

ROBO-TANK

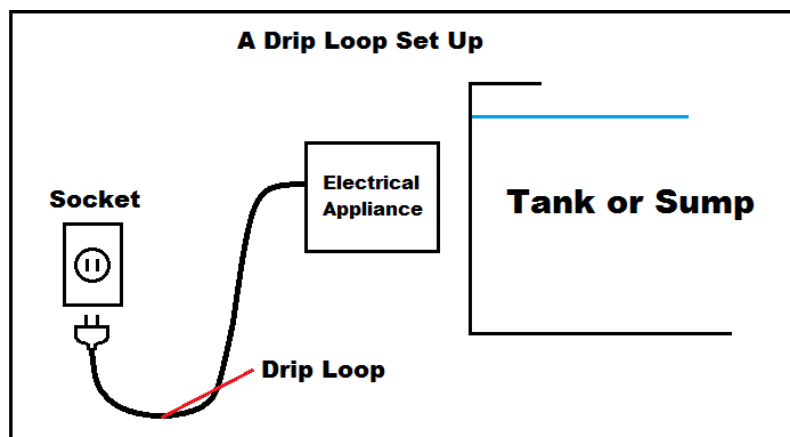
Aquarium Controller

Sensor Extension Wiring Diagrams



Safety Reminder

- **READ & FOLLOW ALL SAFETY INSTRUCTIONS**
- **DANGER**
 - Never handle electrical equipment with wet hands
 - special care should be taken since water is employed in the use of aquarium equipment
 - Do not attempt repairs to commercial equipment yourself, return to place of purchase or the manufacturer's authorized service facility
- Ensure all components (power adapters, power boards, controllers, wires, etc.) are properly set up according to manufacturer's recommendations, to prevent accidental damage
- If an appliance shows any signs of abnormal water leakage, immediately unplug it from its power source
- If an appliance falls into the water, **DO NOT** reach for it, first unplug it from its source of power
- Carefully examine the appliance(s) after installation. It should **NOT** be plugged in, if there is any sign of water on parts not intended to be wet.
- Do not operate any appliance if it has a damaged cord or plug, or it is malfunctioning or has been dropped or damaged in any manner
- Avoid the possibility of the appliance plug or receptacle getting wet, position the aquarium stand and tank or sump, to one side of a wall-mounted socket or power board, to prevent water from dripping onto the socket, plug or power board
- A "drip loop", shown in the diagram below, should be set up by the user, for each electrical cord connected to an aquarium appliance to a socket. The "drip loop" is that part of the electrical cord below the level of the socket, or the connector of an extension lead, if used, and the socket or power board, to prevent water travelling along the cord and coming in contact with the socket.



- If the plug, socket or power board does get wet, **DON'T** unplug the cord. Disconnect the fuse or circuit breaker that supplies power to the appliance, then, and **ONLY** then unplug the appliance and examine the socket or power board for the presence of water
- Always unplug an appliance from the outlet, when not in use, before putting on or taking off parts, and before cleaning
- Never yank the cord to pull plug from outlet, grasp the plug firmly to remove
- Read and observe all important notices on the appliance
- If an extension cord is necessary, a cord with the proper rating should be used. Care should be taken to arrange cords, such that they are not a trip hazard
- Indoor use **ONLY**
- For Calcium reactor operation, refer to the manufacturer's instructions, as per it's manual
- For Robo-Tank operation, refer to the operating instructions, as per it's manual
- Keep controller cool and dry, do not expose to direct sunlight or heat

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1. Sensor Module Ports

The sensor module has 6 sensor ports with individual sockets for optical sensors, non-contact sensors and miscellaneous sensors such as a DS18B20, DHT22 or other Arduino based sensors. Each port has a convenient jumper at the bottom to select which plug type to use.



The port names above are blue in the section titles below for cross reference.

2. Optical Sensor Ports 1 – 6

The top row of ports are for optical sensors, to enable this port you set the corresponding pluggable jumper to the **Opt** side shown in the image below.



It's important you don't plug an optical sensor in a non-contact sensor port otherwise it WILL BE PERMANENTLY DAMAGED!



Outlet	GPIO	Driver
Sensor Port 1	14	Raspberry Pi
Sensor Port 2	15	Raspberry Pi
Sensor Port 3	17	Raspberry Pi
Sensor Port 4	18	Raspberry Pi
Sensor Port 5	27	Raspberry Pi
Sensor Port 6	23	Raspberry Pi

The following list is the pin number and driver to set up the Port

3. Non-Contact Sensor Ports 1 – 6

The second row of ports are for non-contact sensors, to enable this port you set the corresponding pluggable jumper to the **NC** side shown in the image below.



Outlet	GPIO	Driver
Sensor Port 1	14	Raspberry Pi
Sensor Port 2	15	Raspberry Pi
Sensor Port 3	17	Raspberry Pi
Sensor Port 4	18	Raspberry Pi
Sensor Port 5	27	Raspberry Pi
Sensor Port 6	23	Raspberry Pi

The following list is the pin number and driver to set up the Port

4. Miscellaneous Sensor Ports 1 – 6

The third row of ports are for miscellaneous sensors such as float switches, DS18B20 temperature sensors, DHT22 temp/humidity sensors or many other Arduino compatible sensors. To enable this port you set the corresponding pluggable jumper to the **Sensor** side shown in the image below.

The jumper above the sensor port marked PD and PU sets the resistor for the port to either a pulldown or pullup type resistor. Most sensors typically use a pullup type. Having this set to the wrong side won't ruin anything, it just won't work.



Outlet	GPIO	Driver
Sensor Port 1	14	Raspberry Pi
Sensor Port 2	15	Raspberry Pi
Sensor Port 3	17	Raspberry Pi
Sensor Port 4	18	Raspberry Pi
Sensor Port 5	27	Raspberry Pi
Sensor Port 6	23	Raspberry Pi

The following list is the pin number and driver to set up the Port

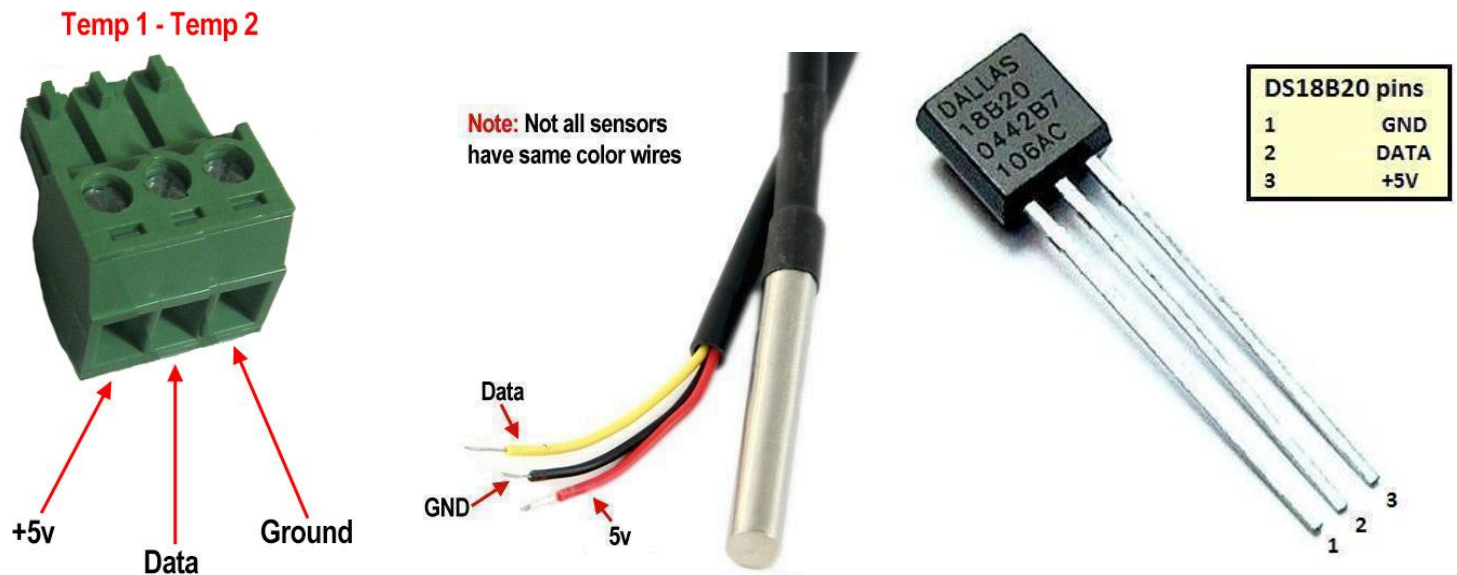
5. Connecting a DS18B20 Temperature Sensor

If you connect a DS18B20 sensor to one or more of the ports you need to edit the `/boot/config.txt` file on the Raspberry Pi. Below are the steps to do this.

1. Run the following command in your Raspberry Pi terminal window.
`sudo nano /boot/config.txt`
2. Once the text editor loads the file, scroll down and locate the following line.
`dtoverlay=w1-gpio`
3. Delete this line and replace it with the following line if you haven't already.
`dtoverlay=w1-gpio,gpiopin=4`
4. Now add a line like the one below for each port you use, replace the 22 at the end with the correct pin number from the table below.
`dtoverlay=w1-gpio,gpiopin=14`
5. Now press **CTRL + S** on your keyboard to save the file and then press **CTRL + X** to exit.
6. Unplug power from the controller, wait a few seconds and power back up.

Outlet	GPIO
Sensor Port 1	14
Sensor Port 2	15
Sensor Port 3	17
Sensor Port 4	18
Sensor Port 5	27
Sensor Port 6	23

Note: You can connect multiple sensors to the same port however if one fails the other will be affected. The limiting factor is the overall length of cable, if you add an extra sensor and it stops reading the others try shortening the cable.



6. Connecting a Float Switch

You can connect a float switch using the green universal connector.

- Set the jumper above the green connector to “PD” side
- Set the jumper below the green connector to “Sensor” side
- Now connect your float switch to the connector like the image below, use the **+5v** and **Data** pin



Float Switch



Polarity doesn't matter



7. Connecting a Flow Meter

You can connect a flow meter using the green universal connector.

- You don't need a jumper on the top set of header pins
- Set the jumper below the green connector to "Sensor" side
- Now connect your flow meter to the connector like the image below.



Thank-you again for your purchase and I hope you enjoy your Robo-Tank controller.

Questions or comments contact me, Rob Fowler at info@robo-tank.ca

Last Updated October 17, 2022