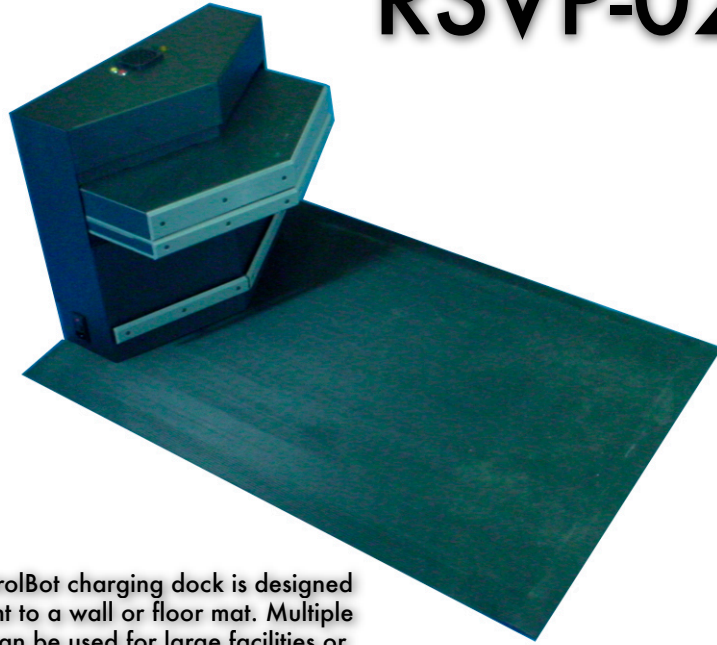


Charger

INSTALLATION INSTRUCTIONS

RSVP-024



The PatrolBot charging dock is designed to mount to a wall or floor mat. Multiple docks can be used for large facilities or more than one robot.

Charging Dock for PatrolBot™, RoboSentry™, and SpeciMinder™ Robots

Automatic charging is necessary for fully autonomous operation.

In order for a robot to claim full autonomy, it must be able to recharge itself without human intervention. The charging dock allows any PatrolBot, RoboSentry, SpeciMinder, or compatible robot to perform automatic recharging when necessary. Specifically designed to maintain the batteries in top condition, the charging dock provides bulk and float charging. A standard 110 Vac outlet is all that is required to install the dock. The robot controls the start of the charging cycle as well as determining the bulk or float current limit.

Specifications

- 110 Vac Standard Power
- 25 - 29 Vdc
- 5a Max Bulk Charging Current
- 19" wide x 18" high x 14" deep
- Wall mounting brackets (optional)
- Floor mat mounting bracket (optional)
- Manual Override
- AC Power Indicator
- Charging Cycle Indicator
- Replaceable Charging Plates
- Metal enclosure
- 2 cooling fans
- Plastic Bumpers
- Modular AC Power cord

Instructions:

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The robot needs a "final approach" to the dock approximately 4 feet from the dock clear of obstacles.



The final approach

In order to ensure reliable and repeatable auto-docking the robot goes to a goal about 4 feet directly in front of the dock assembly to set up its "final approach". The robot should be on the same surface as the dock assembly (floor or mat). If the dock is mounted to a thin mat (less than 1/2 inch thick) the goal can be on the floor rather than on the mat. If the mat is thicker, it is best to have the goal on the mat so that all of the robot's wheels are on the mat before making its docking run. If the dock is mounted to the wall, it should be resting on the floor and level. Proper alignment is necessary for reliable operation.



They are revealed when the robot pushes forward into the assembly. Once fully inserted, the robot commands the dock to start the charging cycle. The robot has 2, 12 Vdc 18 ah batteries which accept a bulk charge of about 5 amps and a continuous float (trickle) charge. The cycle is automatically controlled depending on the state of the battery. Normally, the robot will find, approach and start the charger automatically, however, there are manual controls on the dock to start and stop the cycle. Also, a green light indicates that AC power is on. There is an on/off switch near the bottom of the left side (next to the power cord). The yellow light on the top of the dock indicates the charging cycle is in progress.

It is important to make sure the robot and dock are aligned and easily slides into and out of the dock. An unobstructed area is best but the robot can maneuver in tight quarters if necessary. Minimum clearances are adjustable but 15 inches on either side is a typical clearance. A typical rear clearance is 24 inches. Moveable objects such as chairs, carts, and containers should be kept clear of the area.

Charging Plates and Contacts

The robot and the dock both have charging contacts which conduct the bulk and float current at 24 to 29.5 Vdc. The plates on the charger are on the bottom (stationary) plate.

Desired layout:

Make sure there is enough room for an unobstructed final approach

1. Final Approach

Although tighter restrictions are possible, best results are obtained by providing at least 4 feet of clearance.

2. Side Clearance

As long as the robot can turn and face the dock, a minimum of 6 inches of side clearance is manageable.

3. Rear Clearance

The robot needs to back away from the dock so that the charging contacts are well clear before turning.

4. Transient Objects

People, chairs, carts should be kept away from the final approach. The robot will do its best to navigate around obstructions to get to the dock.

5. Manual Controls

Automatic charging is handled by the robot but manual controls are available. If the robot needs to be powered off for an extended period, it is best to leave it in the charger. Starting and stopping the charge cycle is accomplished with momentary pushbuttons on the top of the dock.

Battery Maintenance

Even with high frequency of charging cycles, the two, SLA 12v 18a.h. batteries will last 6 months to one year. The robot will manage its power requirements and properly maintain the batteries.





Wall Mounting Brackets



Cut the baseboard trim or add shims for flush mounting

Wall Mounting:

Permanent attachment to wall

1. Pick a suitable location for the dock
Make sure the robot can reach the final approach to the dock. This is a goal approximately 4 feet in front of the charging contacts.

2. Attach the wall mounting brackets
6 hex head countersink screws are included. Attach 3 screws per bracket with included hex wrench.

3. Mark the wall for anchor location
After the brackets are attached, mark the location of the wall anchors. If mounting to dry wall, use dry wall anchors. No need to hit the studs. Just keep the dock from moving and level.

4. Add shims or cut baseboard trim
Before final mounting, make sure brackets are flush with wall by cutting the baseboard trim. Otherwise, add shims between brackets and wall. Make sure top plate of the dock is level to ensure proper alignment with robot.

5. Attach brackets to wall anchors
The power cord is on the left side so if the outlet is on the right, run the cord OVER the dock against the wall. Do not run under the dock.

Standard Outlet

No special power requirements are necessary. Standard 120 Vac at 15 amps. The charger will not draw more than 5 amps under normal conditions.





Thick rubber floor mats can be used as a mounting surface

In cases where wall mounting is not possible, a thick rubber floor mat can be used as a mounting surface. The bracket shown above can be used on many surfaces. As long as the wheels of the robot and the bottom of the charging dock are on the same plane, reliable auto-docking can be accomplished. The mat must be heavy enough (or secured to the floor) to prevent inadvertent movement. Also, the mat material must prevent the dock from tipping forward. A sheet of aluminum or other metal under the mat may be needed.

Attach Dock to Mat



As shown in the picture, use 4 screws to attach the dock assembly. Check the alignment as described on page 5. Shims may be needed in front or rear of the bracket (between the bracket and the mat) to make sure the dock does not tip forward or back.

Floor Mat:

The charging dock can be mounted to a floor mat.

1. Select mat size and material

If the thickness of the mat is greater than 1/2 inch, the final approach of the robot must be on the mat. Meaning, the mat must be long enough to allow the full docking approach without transitioning mat and floor.

2. Attach bracket

4 Flat head, countersink screws will attach the bracket to the mat.

3. Attach dock to bracket

4 smaller flat head, countersink, hex screws attach the dock to the bracket on the sides.

4. Check Alignment

See page 5 for alignment check. Shim the front or rear mat bracket to make sure the dock is level and lines up with the robot's charging contacts.

5. Position dock before mapping

make sure the dock is in the desired location before mapping and configuration. Small variations (+/- 1 inch) will be tolerated by the robot especially if it has a long final approach to the dock.

Mat Material

Thicker material is naturally heavier and thus less susceptible to accidental movement. However, if too thick, the robot's docking run (final approach) may fail if it has to climb the lip of the mat during the run. Or make the mat long enough to ensure the robot is totally on the mat before it makes its final approach. It is best to make the mat thin with an underlay of metal or rigid plastic.



Make sure dock is level once mounted

The alignment is critical for the robot to reliably auto-dock and charge.

Charging contacts and alignment targets.



As shown in the photo, the plates of the charging dock must line up with the robot's front contact bezel. It is important the the bottom plate does not hit the front bumper but rather naturally rides up on the robot's bottom platform. As the robot pushes further into the dock, the top charging target

will slide over the bottom plate revealing the charging contacts. The robot's copper charging contacts under the top bezel will make good connection with the chargers plates. Once in the dock, the robot will command the dock to start the current flow. This can also be done manually by pressing the yellow button on the top of the dock. The yellow light on the dock will come one when charging is in progress.

Dock Alignment:

Proper alignment is necessary for reliable auto-docking.

1. Check for level dock position

With the charging dock resting on the floor (the same surface as the robot's wheels), make sure the dock is level. Add shims to top or bottom of wall mounting brackets if necessary.

2. Check robot alignment

The robot's charging assembly should line up as shown as it approaches the dock. If the dock is tipped forward, the lower plate will hit the robot's bump sensor thus causing the robot to think it hit an obstacle and back away from the dock.

3. Activate the charger manually

With the robot powered off, gently push the robot into the dock and make sure it slides in smoothly. Once fully inserted, press the yellow button on the top of the dock to start charging.

4. Observe yellow light

If the yellow light is on, charging is taking place. The green light indicates the AC power connected. Press the red button to stop charging in order to manually remove the robot.

5. Auto-docking

Once configured and mapped, the robot will automatically find, approach, and activate the dock.

Manual Activation

Once configured, your robot should not need manual intervention to maintain its battery charge. However, if manual docking is necessary, it is suggested that the robot be powered off, gently pushed into the dock until fully inserted. Then press the yellow button on the top of the dock to start the charging process. Likewise, to remove the robot manually, press the red button to stop charging then gently extract the robot until well clear of the dock before powering up.