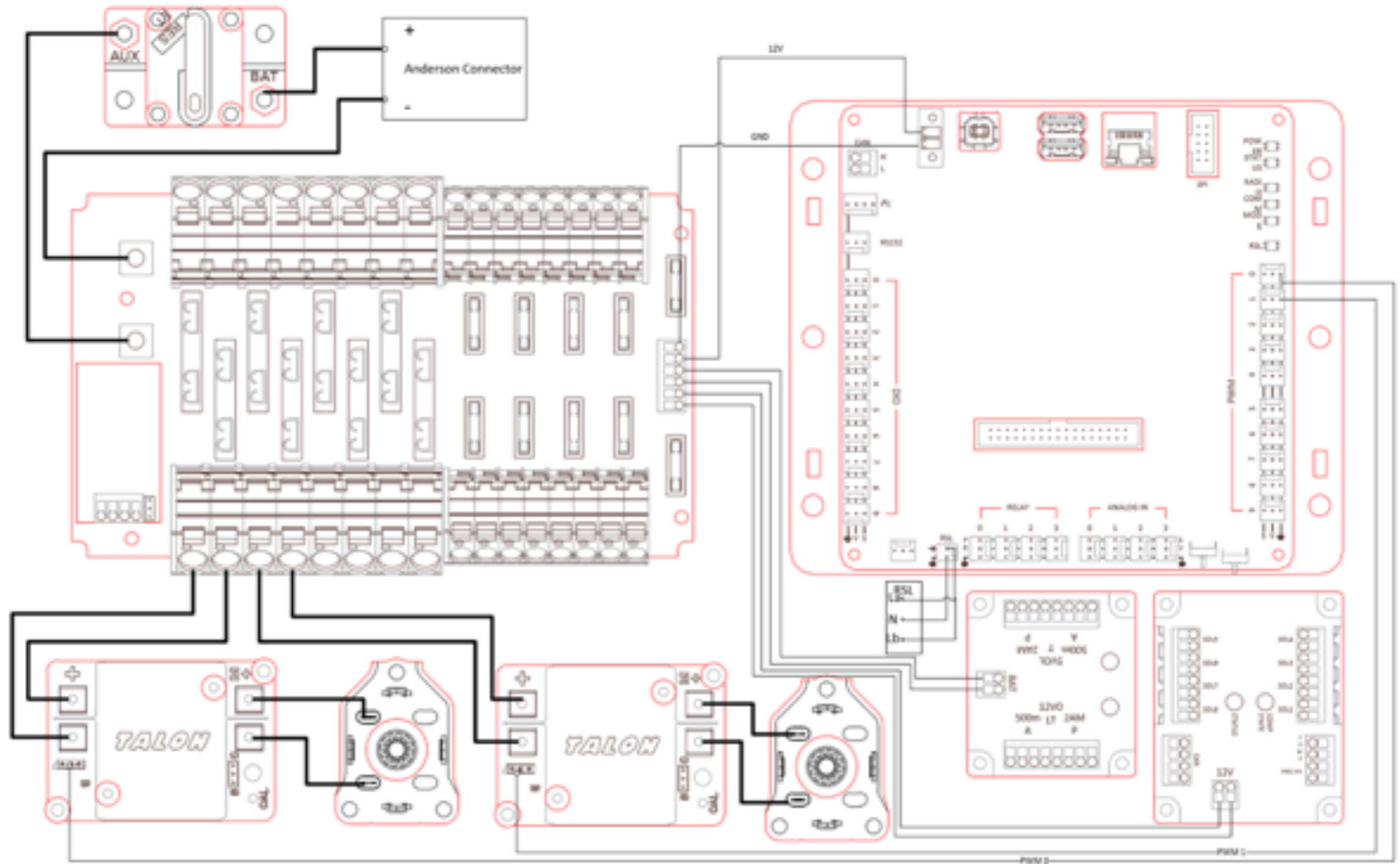
Victor SP - replacement for Victors and Talon SR



Talon SRX - replacement for Jaguar with full CAN control



Typical Wiring Diagram



Software

- RoboRIO based on Linux
- Full suite of WPILib languages
 - C++
 - Java
 - LabVIEW

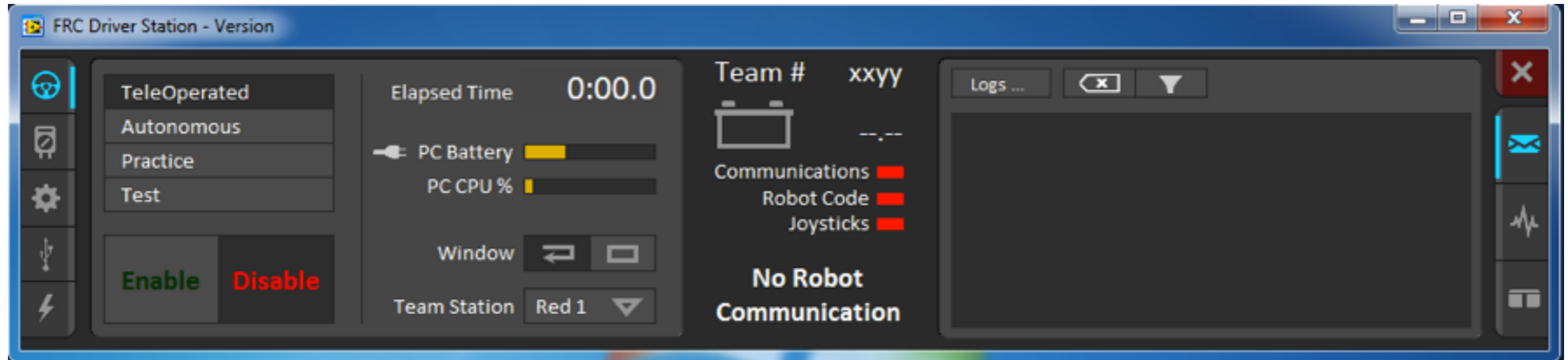
Linux

- Standard linux with real-time extensions
- You can use standard tools like ssh, valgrind, command shells, etc.
- Ability to easily port other tools

Tools

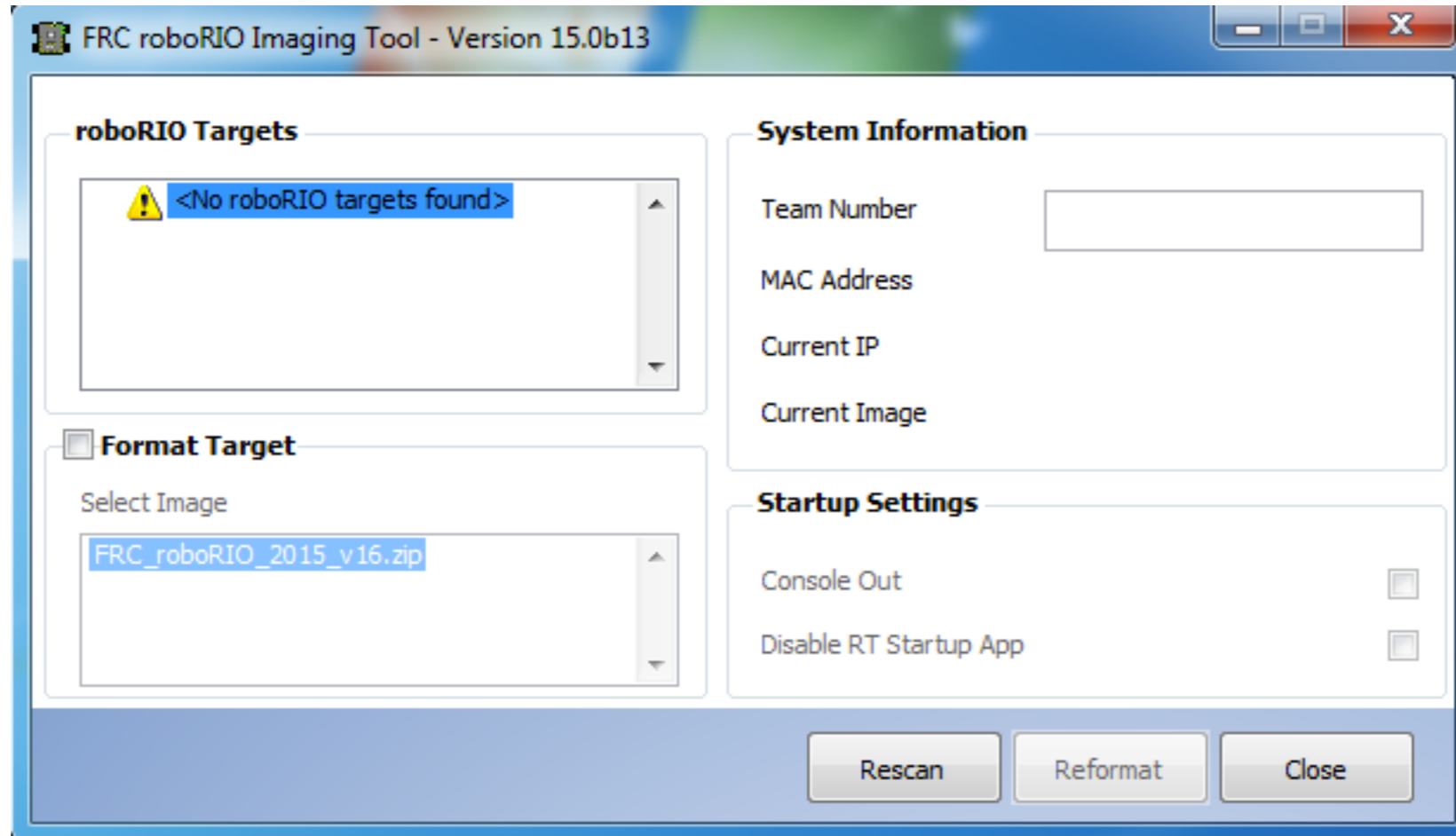
- Web interface for roboRIO
- Dashboards
- New imaging tool
- New Driver Station
- Robot Simulator

Driver Station



- Several new features for 2015
 - Enhanced joystick support
 - Split UI
 - mDNS support

Imaging Tool



New Text-based language IDE

- Both text-based languages use eclipse
- Unified interface for Java and C++
- Off the shelf stock version of eclipse with downloadable plugins
- Templates for project types

Simulation

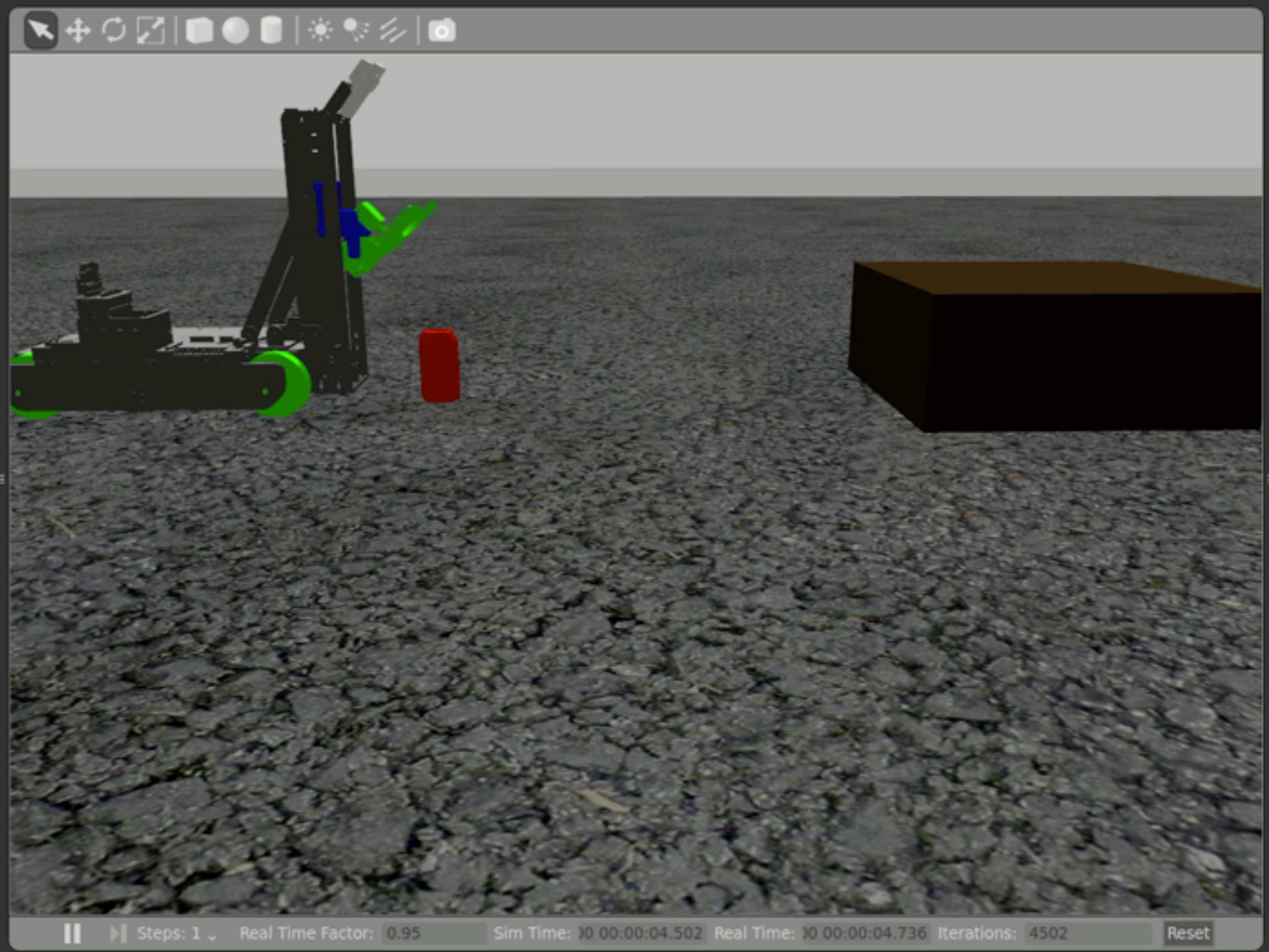
- High fidelity simulation
 - Gazebo robotics simulator
 - WPIlib C++ and Java
 - Currently supplied with sample robots
 - Future: add your own models



World Insert

- Scene
- Physics
- Models
- Lights

Property	Value
----------	-------



Empty joystick
Empty joystick
Empty joystick
Empty joystick

Teleop
 Autonomous
 Test

Enable Refresh Joys...

File View

Gyro -0.017

DT Drill

Elevator ---

Wrist Default

Elevator Top

Elevator Platform

Claw ---

Wrist Horizontal+45

Elevator Halfway

Wrist Horizontal

Close Claw

Turn 90

Open Claw