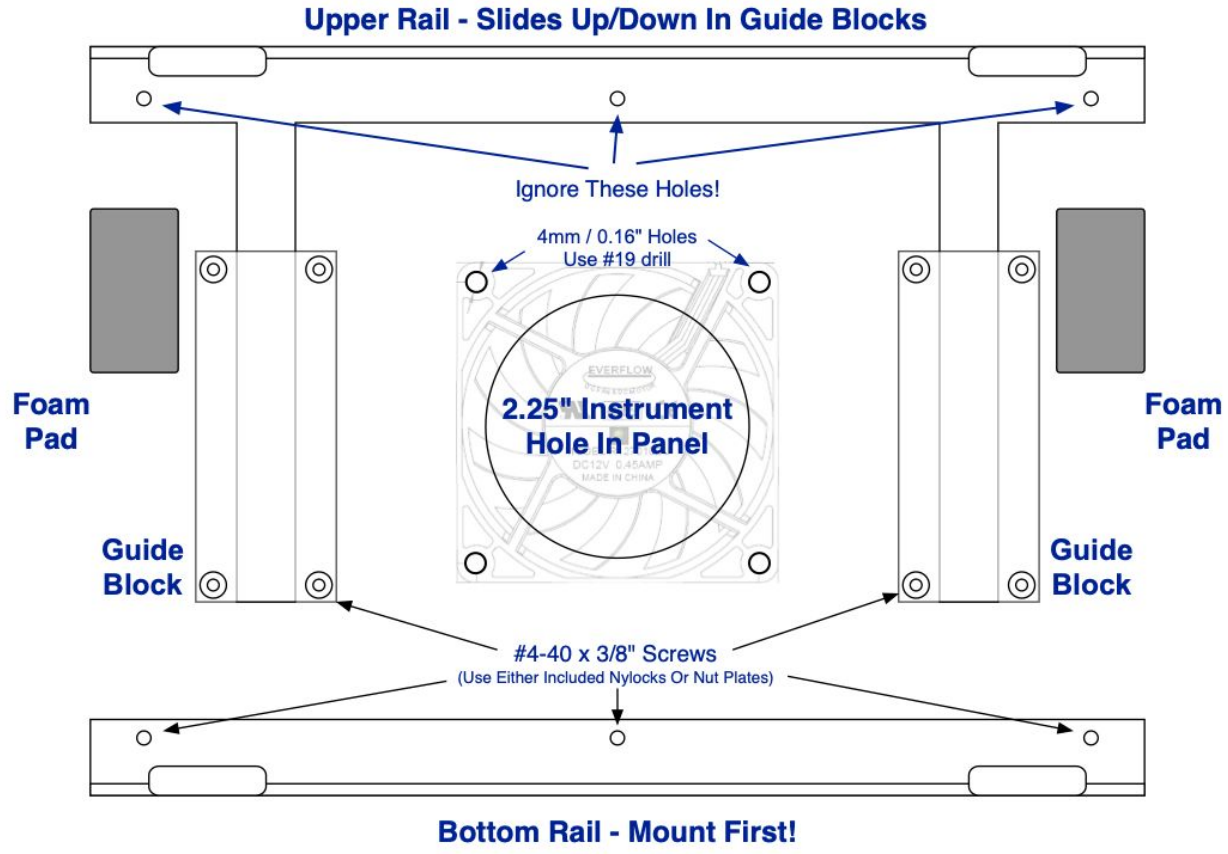
FlightDock / FlightBar Installation Guide

The FlightDock system consists of two parts - the mount and the cooling system. The mount securely holds the iPad while the cooling system directs a stream of air across the back.

The FlightDock iPad mount fits all current large format iPad tablets - basically everything but the iPad Mini.[1] FlightDock allows the user to easily install and remove an iPad from the instrument panel. It uses friction to hold the iPad in place, making installation and removal simple.

Overview



The kit consists of upper and lower aluminum mounting rails, two plastic guide blocks, the cooling fan, fan controller, two foam pads and a set of #4-40 hardware for mounting the guild

[1] You can adapt the FlightDock to hold a mini by cutting off the ends of the top and bottom brackets at the outer edge of the grip tabs. No refunds for “oops” cuts!

blocks and lower rail. The lower rail is fixed, while the upper rail slides up and down in the guild blocks, allowing the iPad to be installed and removed. The foam pads adhere to the panel and push the iPad forward against the tabs on the upper rail, helping hold it in place.

The exact positioning of the components is dependent on the panel. The installer must make sure that the mounting hardware, fan, and fan controller do not conflict with any secondary structure found on the back side of the panel.

FlightDock Mount Installation

We highly recommend printing a “paper doll” from the included FlightDock Mounting Diagram and using that to help find the best location for your FlightDock. Be sure to print it at 1:1. You can check to make sure that you have a correct print by measuring the length of either the upper or lower rail - both should be exactly 9” long. ***Please note that the screw positions may not exactly match the positions on your components: use the components, not the paper doll, to place all holes!***

First find a good spot for the lower rail. Make sure the positions of three screw holes do not conflict with anything on the back of the panel. Level and mount the lower rail using the included #4-40 ⅜ inch machine screws (or a mil spec equivalent) and either locking nuts or nut plates.

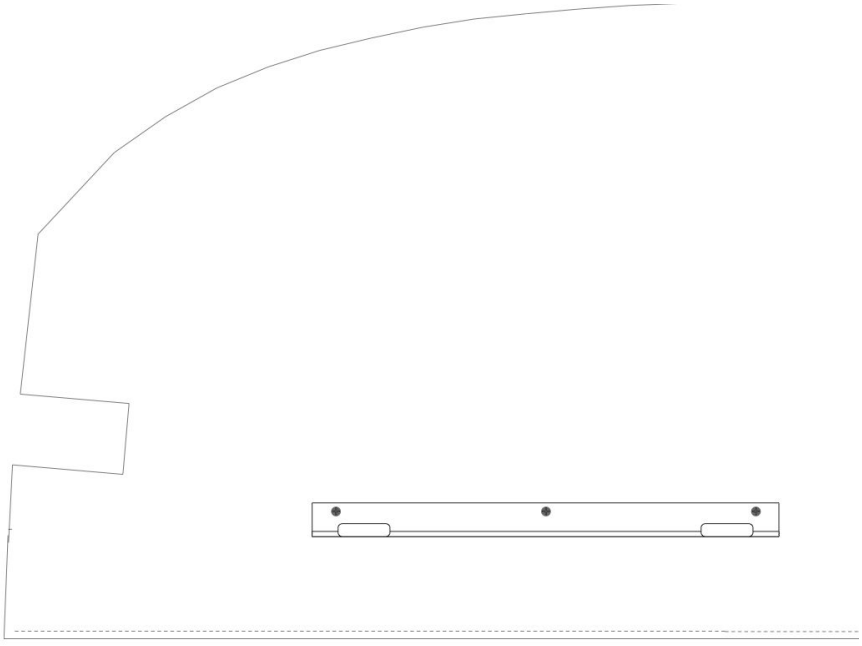


Figure 2 - Lower rail leveled and mounted to panel.

Next, place your iPad on the lower rail and slide the upper rain in behind it. Make sure there is enough clearance above the upper rail that it can slide up at least ⅜” to install / remove the iPad.

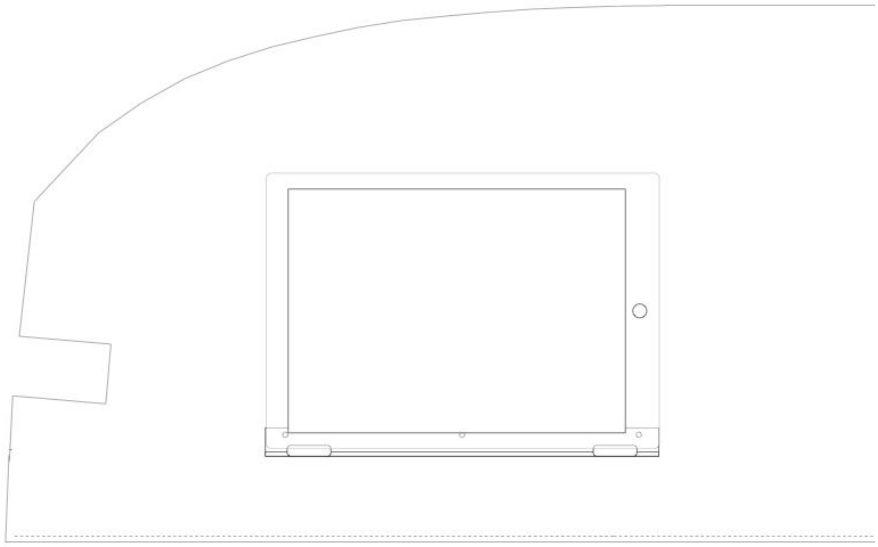


Figure 3 - iPad placed on lower rail.

Mark a line on the panel where the top of the upper rail rests when holding the iPad (i.e. when it is in the “down and locked” position). Use tape on the panel if you do not want to mark it directly.

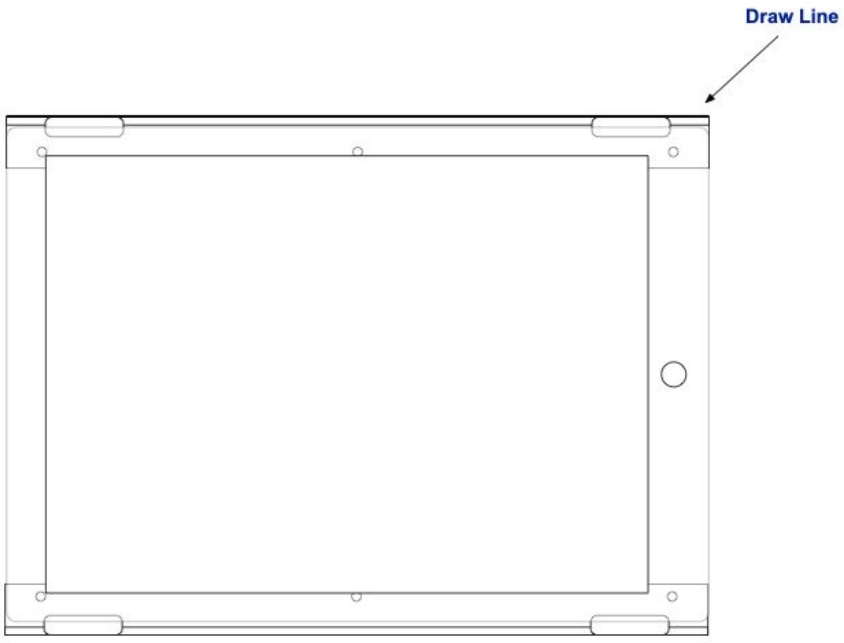


Figure 4 - Upper rail placed on top of iPad; line drawn to show placement.

Remove the iPad. Carefully line up the upper rail with the line drawn in the previous step and tape the upper rail in place.

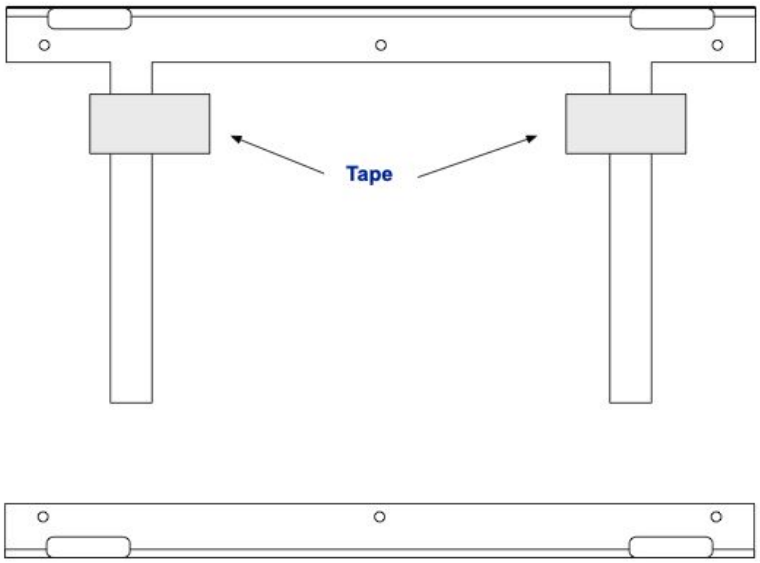


Figure 5 - Upper rail leveled with line and taped in place.

Place the two plastic guide blocks over the two vertical slide arms of the upper rail. Level them with each other. The blocks are best installed so that they cover the bottom of the slide rail when the iPad is installed and the upper rail is in its “down and locked” position.

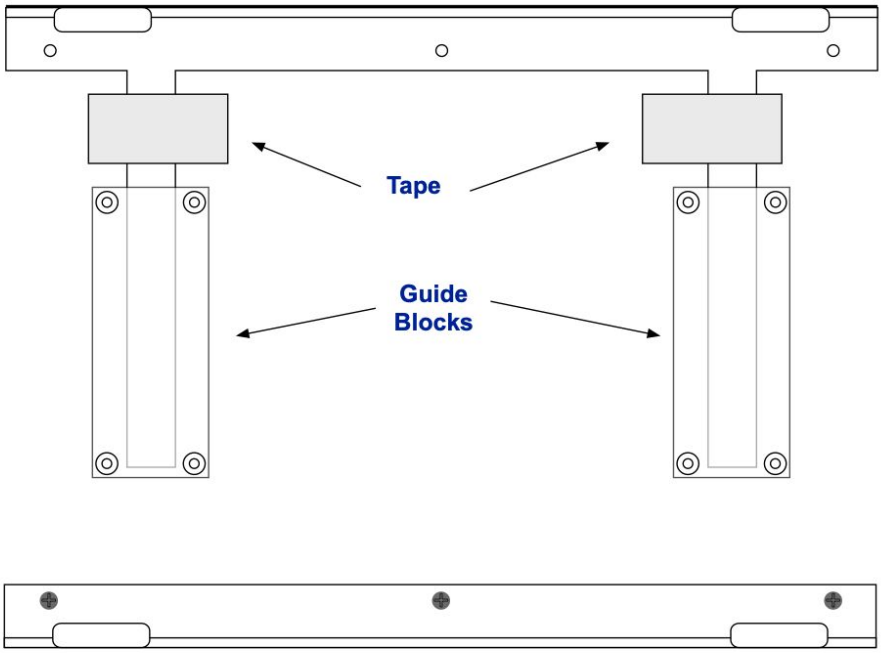


Figure 6 - Guide blocks placed over vertical slide arms.

Mark and drill holes for the guide block screws. Use the included #4-40 ⅜” screws (or mil spec equivalent) and either locking nuts or nut plates to mount the guide blocks. Mount loosely (i.e. don’t tighten up the screws).

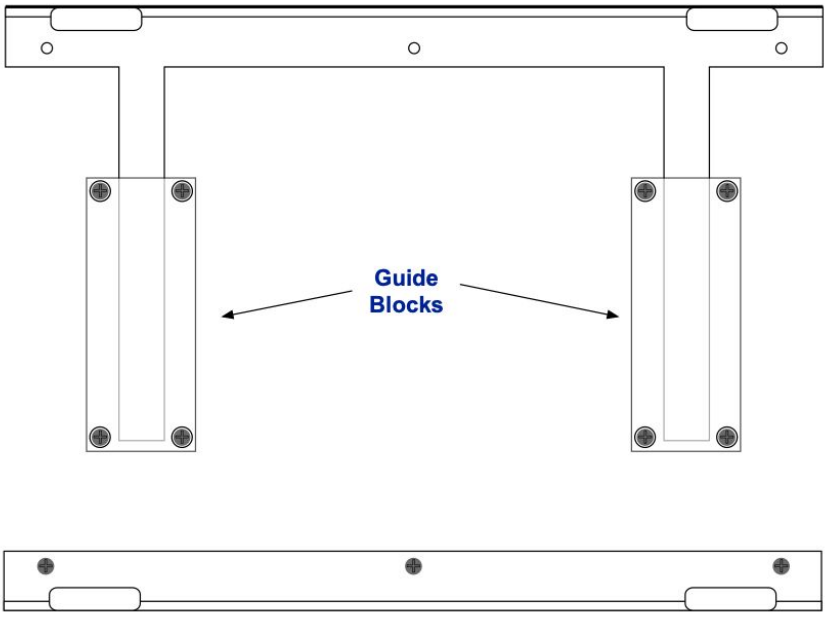


Figure 7 - Guide blocks screwed to panel.

Remove the tape. Carefully tighten the screws to the point where the rail can move up and down with modest pressure. The action on the upper rail should be reasonably stiff - if it is too loose / easy the iPad may be able to pop out in turbulent conditions.

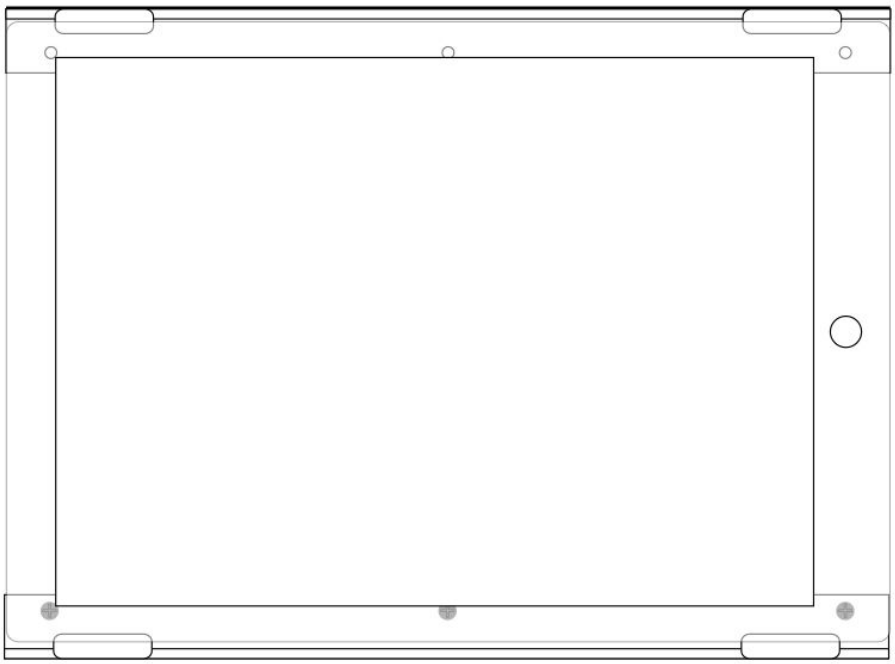


Figure 8 - iPad installed in FlightDock.

Place the iPad in the mount and test to see how well it holds. Thicker iPads will generally hold in place without any additional assistance. Thinner iPads may require foam padding be placed on the panel. The foam pushes the iPad forward into the tabs on the upper and lower rails.

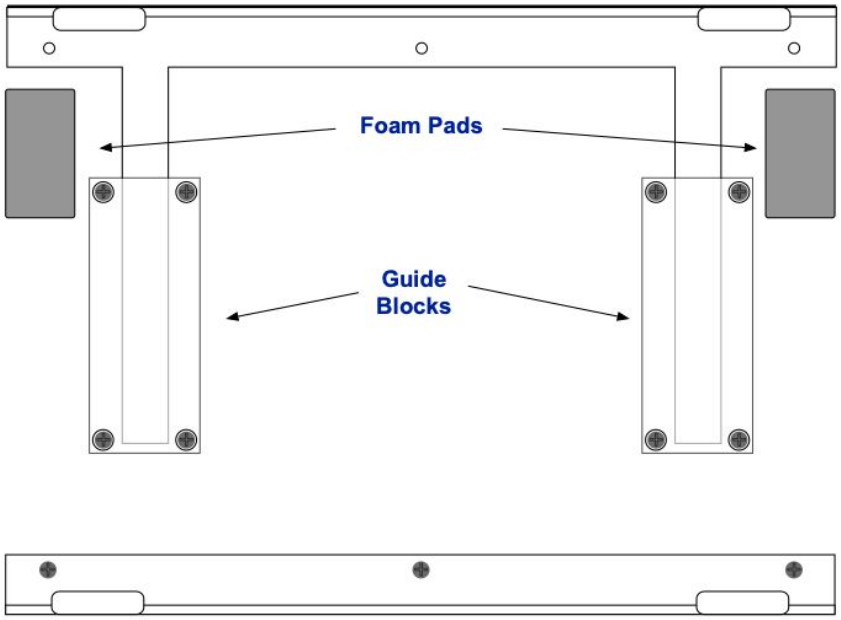


Figure 9 - Optional foam pads installed to push iPad into the mounting tabs.

Depending on the model of iPad, you may need to thin the foam down to the point where it places only a moderate amount of pressure on the iPad. You may also need to cut the foam blocks into two pieces (giving you a total of four) to provide even pressure.

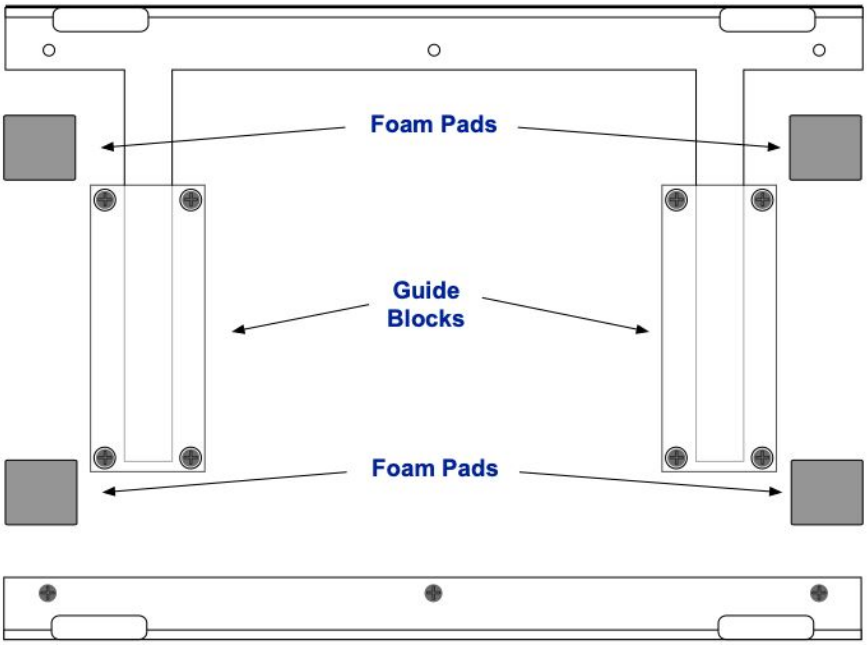


Figure 10 - Foam blocks divided to add even pressure to iPad.

Cooling System Installation

The cooling system consists of a 70mm fan and a digital fan controller. The fan directs a constant stream of air at the back of the iPad, allowing it to cool much more efficiently than using natural convection. The controller uses a solid-state thermometer to measure the temperature of the air behind the panel and adjust the flow rate as it warms.

Begin by locating the placement of the cooling fan. Typically the fan is placed where it will be centered both vertically and horizontally behind the iPad. The fan mounts ***on the back side of the panel*** and blows through the hole, cooling the metal back of the iPad.

Figure 11 - Fan Mount, view from the cabin side. (Not to scale.)

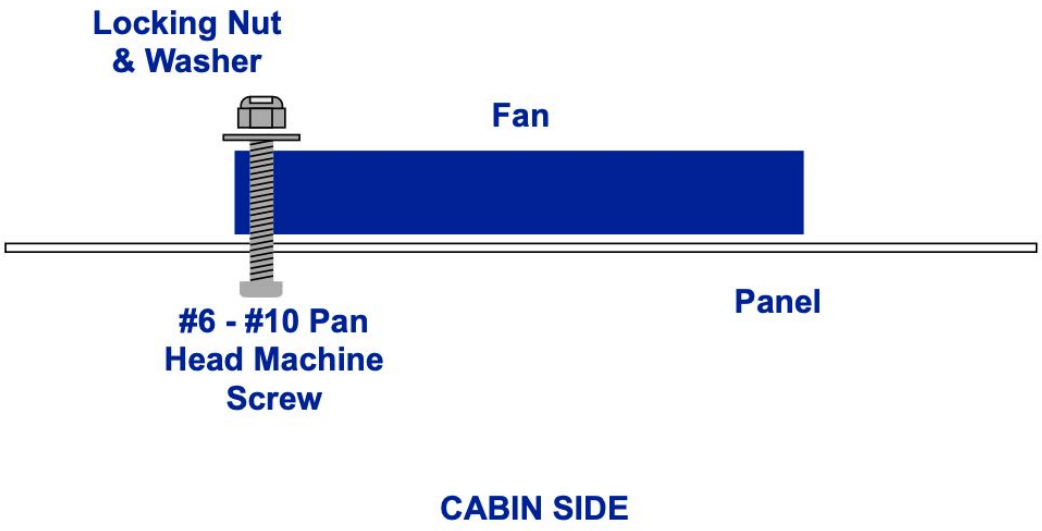


Figure 12 - Fan mount, view from above. Fan mounts behind the panel. (Not to scale.)

NOTE: Use the actual fan shipped with your kit to locate the mounting holes. The fan portion of the FlightDock Mounting Diagram is to scale for standard 70mm fans, but not all fans are built exactly to the standard!

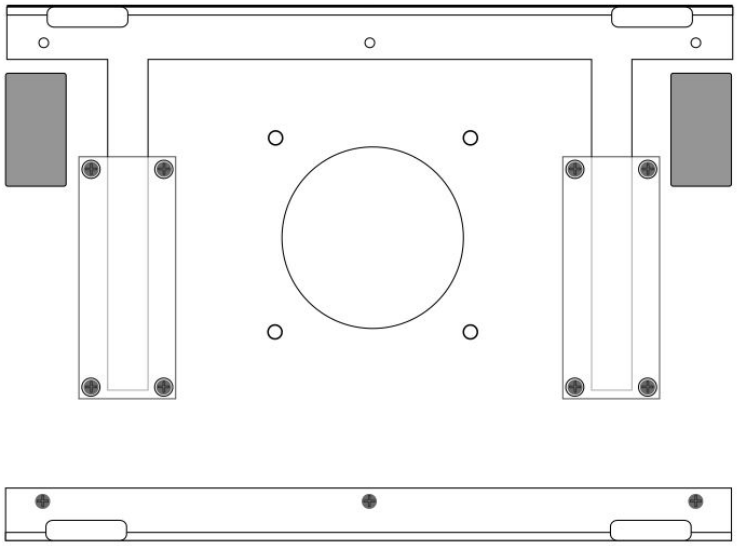


Figure 13 - Hole cut in panel for cooling fan, fan mount screws.

The hole for the fan may be up to 2.57” (70mm) in diameter. You can use a 2.25” instrument panel punch to create the hole. This blocks a small portion of the air flow but generally tends to result in a cleaner cut (unless you have access to CNC gear).

Once the hole is cut, center the fan in the hole, then mark and drill the four corner mounting holes for the fan.

Mount the fan so that the sticker is visible from the cabin. This will result in cool air from behind the panel being blown against the back of the iPad. Reversing this will significantly reduce the efficiency of the cooler.

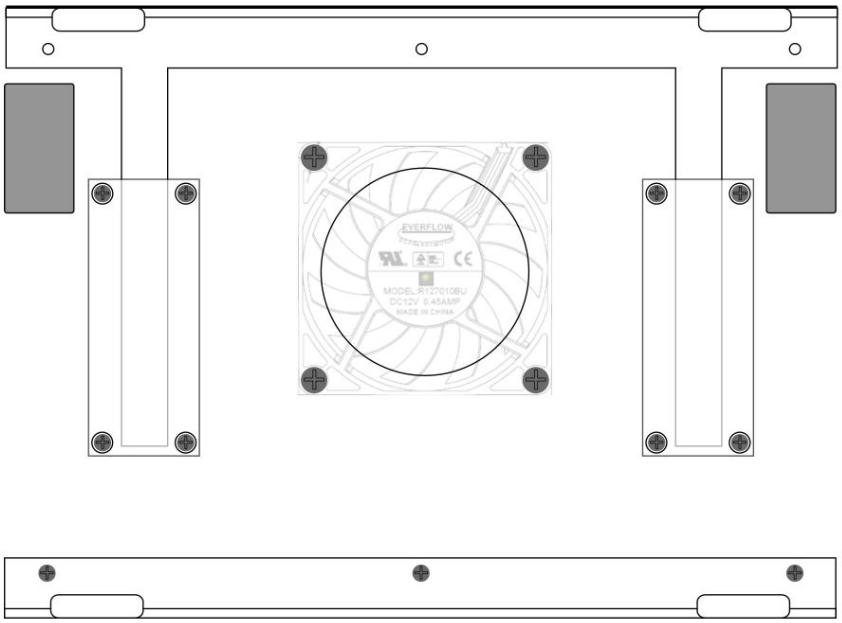


Figure 14 - Fan mounted behind the panel.

Use appropriate (#6 - #10) pan head screws, washers, and nut (not included) to mount the fan. The screw head should be on the cabin side of the panel. The screws should pass through the panel, through the mounting holes in the fan, and into locking nuts (“nylocks”). The screw heads should not stand taller than the guide blocks shipped with the FlightDock kit.

Cooling System Wiring

The cooling fan controller can handle voltages between 10v and 16v. Do not connect the controller to a 28v electrical system!

Note that it is acceptable (though not considered best practice) to use one breaker or fuse for all devices at each “station” (i.e. pilot’s PFD, co-pilots PFD, MFD). For example, if you are installing a FlightDock, FlightBar, and a charging device for your iPad, all three devices can be connected to a single breaker.

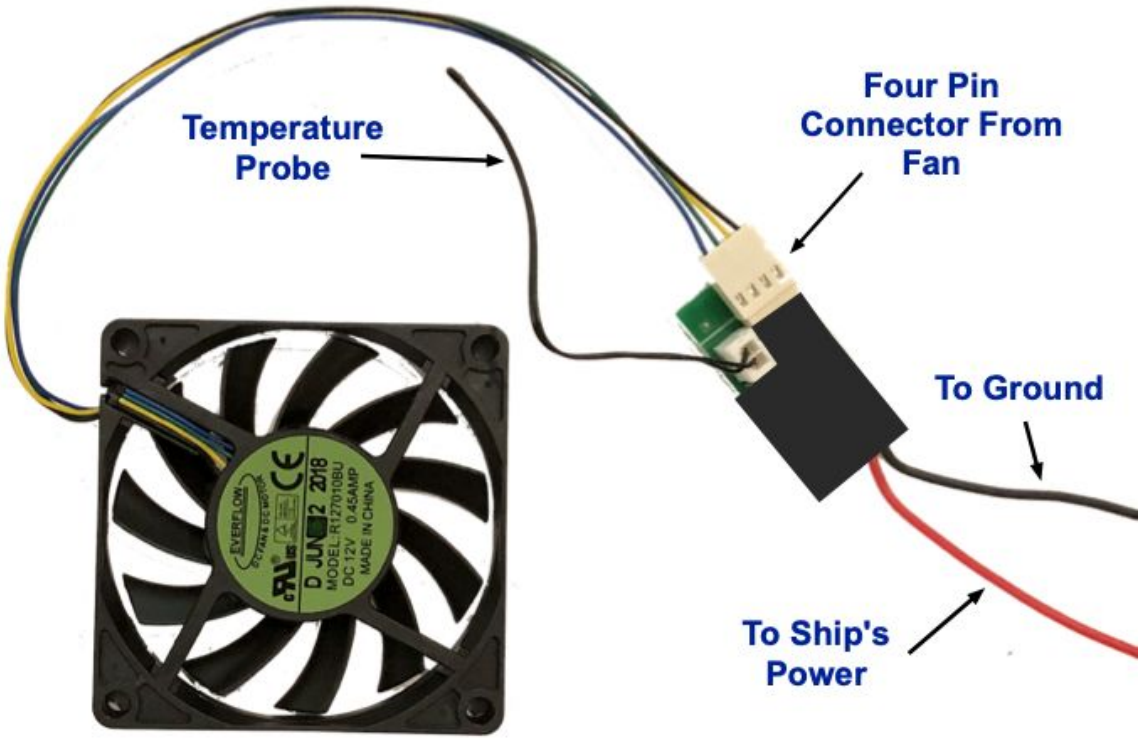


Figure 15 - Fan and controller wiring diagram.

Plug the temperature probe into the socket on the controller.

Connect the black lead from the controller to ground. Connect the red lead to ship’s power through an appropriate circuit protective device. The cooling system can draw up to 0.5 amps at 13.8v. Size the breaker or fuse appropriately - typically 1 amp for a FlightDock cooling system by itself or with a FlightBar, and 2 amps for the FlightDock / FlightBar / charger combination.

Connect the cooling fan controller to the four pin connector from the fan.

Mount the controller to the back of the panel using the attached double-stick tape. (Remove the red wrap to expose the adhesive side of the tape.)

Optionally, use tape or glue to adhere the temperature probe to the back of the panel. Doing this will provide the controller with a more accurate reading of panel temperature.

FlightBar Installation

The FlightBar tactile controller is frequently used in conjunction with FlightDock. When ordered as a bundle, the FlightBar comes mounted to the lower rail of the FlightDock. If purchased separately the user will need to connect the the FlightBar to the FlightDock using standard #4-40 (or mil-spec equivalent) hardware.

FlightBar is capable of operating off of any DC power source between 9v and 36v.

Power is fed to the FlightBar via a pair of wires which terminate in a Molex JST-PH 2-pin connector. Each FlightBar ships with the power connector pre-installed. If the power cable needs to be removed from the FlightBar, be gentle. Use of fine-point needle-nosed pliers is recommended.

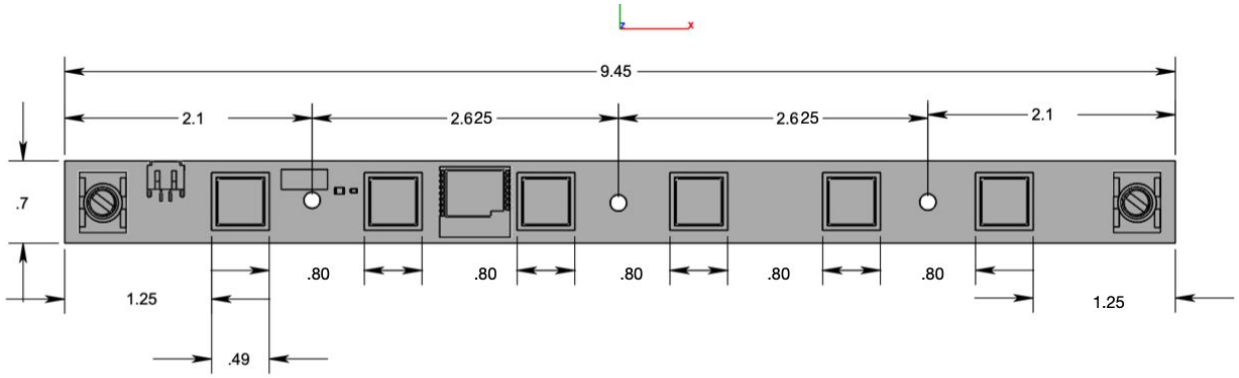
In a typical installation, the FlightBar's power leads are fitted through a small (~0.25") hole in the panel. It is recommended that the installer use either a grommet or a layer of heavy duty heat-shrink tubing to protect the wires.

The red wire should be connected to ship's power through a circuit breaker or other circuit protective device. The black wire should be connected to ground. Ideally, the circuit that powers the FlightBar will be energized automatically when the avionics bus is powered up.

While it is generally considered best practice to wire each device through its own circuit protective device, it is acceptable to use a common power source to run the FlightBar, FlightDock cooling system and an iPad charging device (USB or USB-C charger).

FlightBar Flush Mount

Some users have indicated that they would like to mount a FlightBar control directly to their panel, rather than via the hangar that ships with the system. The following diagram shows the basic layout of components on the board.



Users using CNC machinery to cut their panel may find it easier to import a STEP file of the circuit board. Please contact Open Flight Solutions for a copy of the file.

Note that any damage caused by removing the FlightBar from its enclosure or using it without its enclosure is not covered under warranty.