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PING))) Kit for Stingray (#28985)

This kit gives the Stingray Robot the ability to sense its surroundings while in operation; with the addition of these modules, the Stingray can actively maneuver, avoid, or find objects that could not previously detected. The 3 PING))) sensors are attached to the front of the Stingray mounting panels giving it a wide field of view; with various mounting holes you can customize or install the modules in a manor which best suits the needs of the robot.

Features

- PING))) Ultrasonic Range Finders
- 3-pin extension cables for easy connections
- Nylon spacers to ensure proper installation on the chassis
- Ultrasonic vision for the Stingray Robot for up to 9 meters
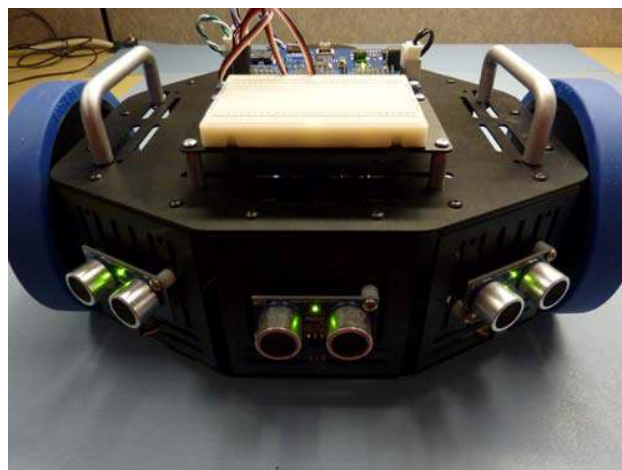
Key Specifications

- Power requirements: ~60mA @ 5 VDC (~20mA each PING))) sensor)
- Communication: Positive TTL Pulse
- Operating temperature: +32 to +158 °F (0 to +70 °C)

Application Ideas

- Ultrasonic vision for a robot
- Robotic distance detector

Bill of Materials

Part #	Description	Quantity
28015	PING))) Ultrasonic Range Finder	3
700-00003	4/40 Zinc Plated Nut	6
710-00006	4/40 ½" Zinc Phillips Pan-head Screw	6
713-00015	3/16", #8 Plastic Spacer	6
805-00001	10" Lead free extension cable	3
700-00015	Nylon washers, # 4	6
700-00025	Rubber Grommet 13/32"	3

Assembly Instructions

Step 1: Part Verification

Unpack everything from the packages and make sure you have all the parts and that you have the tools listed below.

- 1 – Built-up Stingray Robot
- 3 – PING))) Ultrasonic Range Sensors
- 6 – 4/40 Zinc nuts
- 6 – 4/40 1/2" zinc pan head screws
- 6 – 3/16" #8 Plastic Spacers
- 3 – 10" Extension cable
- 6 – Nylon Washer #4
- 3 – Rubber Grommet
- 1 – Parallax screw driver *
- 1 – 1/16" Hex Key *

*Note: Tools indicated with a * are provided in the Stingray Robot Kit and not included in the PING))) Kit.*

Step 2: Disassemble

Using the 1/16" Hex key that came with the Stingray Robot kit; start by unscrewing the front sensor mount plates, hereafter referred to as plates or plate.

Each plate will have 4 screws connecting to the chassis, two on top and two on bottom. Once removed, keep these screws in a secure place.

Once all 3 plates are out, you should have a total of 12 screws as well as 3 lose front plates.
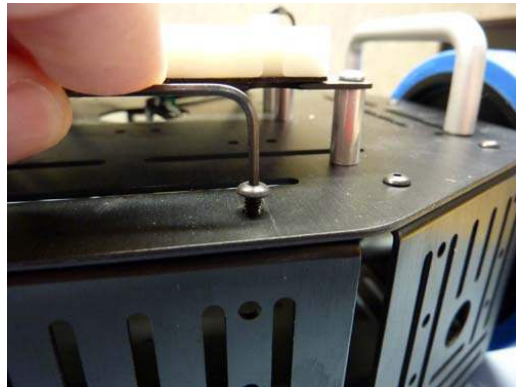
Step 3: Connecting Cable

Connect a10" extension cables to the PING))) sensor. The pins on the module should be connected to the cable as followed:

**Black connects to GND
Red connect to 5V
White connects to SIG**

Place a rubber grommet in the circular area of plate and insert the connection cable through the grommet.

If in step 4 you chose to install the PING))) in a different orientation, it is suggested that the grommet be still used to protect the cable from getting damaged.
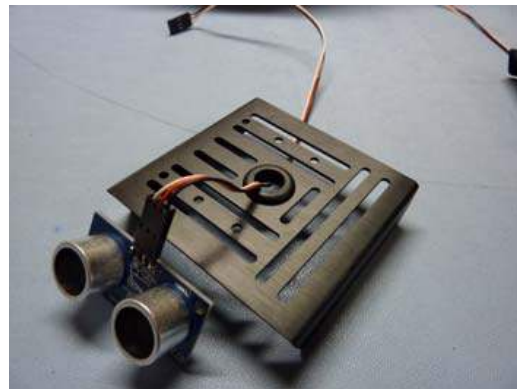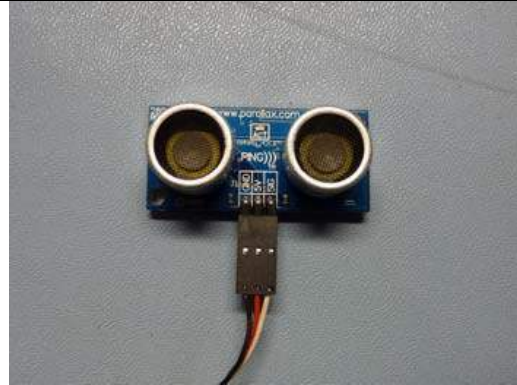
Step 4: PING))) Sensor Assembly

Place the nylon spacers as pictured to align the PING))) sensor. It is possible to install the sensors in various places on the plate, the middle was chosen for versatility; however if the PING))) sensors are installed to close to a surface, they are likely to encounter false echoes.
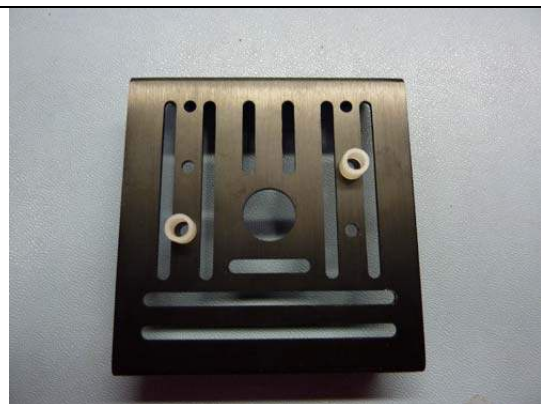
Using a screw, nylon washer, and hex nut; connect the PING))) module to the plate. Do not tighten the screws all the way until you have adjusted the PING))) to make sure it is being installed straight.
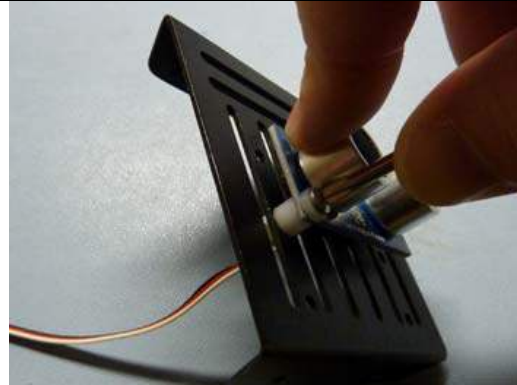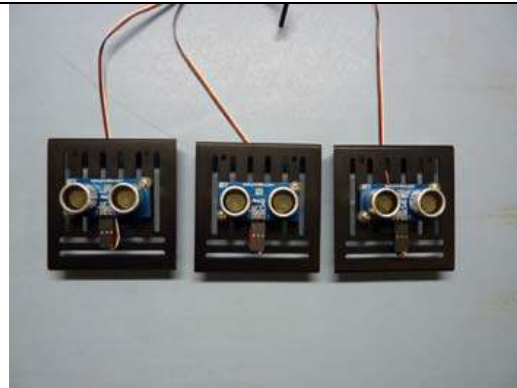

Once you have installed the PING))) module, the plate should look similar to the one pictured.
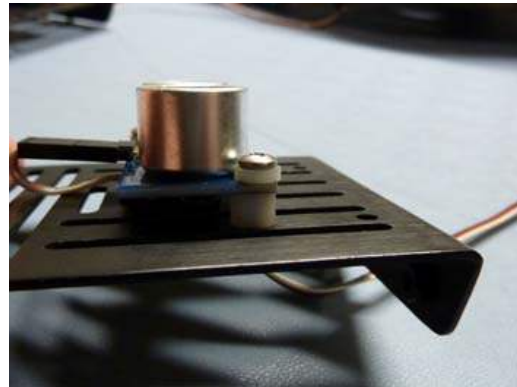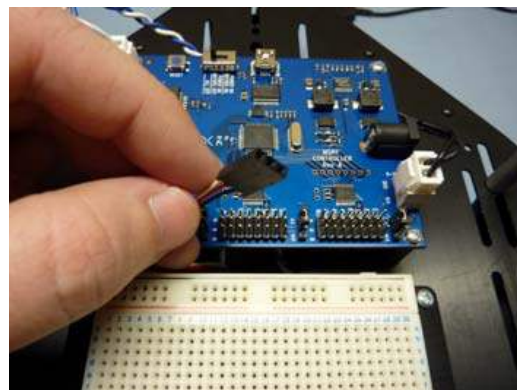

Step 5: Repeat (x2)

Once you have completed the first plate, use the previous step to build the other two plates. When you are finished with this step, you should have 3 sensor mount plates that look similar to those pictured.
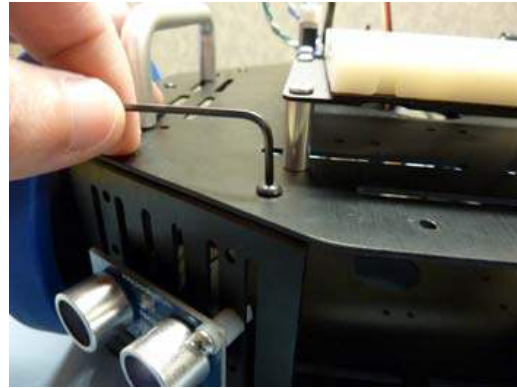

Step 6: Sensor Mount Plate Re-Assembly

You can use the circular cutout on the top of the Stingray to route the cables to connect to the I/O pins.

Note: Remember which PING))) uses which cable; the white wire of the cable will connect to an I/O pin in step 8.

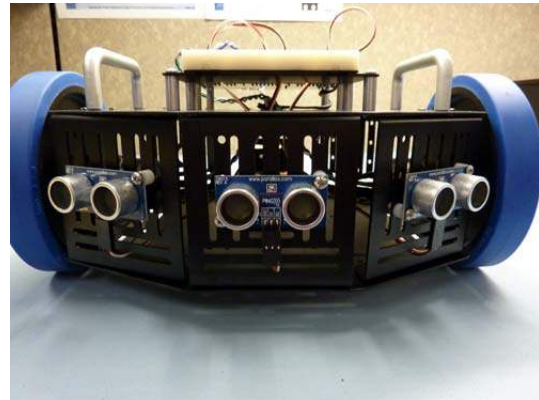|	
Using the same screws from step 2, connect plate back on the Stingray. *Note: When connecting the plate, do not tighten the screws until all 4 are in; this will installing the sensors straight easier.*	
Step 7: Repeat (x2) Connect the other two plates in the same manner as the first. Once completed, you should have no extra screws and the robot should look similar to this example.	
Step 8: Connecting PING))) to I/O With the Stingray oriented so that the PING))) modules are facing away from you; the numbering goes as followed: **Left PING))) to I/O pin 0** **Center PING))) to I/O pin 1** **Right PING))) to I/O pin 2**	
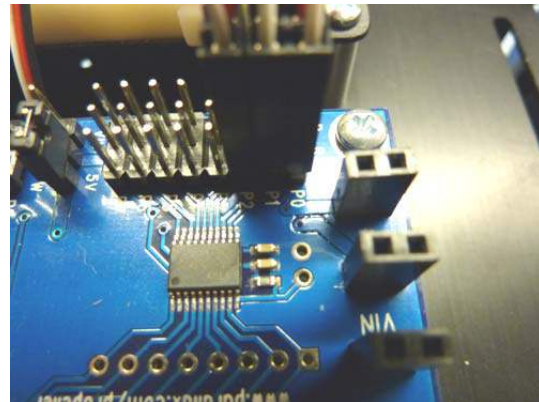
Step 9: Download Samples

Download *PING)))s on a Stingray robot - Archive (.zip)* from the Downloads and Resources area on the product page, item code #28985.

Save all 3 files. Once the zip is extracted to a folder, open Stingray Demo.spin; this is the top level program leaving PING))).spin and PWMx8.spin as the object files.
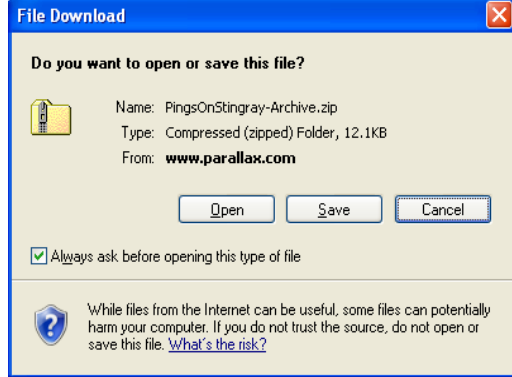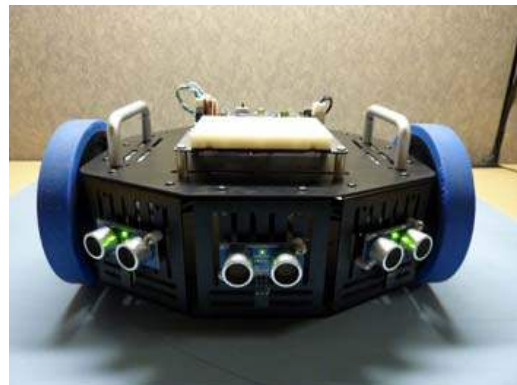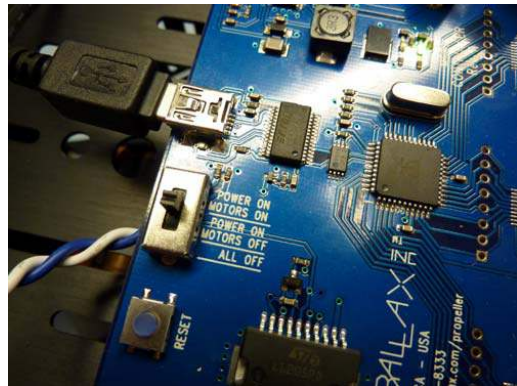

Step 10: Turn On & Run Program

Turn the Stingray power switch to POWER ON/MOTORS OFF.

Download the top level program (Stingray Demo.spin) to the Propeller by pressing F11 or selecting run => compile current => Load EEPROM.

The Stingray is ready to roam.

Resources and Downloads

[Stingray Robot Documentation v1.1](#) (.pdf)
[PING))) on a Stingray robot - Archive](#) (.zip)

Device Information

Theory of Operation

The demo program displays how the Stingray can avoid obstacles using the ultrasonic sensors. The Stingray can maintain a course of forward progress and can be programmed to perform a various number of other tasks while still keeping the proper distance; if stuck in a corner or similar type obstruction then the Stingray will spin while finding the best option. Once you have verified that everything works and is functional; continue and enjoy creating your custom applications.

Precautions

- Do not rely solely on the PING))) sensors to see an object to halt operation; if you feel there is any way of possible damage to either the robot or bodies, please exercise extreme caution while using the Stingray Robot. If you have any questions, feel free to contact technical support to get any questions answered.