Communication

CAN Bus Wiring
Minimum 28 AWG
Typical 22 AWG

Robot Signal Light
855PB-B12ME522 shown

RSL Wire 18 AWG Typical 22 AWG Minimum

Robot Radio
VH-109

Downstream Power over Ethernet (PoE)

Disabled by default, **Please check DIP Switches 1 and 2 to verify unless you want to have them on.**

If enabled, devices must support PoE at the supply voltage provided to the radio.

Otherwise damage will occur to them.

Radio Power
Minimum 22 AWG

Non-PoE Config Shown
connected to the port labeled AUX 1 or AUX 2. **DIP switch associated with the port must be set to off**

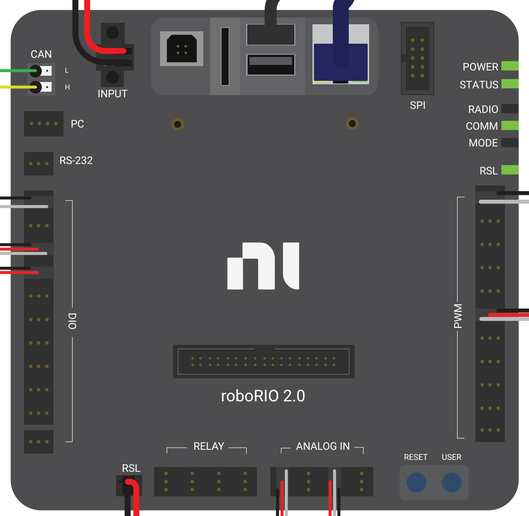
Ethernet Cable

CAN wires should be a twisted pair with a twist per 1 inch or denser.

18 AWG Typical, must be 22 AWG or larger on a 10A Fuse

The main robot CAN loop must start with the RoboRIO.

The use of the discrete I2C/PC port may induce system lockups. Please refer to WPILib docs for possible workarounds.

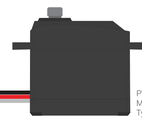


RoboRIO

Check pinout documentation of the specific device you are connecting to the RoboRIO to ensure correct polarity.

USB Camera
C270 Shown

DIO Wiring
Minimum 28 AWG
Typical 22 AWG

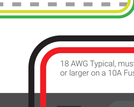


PWM Wiring
Minimum 26 AWG
Typical 22 AWG

Servo
Generic shown

PWM

Limit Switch
Generic Switch shown



IR Break
2168 Sensor shown
Reciever
Transmitter

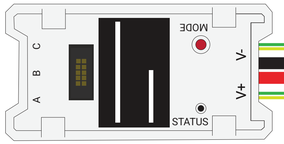
Digital Input/Output

Analog In
Minimum 28 AWG
Typical 22 AWG

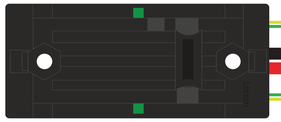
Analog Encoder
TTB-0040 shown

Potentiometer
Generic shown

Analog Input

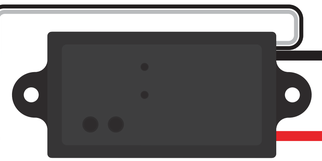


Spark MAX
Brushless/Brushed, CAN/PWM



Talon SRX
Brushed Only, CAN/PWM

Motor and Motor Controller Wires on 31-40A Breakers must be 12 AWG or larger

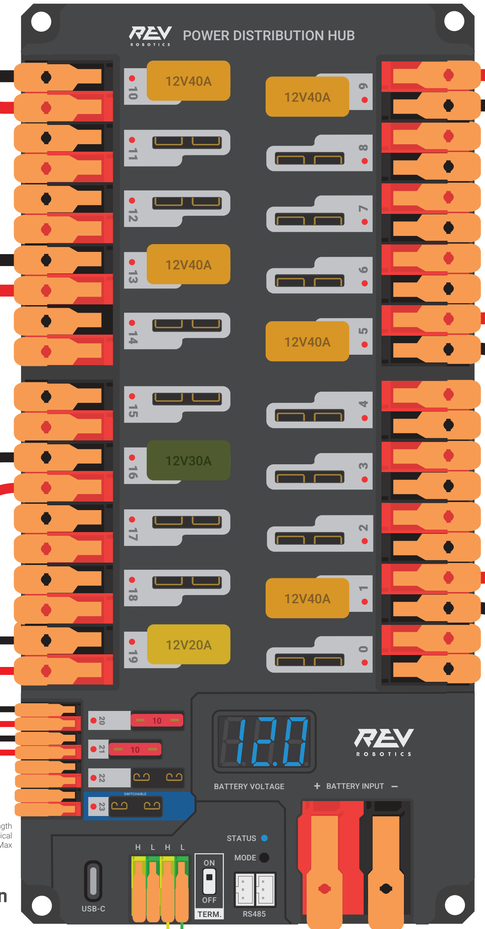


Koors 40
Brushed Only, PWM Only

Motor and Motor Controller Wires on 21-30A Breakers must be 14 AWG or larger

High Current Channel Strip Length
0.5" Typical 0.43" Min 0.51" Max

Discrete Motor Controllers
(CAN/PWM Controlled)

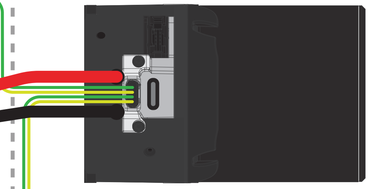


Low Current and CAN Strip Length
0.33" Typical
0.31" Min 0.35" Max

This CAN Bus is configured to end on the PDH (Term Switch ON).

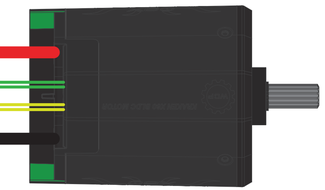
Battery Input Strip Length
0.75" Typical
0.72" Min
0.79" Max

Power Distribution Hub



Neo Vortex (Spark FLEX)
Modular Brushless, CAN/PWM

Kraken X44 (Talon FX)
Integrated Brushless, CAN/PWM



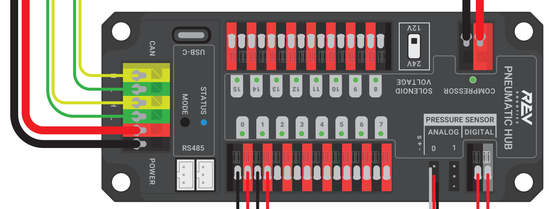
Kraken X60 (Talon FX)
Integrated Brushless, CAN/PWM

Integrated/Modular Motor Controllers
(CAN/PWM Controlled)

PH/PCM power must be 18 AWG or larger if using a 20A breaker

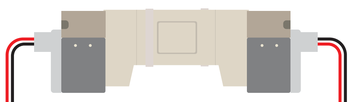
On-board Compressor
Refer to latest Game Manual for specific rules

Compressor wires must be 18 AWG or larger



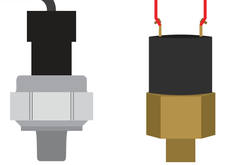
Pneumatic Hub

Push Button WAGO Strip Length
0.35" Typical
0.33" Min 0.37" Max



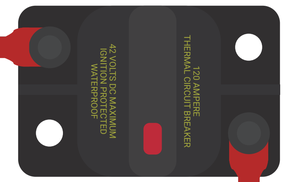
Solenoid Valve
SMC SY3240-6LZ shown

Signal wires must be 28 AWG or larger



Pressure Sensors
Digital (am-2006 shown) or Analog (REV-11-1107 shown)

Pneumatic Systems



120A Breaker
CB285-120 shown

Battery lugs must be crimped and properly insulated.

Battery wires must be 6 AWG or larger

12V Battery
Refer to latest Game Manual for specific rules and examples

Main Power

FRC CONTROL SYSTEM - REV

V.3.30.RV

TEAM 3161

Power
12V DC
Main
LIVE (+) (-) GND

PWM
26 AWG
Minimum
+5V
GND SIG

CAN
28 AWG
Minimum
HI LO

Wires
American Wire Gauge (AWG)
Minimum Gauge per connection type shown.
6 AWG 12 AWG 14 AWG 18 AWG 22 AWG 26 AWG 28 AWG

Always practice proper safety precautions and practices when working with electrical systems.

More Information about the FRC Control System can be found at
https://docs.wpilib.org

KEEP IN MIND