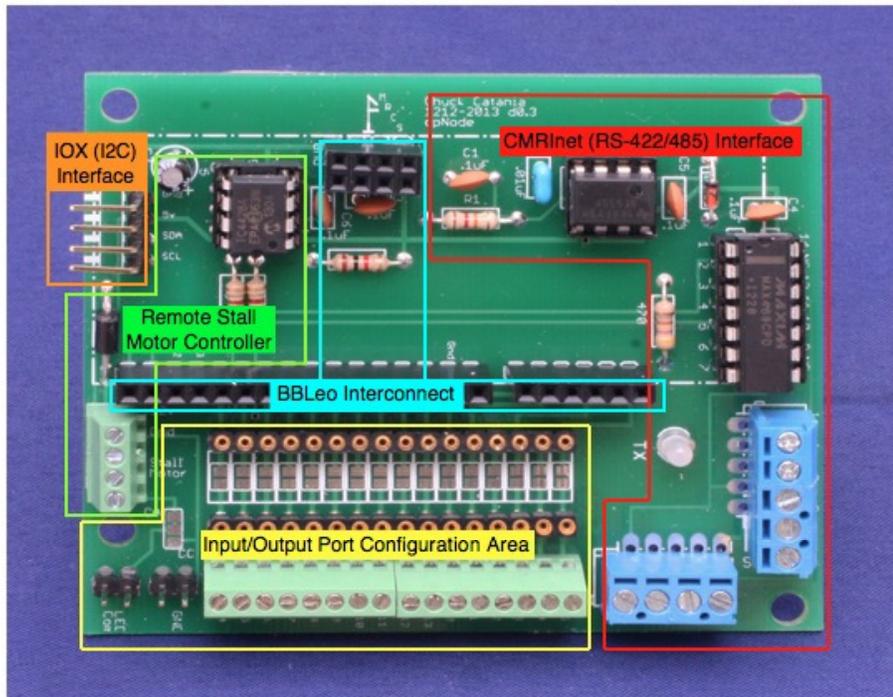# cpNode – An Open Source C/MRI Compliant System
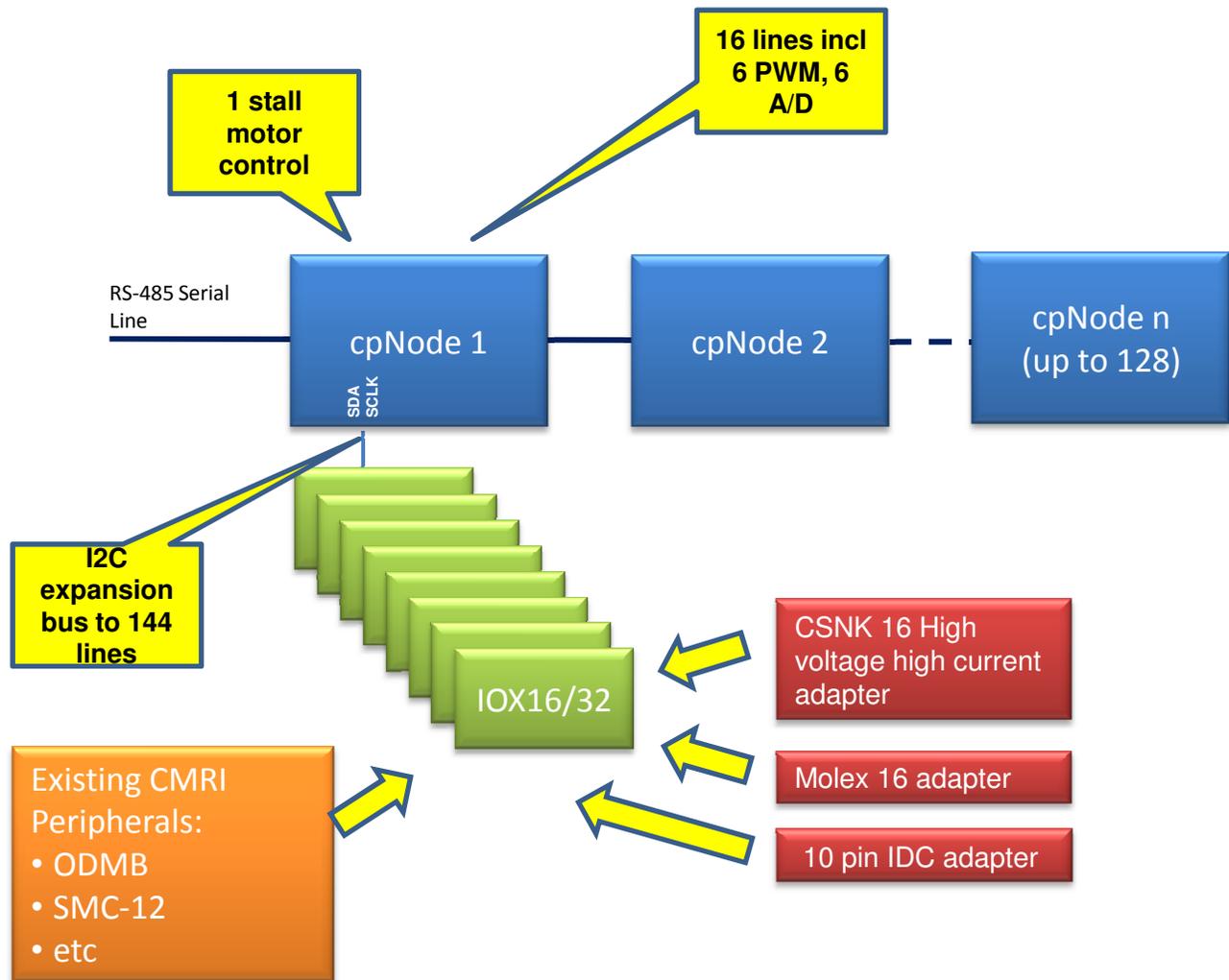# Based on the Arduino Microprocessor Environment

C/MRI is the oldest and one of the most widely used layout control buses, supported by a user community of thousands. C/MRI is a great tool for signaling and automating your layout. CMRINet compatible hardware works with JMRI and with Dr. Chubb's BASIC code.

- cpNodes provide input and output (I/O) ports which connect to LEDs for signals, push buttons, turnout motors, block detectors, and other devices for controlling model railroads.
- Fully JMRI software compatible
- A basic cpNode has:
     - 16 I/O lines with solder pads for LED limiting resistors
     - Screw terminal blocks or headers to connect external devices
     - CMRINet RS-422/485 Network Interface
     - I2C interface for adding Input/Output Expander (IOX) boards for more control ports
     - Stall motor controller
     - Everything needed for one end of a CTC siding, just add signals and detectors
     - Headers to receive a BB-Leo (Arduino) processor
     - I/O is configured in 8 bit groups, providing up to 144 ports for control
- All board designs and software (sketches) are available on the Arduini Yahoo group:
- Download the EagleCAD files and make your own boards or modify the designs to suit your needs
- Bare boards, and assembled and tested boards are available from Model Railroad Control Systems
- Arduino sketches are developed in the free, open source, Arduino Integrated Development Environment (IDE)
- Use cpNodes as small, economical CMRI nodes as is or customize the code to support applications requiring local intelligence.

cpNode Puts Layout Control Where You Need It!

16 lines incl 6 PWM, 6 A/D

1 stall motor control

RS-485 Serial Line

cpNode 1

SDA SCLK

cpNode 2

cpNode n (up to 128)

I2C expansion bus to 144 lines

IOX16/32

CSNK 16 High voltage high current adapter

Molex 16 adapter

10 pin IDC adapter

Existing CMRI Peripherals:
- ODMB
- SMC-12
- etc

cpNode – base adapter with 16 I/O lines
IOX16 – 16 line I/O expander
IOX32 – 32 line I/O expander
ODX 4 – 4 position DCC_OD mother board
CSNK – High Current/Voltage adapter for 16 lines (IOX16)
Molex – 16 line breakout to traditional 0.156 Molex
10 Pin IDC – for Team Digital and RR-CirKits adapters

cpNode by Model Railroad Control Systems - sneumann@pacbell.net