



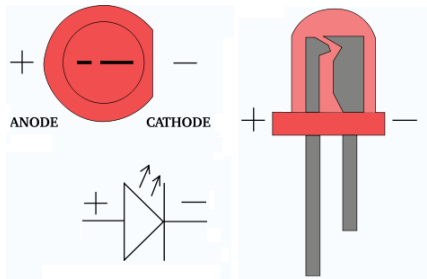
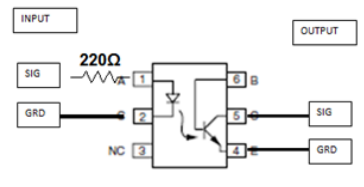
How To: Dual Lynx-VEX Handshake Module

Introduction:

Using the information below, you can make your own dual handshake module very inexpensively. This module will allow you to communicate back and forth from a Lynxmotion robotic arm and VEX components. It will work with other platforms as well, as it is just a simple optical-isolator circuit.

Notes:

A single handshake circuit would look like this, but in the directions below, you can replace the resistor with an LED so that you can tell when an input signal is present.



Keep in mind that the polarity of the LED matters. The shorter leg, and/or the side with a flat, is the negative or cathode side. **This side has to go toward pin 1 of the 4N25, or it will not work.**

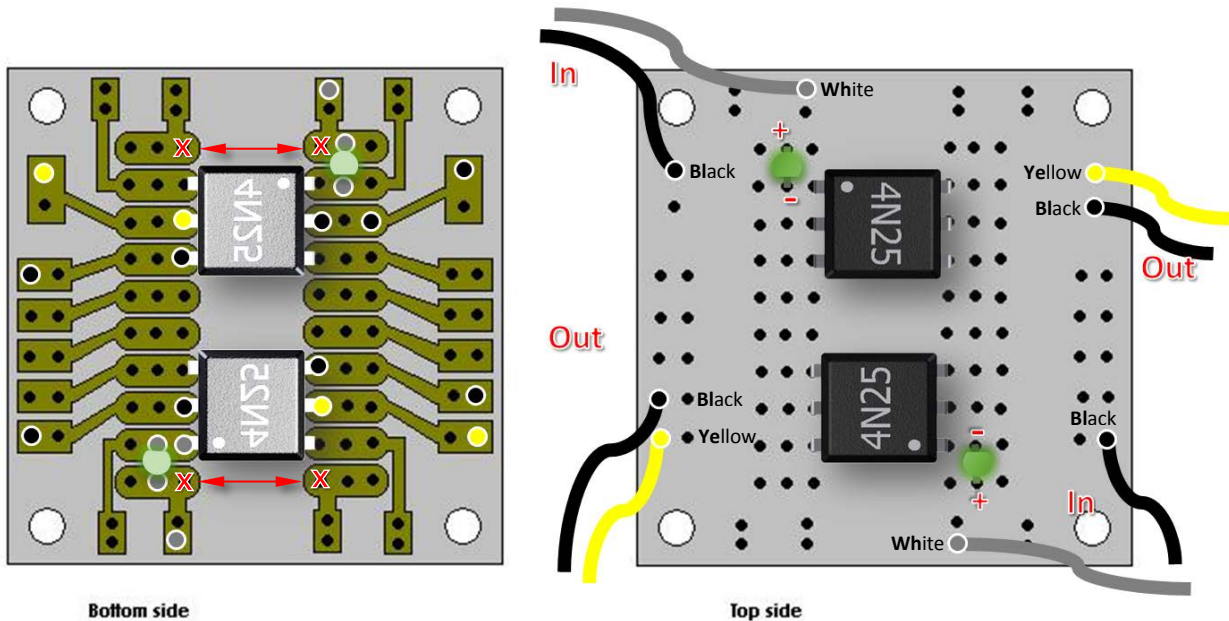
If you decide to use just a 220 ohm resistor then polarity does not matter.

Materials List:

QTY	Part #	Description	Supplier	Cost	Total Cost
1	0302PB12	3.6" x 1.7" General purpose IC board	Electronix Express	\$0.85	\$0.85
2	160-1300-5-ND	4N25 Optical Isolator	Digi-Key Corporation	\$0.35	\$0.70
2	3100	Male Servo Plug	MPI MAXX	\$2.00	\$4.00
2	08L32GD	Green 3mm LED	Electronix Express	\$0.07	\$0.14
1	2701122YL	Hookup Wire: 22 Gauge Stranded Wire: Yellow	Electronix Express	\$1.65	\$1.65
1	270122BK	Hookup Wire: 22 Gauge Stranded Wire: Black	Electronix Express	\$1.65	\$1.65
4	2404FCP	Female Crimp Terminals	Electronix Express	\$0.06	\$0.24
1	2700HS1/8	Black Heat Shrink Tubing 10 ft 1/8	Electronix Express	\$2.95/10ft	\$2.95
1	RB-DFR-113	Male header Pins: 10 Posts	RobotShop	\$3.10 ea	\$3.10

Note: Most of the parts above are cheaper in quantity, so the more you make the cheaper it is. For instance: I always buy extra header pins, as they get lost very easily. Also, you can make your own servo plug and bring the cost down even more. The Servo Plug is called a Male because the other plug it usually mates with on an RC car is a female.

Soldering Diagram



Procedure:

Step 1	Solder IC's in place. Use caution and work quickly as they are heat sensitive.
Step 2	Solder LED's in place observing proper polarity. Use a piece of masking tape to hold it in place while soldering.
Step 3	Cut the black and yellow wires to length. Thread them through the corner holes for strain relief, then solder them to the board.
Step 4	Thread the servo plugs through the corner holes for strain relief, then solder the black and white wires to the board. Cut off the red wire, as it is not used for this application.
Step 5	Crimp and solder the Female terminals to the ends of the Yellow and black wires and add shrink tube.

Finished Product:

The finished product should look something like this. Note the red wires are not connected to anything, and the wires are passed through the corner holes for strain relief.

You can make the wires as long as you wish, and you can also use extension cables to make them longer.

To connect to a VEX Cortex, use male header pins.

