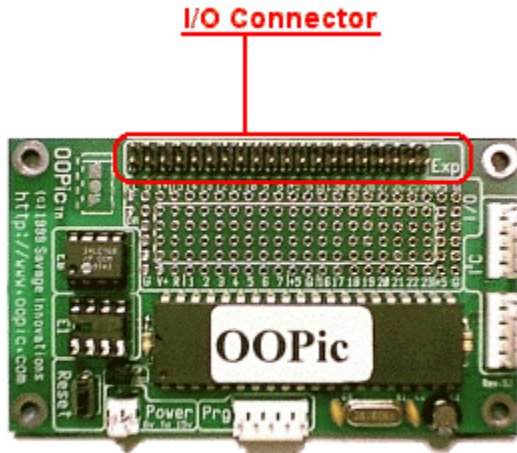


## NewCDBot Programmer Software (NCPS) Sensor Connections

The NewCDBot Programmer Software (NCPS) is a simple program that has been developed to help students, hobbyists, and individuals that are new comers to robotics. The NCPS allows the user to write code for their CDBot without actually writing any code! The NCPS works in conjunction with the OOPic Multi-Language Compiler. Many thanks go to Savage Innovations Inc. for making their OOPic Multi-Language Compiler software readily available and free! For the appropriate wiring connections and pin#'s please refer to the OOPic Online Manual: <http://www.oopic.com/connects.htm>.



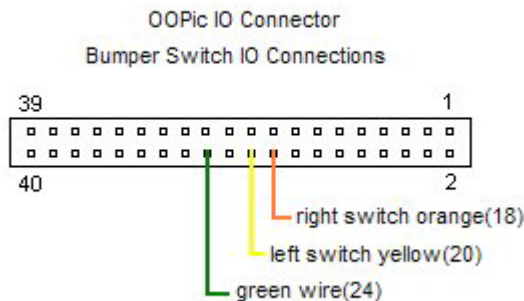
### Sensor Connections:

The NCPS has been setup to work in conjunction with the NewCDBot Robot. For the NCPS to work properly, you must connect the supported sensors to the OOPic I micro-controller on the NewCDBot, but these connections are specific! Within this section I will cover the connection of three different types of sensors that can be interfaced to the NewCDBot. I will first cover the snap switches, IR Obstacle Detection sensors, the Temperature sensor, and finally the light sensing photocell sensor.

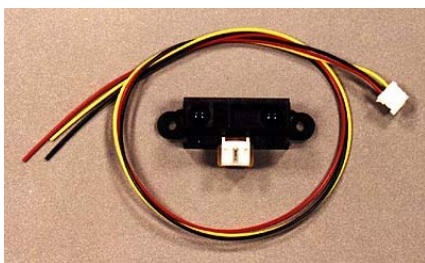


*Bumper Switch*

The snap switch is a sensor that provides tactile feedback to the NewCDBot and allows the robot to perform crude navigation. The NewCDBot can utilize two snap switches. The two snap switches will require a total of three connections to the OOPic controller. The two snap switches will share a common ground wire, which will be either green or black in color. Also, each of the switches will have its own signal wire, which will be orange or yellow in color. The green wire will supply both switches with ground and must be connected to pin#24 on the OOPic I/O connector. The orange wire from the right switch needs to connect to pin#18 and the yellow wire from the left switch connects to pin#20. The orange and yellow wires should connect to the normally open (NO) leg on their respective switch, while the green wire should connect to the common leg of each switch. The switches are setup with an active-low configuration and this means that the internal pull-up resistors on the OOPic must be turned on. If you are programming with the NCPS don't worry about the pull-up resistors, as this will be taken care of by the NCPS. A picture of the snap switch can be found above. This will conclude the section on snap switches. Please refer to the diagram below for the proper bumper switch connections.



The IR Obstacle Detection sensor is capable of providing the NewCDBot with a non-contact means of obstacle detection, which can be used for navigation. The NewCDBot is able to utilize two different types of IR Obstacle Detection sensors. The Sharp GP2D12 and the IRPD-01 from Lynxmotion Incorporated. The GP2D12 has a total of three wires, which have the following functions, red wire (+5V), black wire (ground), and yellow wire (sensor output). Whereas the IRPD-01 has a total of five wires, which have the following functions, red wire (+5V), black wire (ground), blue wire (left LED enable), violet wire (right LED enable), yellow wire (sensor output). Below are pictures of the two different sensors.

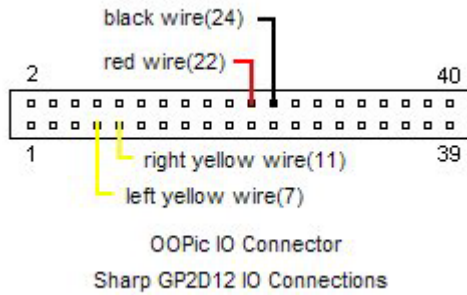


*Sharp GP2D12 Sensor (Left)*

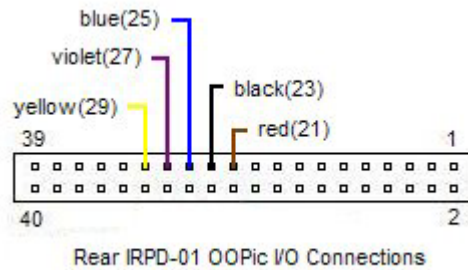
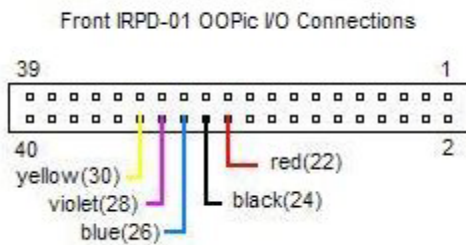


*Lynxmotion IRPD-01 Sensor (Right)*

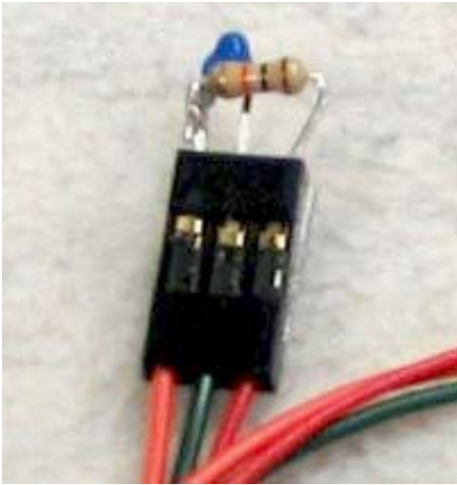
The black wire on the GP2D12 needs to connect to pin#24 on the OOPic and the red wire needs to connect to pin#22 on the OOPic. The Two black and red wires from both GP2D12 sensors have been soldered together. The yellow wire from the left IR sensor must connect to pin#7 and the yellow wire from the right IR sensor goes to pin#9. Please refer to the diagram below for the proper GP2D12 IR sensor connections.



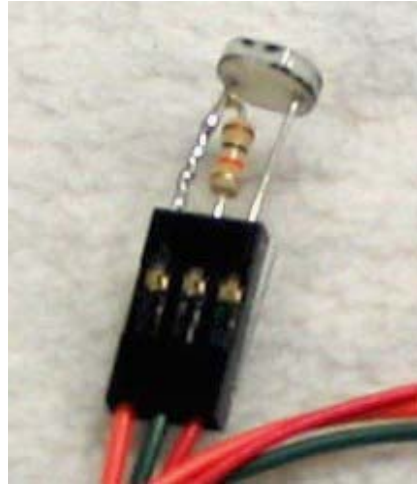
For the front IRPD-01, the black wire needs to connect to pin#24 on the OOPic and the red wire needs to connect to pin#22. The IRPD-01 and the GP2D12 both share then same power connections, so if you wanted to use them both at the same time on the NewCDbot you would have to find a way to connect them together or refer to the OOPic's on-line documentation and find another set of pins to grab power from. The blue wire needs to connect to pin#26, the violet wire goes to pin#28, and the yellow wire goes to pin#30. For the rear IRPD-01 the black wire needs to connect to pin#23 on the OOPic and the red wire needs to connect to pin#21. The blue wire needs to connect to pin#25, the violet wire goes to pin#27, and the yellow wire goes to pin#29. Please refer to the diagrams below for the proper Lynxmotion IRPD sensor connections.



Temperature Sensor & Cable (Left). Photocell Sensor & Cable (Right).

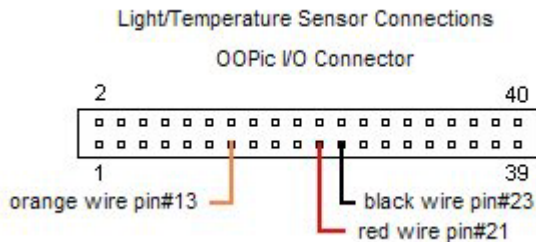


Close-up of Temperature Sensor (Left).



Close-up of Photocell Sensor (Right).

The temperature sensor allows the NewCDBot to measure changes in temperature, while the light sensing photocell sensor allows the NewCDBot to detect varying changes in light intensity. Both sensors share the same cable, so if you have the light sensor installed and want to measure temperature, then you must remove the light sensor and install the temperature sensor. Please refer to the above close-up pictures for the proper installation of each sensor. The light/temperature sensor cable has a total of three connections that need to be made. The red and green wires supply the sensor with +5 volts and the orange wire is the output from the light sensor and corresponds to the amount of light detected. The red wire must connect to pin#21 and the green wire to pin#23 on the OOPic I/O connector. The orange wire connects to pin#13 on the OOPic I/O connector. Please refer to the diagram below for the proper connections.



Please refer to the Online NCPS manual and the NCPS Tutorials for further information. Please send an email to [support@abotics.com](mailto:support@abotics.com) if you have any questions or difficulties.