

DJ's Suggestions From The Pits

Lansdale Catholic Cyber-Crusaders - FRC 272

by D.J. Wykes

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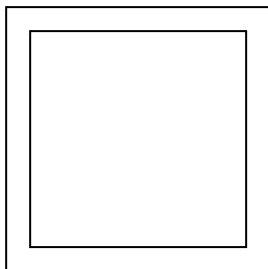
My name is D.J. Wykes and I am a senior at Lansdale Catholic High School, Lansdale PA. I am a member of the Lansdale Catholic Cyber-Crusaders FRC team 272. I have spent my years in robots as part of the electronics group. I have seen a few problems year after year that I will address here. I have a background in electronics because I have to deal with wiring and electronics in racecars that I have raced since the age of 6. I am currently a micro sprint car racer.



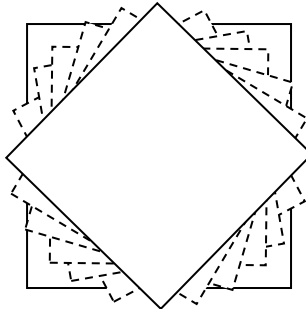
DJ (standing, center) defending turf for the 2008 electronics

Twisted PWM Connectors

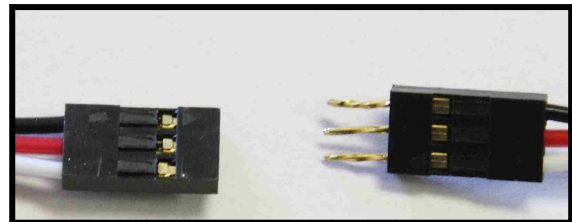
Have PWM cables falling out ever made you want to rip your hair out? They never seem to make a good connection with each other or the component they are connecting to. I have the cure. Take a pair of needle nose pliers to the male connections in your PWM cables and twist them slightly you can ensure a secure connection 100% of the time. By twisting the PWM cable pins, you are taking the largest distance from corner to corner and turning it into a helix or a spiral. This can be imagined by trying to put a diamond into a square. In both pictures below, the outer and inner squares remain a constant size.



Regular Connection



Twisted Pin



This makes for a very good connection. My experience shows they do not come loose at over 90 miles an hour with the engine at full rev. I think they are ok for your FRC project. I would suggest you do not it on your Robot Controller but all your other connections will benefit from this.

Circuit Breaker in your Spike

The other idea came to me at the regional competition in Portland, Oregon in 2007. We went out and suffered a loss because of a popped air pump fuse in the middle of the match. I realized back in the pit that we could prevent this problem with a 'little black circuit breaker' instead of a fuse. I discussed the idea with my team mentor. Together we went to the inspectors and they agreed there was no reason we could not use this arrangement.

The problem is the pump is constantly running due to the fact that it is immediately turned on whenever an actuator is activated. This constant operation results in heat being built in the pump, wires, connectors, SPIKE and finally the fuse. This heat results in the peak of allowed current, which blows the fuse. By placing the simple auto-reset fuse in place of the regular fuse, the wires (main reason for fuses), pump and connectors are given time to cool down as the fuse cools creating a closed circuit again. We also may have used some of the air that helps to lower the pressure in the system. If the breaker goes we will be able to re-start at a lower pressure.

Since that moment it has been the standard on all our robots. With no modifications to the SPIKE relay itself we have allowed ourselves to compete, worry free that we will not have air.

Hope these suggestions help to keep your robot running and your hair on your head...
Good Luck!