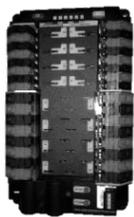




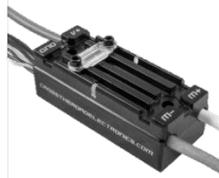
Battery: Provides electricity for the electrical components. The metal contacts on the battery are referred to as terminals or 'leads'.

Circuit Breaker: Connects the battery and PDP and acts as a switch to turn the robot off and on.



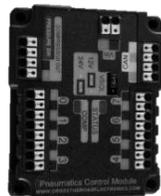
PDP: The power distribution panel distributes electricity to all of the electrical components by drawing energy from the battery.

Speed/motor controller: Controls the speed of the motor it is connected to. FRC 1923 uses the Talon SRX motor controller.



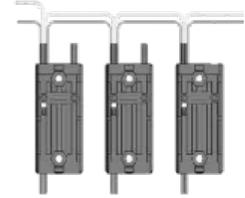
roboRIO: The roboRIO is the 'brain' of the robot and stores all of the robot's code, controlling the amount of power sent from the PDP to other components.

PCM: The pneumatics control module controls pneumatic components, such as the compressor, solenoids, and pressure switch.



VRM: The voltage regulator module regulates the voltage of the electricity that travels to any cameras or sensors on the robot, as well as the radio.

CAN: Information travels on CAN (Controller Area Network) wires between the PDP, roboRIO, Talons, VRM, and PCM.



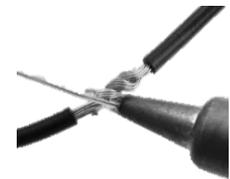
Radio: Puts out a WiFi signal to connect to the driver station laptop, so that the drive team can control the robot.

Wires: Allow electricity to travel to each component on the electrical board. Wires are measured by AWG (American Wire Gauge) according to thickness. As the gauge of the wire increases, its thickness decreases.



10 12 14 16

Soldering: Process of melting solder (lead alloy) to connect separate pieces of wire after their insulation has been stripped.



Crimping: Process of attaching a crimp terminal - connectors - to a wire, such that wires can easily be disconnected at any time.

Anderson connectors: Specific connector that FRC 1923 uses to connect speed controllers to PDP and motors.



Wire Cutters: Used to cut wire, also known as diagonal cutters or usually 'dikes'.



Wire Crimpers: Used to attach crimps to wire after it has been stripped of insulation.



Wire Strippers: Used to remove the insulation off a wire, usually to crimp it, solder it, to connect it to an electrical component.

Electrical tape: Acts as makeshift insulation to cover any exposed wire or leads.



Battery beak: Used to determine how charged a battery is, as well as voltage and quality. Our batteries are fully charged when the beak reads 130%.

If you would like to know more about the FRC control system, visit the following links:

<https://wpilib.screenstepslive.com/s/4485/m/24166/l/144968-2016-frc-control-system-hardware-overview>

<https://wpilib.screenstepslive.com/s/4485/m/24166/l/144971-wiring-the-2016-frc-control-system>

Guiding Questions and Exercises

Robot is to human body as roboRIO is to _____

Which is thicker, 6 gauge wire or 12 gauge wire?

How do the motor controllers get power from the battery?

What is a Talon and what does it do?

You need to connect two wires temporarily but securely. What do you do?

How does the roboRIO send information to the PDP and motor controllers?

You need to get a battery for the robot to use during practice. What should you check?

You see an exposed wire on the electrical board. What should you do?

While prototyping a shooter mechanism for the robot, you see smoke coming from the PDP. What do you do?

Label the following*:

*This image is in no way an accurate representation of an acceptable or complete electrical board.

