RoboMicro SRF08 Connection

RoboMicro: Connecting To SRF08 Module

Description

This document will help you to connect an SRF08 Ultra Sonic Range Finder to RoboMicro; it also shows the instruction sequence to allow RoboMicro to control the SRF08.

The idea of using RoboMicro to control/command the SRF08 modules is that all the “hard-work” of driving the SRF08 is done for you.

When RoboMicro has been correctly configured, the user may disconnect and reconnect the SRF08 modules without disabling the I2C driver first. The I2C driver will adjust to missing/re-connected SRF08 modules automatically.

Connection Overview

The SRF08 Ultra Sonic Range Finder Module uses an I2C bus to communicate with the outside world. RoboMicro has an I2C bus built in, as well as firmware driver to allow RoboMicro to control & configure an SRF08 Module.

The firmware driver can control up to 16 SRF08 modules connected to the RoboMicro “Sensor Net”. The “Sensor-Net” is a convenient way of describing the way 16 SRF08 sensors are connected and controlled by RoboMicro. (For more information on I2C and addressing, please refer to the I2C Bus standard).

A small PCB is available which allows an SRF08 sensor to be mounted and connected into the RoboMicro “Sensor-Net”.

RoboMicro I2C Bus

RoboMicro will always be the I2C Bus Master, and comes with the required “pull-up” resistors on the I2C bus SDA & SCL lines. There is no need to apply any additional bus termination, unless the length of the bus becomes excessive.

The RoboMicro I2C bus can be routed round a Robot chassis without any problems. It is best to keep the I2C bus away from High-Power/High-Current wires (motor wires, etc) – due to noise and other inference causing errors on the I2C bus.

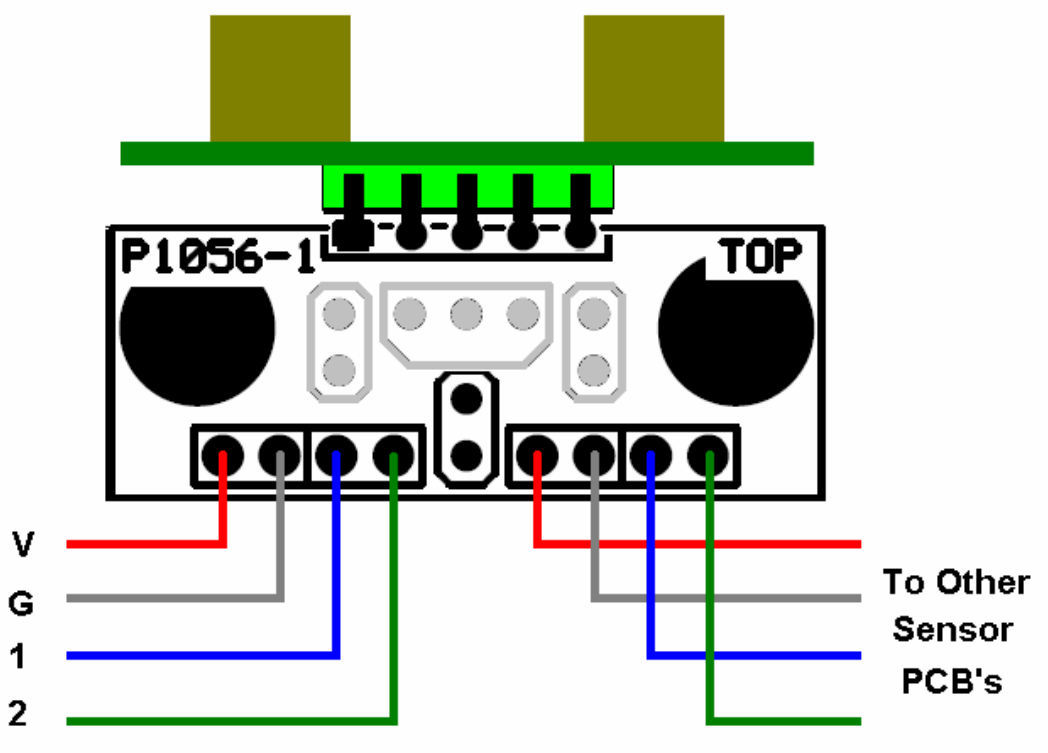
Sensor PCB Connections (With SRF08 Fitted)

This drawing shows the connection details when using the small RoboSensor PCB.

- **V (Sensor Supply) is connected to V of the Digital Input Connector on RoboMicro**
- **G (Signal Ground) is connected to G of the Digital Input Connector on RoboMicro**
- **1 (Digital Input 1) is connected to 1 of the Digital Input Connector on RoboMicro**
- **2 (Digital Input 2) is connected to 2 of the Digital Input Connector on RoboMicro**

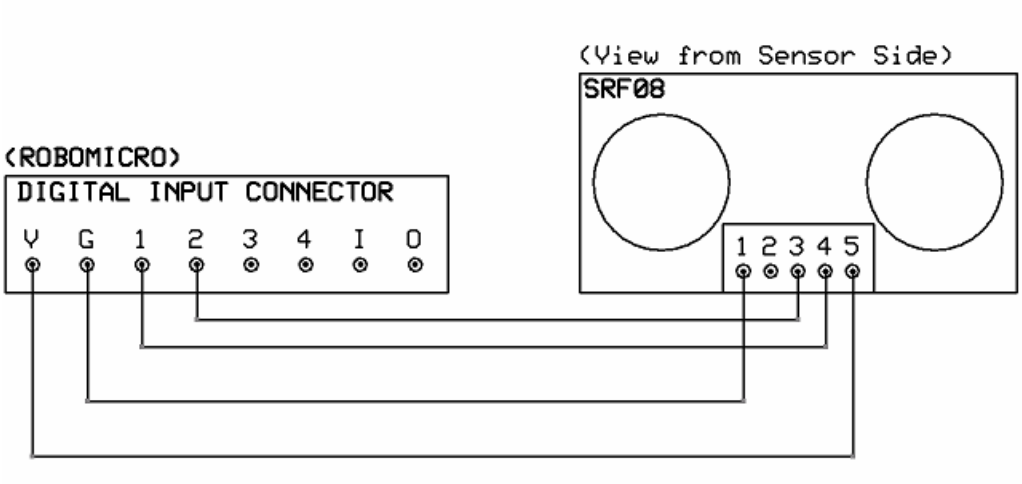
The RoboSensor PCB allows multiple PCB's to be "Daisy-Chained" together.

(View from Top)



SRF08 Connections Direct To RoboMicro

This drawing shows the connection details when using a single SRF08 Range Sensor Module.



RoboMicro Configuration & Commands

To allow RoboMicro to control an SRF08, the following sequence of event needs to take place.

- Enable I2C Bus Driver in RoboMicro. This command need only be done once, as it enabled/disabled state of the driver is stored in E2prom and re-read on power-up.
- Connect RoboMicro I2C Bus to SRF08, using either of the two methods detailed in this document.
- "Mount" the SRF08 into the Sensor-Net: This basically means that the I2C sensor address is changed to one of the Sensor-Net I2C addresses. This allows up to 16 SRF08 sensors to be connected into the Sensor-Net – with each sensor having a unique ID (0x00 to 0x15).

Basic Configuration of RoboMicro & SRF08 Module is now complete. The User need now only send a "Ping" command to get RoboMicro to Ping one of the SRF08 sensors.

"Ping-All" Sensors Command: This causes RoboMicro to command all connected SRF08 sensors to take a range sensor measurement.

"Ping One" Sensor Command: This causes RoboMicro to command one of the SRF08 sensors to take a range sensor measurement. This command will cause RoboMicro to report back automatically the new range measured by the SRF08 module.

Example I2C Bus Enable Command
This example shows the user enabling/starting the I2C Driver in RoboMicro

- User Sends "**(SSI2C)**" to RoboMicro
- RoboMicro will respond with "**(ACK)**" if I2C bus driver has been enabled and is running correctly. If the I2C driver has not been enabled, RoboMicro will respond with a "**(NAK)**".

Example SRF08 Sensor Mount Command.
This example mounts an SRF08 module to Sensor-Net location ID1.

- User Sends "**(SSUM01)**" to RoboMicro
- RoboMicro will respond with "**(ACK)**" if the Sensor has been correctly mounted into the Sensor-Net location. If the I2C driver has not been enabled, RoboMicro will respond with a "**(NAK)**".

Example Command to "Ping All" Sensors
This command causes RoboMicro to get all the SRF08 sensor connected to take range measurement.

- User Sends "**(WUP)**" to RoboMicro
- RoboMicro will respond with "**(ACK)**" if the command has been accepted & processed. If the I2C driver has not been enabled, RoboMicro will respond with a "**(NAK)**".

Example "Ping One" Command
This command causes RoboMicro to get one SRF08 sensor to take a range measurement and report back this new range measurement to the user.

- User Sends "**(WUS1)**"
- RoboMicro will respond with "**(RUS0100053)**" if the command has been accepted & processed.