

# Wired Data + Charging Kit - USB C iPads Installation Guide

The wired data kit allows you to use a hardwired connection between your Flight Data Computer and your iPad. This is somewhat more reliable than using Wifi as it is less vulnerable to interference from other aircraft systems or high intensity radiated fields (radio towers, radar installations).

The kit includes:

- 12v "cigarette lighter" socket



- 48 watt USB-C Power Delivery (PD) charger with high capacity USB-C cable



- USB-C to Ethernet adapter + 3' Ethernet cable



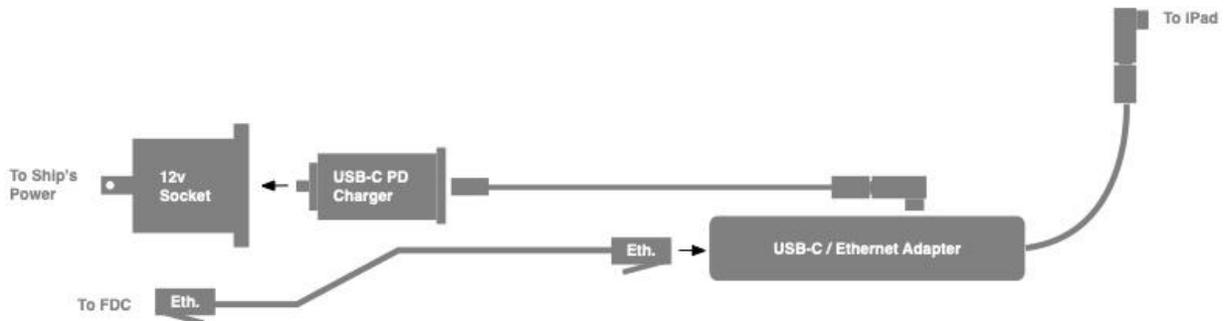
- 2x USB-C 90° adapters



Not included but required for some installations:

- Circuit breaker - 5 amp
- Longer or shorter Ethernet cable (CAT5, 5e, or 6 - preferable shielded)
- [3M Scotch 5952 VBH tape](#) (optional)
- [Blue Sea Systems 12v socket mounting bracket](#) (optional)

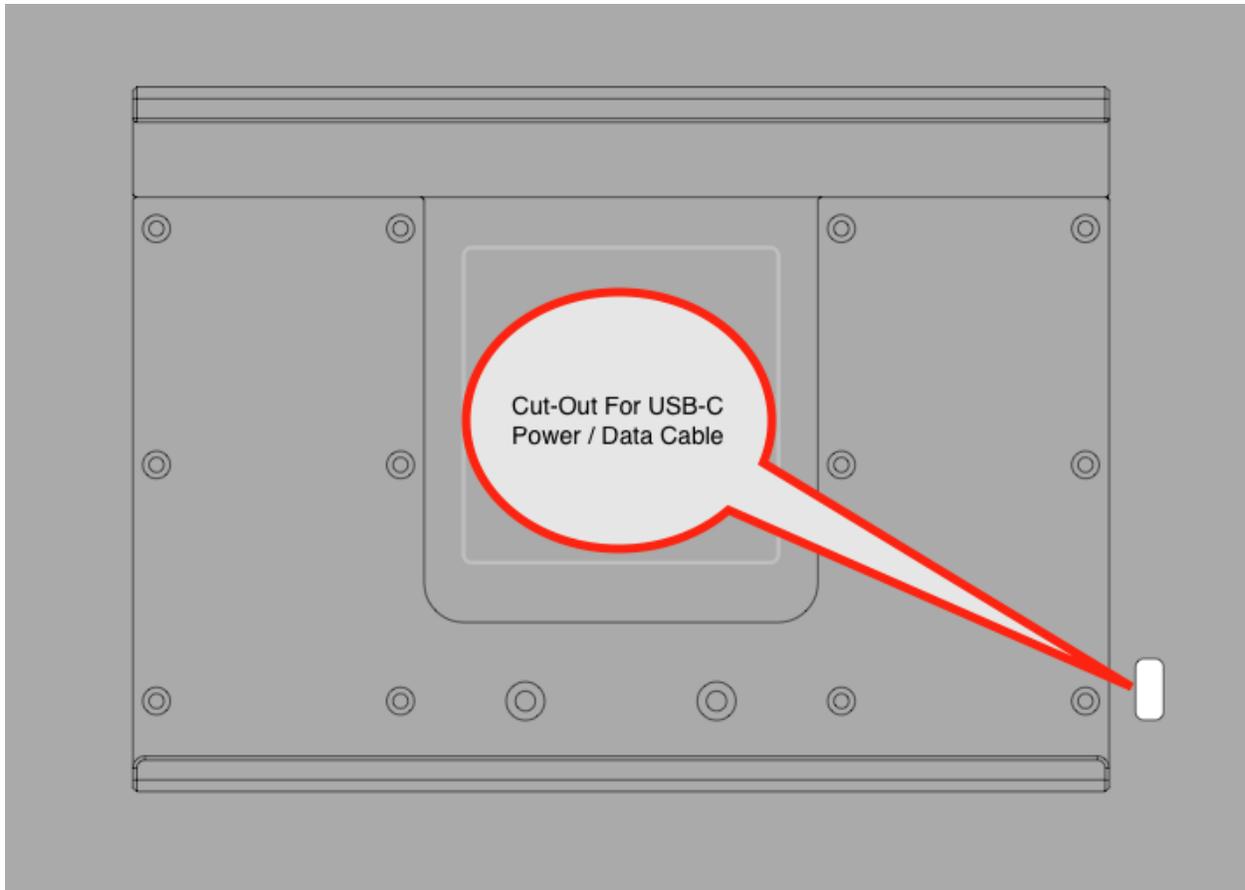
## Basic Assembly Diagram



## Before Assembly

Before you assemble the kit you will need to figure out the locations for your iPad, charger, Ethernet adapter.

- The iPad is typically mounted on the front of the panel using the Falken FlightDock or some other mounting device.
- The charger mounts behind the panel, frequently in a sub-panel. In some cases it may be advantageous to use a vertical mounting bracket (see optional item above). The included USB-C power cable is 3' (1m), so make sure that the socket is mounted close enough to the iPad for the cable to reach.
- The USB-C to Ethernet adapter is usually affixed to the back of the panel using heavy duty double-sided tape. It has a ~6" cable, so it will need to be located in a position that allows the cable to reach the iPad's USB-C port. This generally requires a hole in the panel sized to allow the USB-C plug to fit through from the back.
- The included Ethernet cable is 3' long. If your installation requires a longer cable to reach from the FDC's Ethernet port to the USB-C Ethernet adapter, you will need to source an appropriate cable. We recommend using shielded cable as it reduces the likelihood of electromagnetic interference.
- If the 3' Ethernet cable is too long you may either shorten it, crimping on a new Ethernet plug, or you may replace it with a shorter cable.



## Attaching 90° USB-C L Adapters (Optional)

Your kit includes two USB-C L adapters, small milled aluminum fittings that connect to the end of USB-C cables. These are quite useful in saving space and make for a neater installation. One goes on the USB-C cable that runs from the charger to the Ethernet adapter. The other goes on the 6" cable that runs from the Ethernet adapter to the iPad.

If you opt to use the L adapters to save space you will want to reinforce the connection to prevent them from disconnecting accidentally or due to aircraft vibration. To secure the L adapter, connect it to the USB-C cable then wrap one layer of electrical tape around the connection point to secure it. For extra protection, place the included shrink wrap tubing over the joint and heat to shrink.

If you need to remove the adapter, use a knife to carefully remove the shrink wrap tube, then remove the tape.

Do not attach the L adapter to the 6" cable that runs from the Ethernet adapter to the iPad until it has been inserted through the panel - this allows you to make a much smaller hole in the panel for the cable. You can attach the L adapter to the 3' power cable at any time.

## Install the Charger

If you're mounting the charger directly into a sub-panel or other piece of substructure you will need to punch or drill a 1 ¼" hole with at least 2 ½" of clearance behind it for the body of the socket and wires. Mount the socket by removing the large plastic nut from the barrel of the socket and inserting it into the hole. Secure it with the nut.

If you're using the Blue Sea Systems mounting bracket you will simply need to affix the mount to the substructure using two screws. Once the bracket is secure, remove the large plastic nut from the socket, insert it into the bracket, and re-install the nut to secure it.

### Procedure

1. Connect the black cable to the negative (-) terminal on the socket.
2. Connect the red cable to the positive (+) terminal on the socket.
3. Mount the charger as described above.
4. Connect the free end of the black cable to ship's ground.
5. Connect the free end of the red cable to ship's power. To use a circuit breaker rather than the included fuse, cut the wire ahead of the fuse holder and connect it to the circuit breaker.
6. Insert the charger into the socket. Make sure it seats securely.

If you opt to use a circuit breaker rather than the included fuse, use at least a 3 amp breaker and no more than 5 amp breaker. The charger can draw a maximum of 48 watts (4 amps).

## Mount The USB-C to Ethernet Adapter

The adapter is typically attached to the back of the panel using industrial strength double-sided tape. This is quite secure, but does make it somewhat challenging to remove / relocate, so be sure to "dry fit" it first. When you are ready to permanently mount it we suggest using two small ½" x ½" squares of 3M VBR tape rather than a strip the full length of the adapter.

Be sure to leave room for the Ethernet cable to connect to the Ethernet jack at the end of the adapter.

Be sure to leave room for the USB-C cable to attach to the USB-C Power Input jack on the body of the adapter. You can connect either directly or with one of the 90° L adapters included with the kit.

Locate the adapter such that the 6" USB-C cable can extend through a small cut-out in the panel and reach the USB-C port on the iPad. If you choose to use the 90° L adapter (recommended), note that this adds ~¾" to the length of the USB-C cable.

Generally it is best to make the hole in the panel just large enough for the USB-C cable - not large enough for the 90° L adapter. Mount the Ethernet adapter first, then attach the 90° L adapter as described below.

## Procedure

1. Feed the Ethernet adapter's USB-C cable through the panel
2. Attach the USB power cable to the Ethernet adapter, optionally securing it with safety wire or heavy duty tape.
3. Affix the Ethernet adapter to the back of the panel using double-stick tape

## Connect Cables

Once the components are mounted you will need to make a number of connections:

1. Connect the charger to the USB-C to Ethernet adapter using the high capacity USB-C cable.
2. Connect the Ethernet cable between the FDC's Ethernet port and the USB-C to Ethernet adapter's Ethernet port.
3. Connect the USB-C cable from the Ethernet adapter to your iPad.

As with any aircraft wiring, the cables should be secured with zip ties and/or adel clamps. You will want to prevent the cables from vibrating as that can lead to wear on the connectors, causing signal and power failures.

## iPad Configuration

You will want to disable the Wifi connection between your iPad and the FDC to avoid creating a duplicate connection path (which wastes system resources and can cause interference). You can do this by either turning off the Wifi feature on your iPad, or by telling the iPad to "Forget" the "FlightBox-EXP" network connection.

## Boot Up / Testing

To test out the system:

1. Make sure the Wifi function on your iPad is turned off.
2. Insert the iPad into its mount and connect the USB-C cable from the Ethernet adapter.
3. Power on your aircraft's avionics bus, powering up the charger and your Flight Data Computer.
4. Allow 30 - 45 seconds for the FDC to boot up.
5. Unlock the iPad and launch the FlightView app.

Both the link activity lights on the Ethernet adapter should come on - one green the other amber. The FlightView app should begin receiving data over the wired connection.

## Troubleshooting

### Not Working (No Data) - Version 1

#### Symptoms

FlightView cannot connect to the FDC and is operating in reversionary mode. No lights (LEDs) on the USB-C to Ethernet adapter are on or blinking.

#### Likely Causes

1. Bad connection between the iPad and the Ethernet adapter.
2. Failed USB-C to Ethernet adapter.

#### Things To Check

- The iPad powers the adapter, so make sure the iPad is charged and turned on.
- Check that the cable from the adapter is securely connected to the iPad.
- Verify that the 90° L adapter is securely connected.

### Not Working (No Data) - Version 2

#### Symptoms

FlightView cannot connect to the FDC and is operating in reversionary mode. Adapter lights are on / blinking.

#### Likely Causes

1. Ethernet cable is loose.
2. FlightView does not have permission to connect to the local network.

#### Things To Check

- Make sure the Ethernet cable is securely connected to the FDC's Ethernet port and to the USB-C to Ethernet adapter.
- In the iPad's main settings app, check under Privacy to make sure that FlightView has permission to access Local Network resources:
  - Launch the iOS Settings app
  - Tap on the blue Privacy icon
  - Select the Local Network option from the menu on the right
  - Make sure that FlightView appears in the Local Network list and that the switch at the right-hand side of the page is turned on (green).

### Working But Not Charging

#### Symptom

FlightView is working but the iPad does not appear to be charging (the battery indicator in the upper right-hand corner of the iPad is not green).

### **Likely Causes**

The USB-C charger is not fully seated in the 12v socket. USB-C power cable is loose. Bad charger.

### **Things To Check/Try**

- Check to make sure the charger is fully inserted into the 12v socket.
- Verify that the USB-C cable from the charger to the Ethernet adapter is connected at both ends.
- Check that the USB-C charger is working by connecting another USB-C device directly to the USB-C PD port on the charger.

## Data Drop-Outs, Slow Responses, General Weird Behavior

### **Symptoms**

Instruments briefly, intermittently drop out (red X across the instrument). Reconnect notifications. Flickering failure icons in the Status Bar. Sluggish response to commands. Other unexpected behavior.

### **Likely Causes**

1. The iPad is connected to the FDC by both Ethernet and Wifi creating a "dual path" scenario which can cause problems.
2. The Ethernet cable is experiencing interference from other devices in the cockpit.

### **Things To Check/Try**

- Make sure the Wifi interface on the iPad is not connected to the FDC's Wifi network. You can either turn Wifi off or tell the iPad to "forget" the FlightBox-EXP network.
- Relocate the Ethernet cable, avoiding other avionics and cables.
- Replace the Ethernet cable with a shielded cable. Use as short a cable as is practical.

## Images / Diagrams



The USB-C to Ethernet adapter with the power input connected and the 90° L adapter.



The 90° adapter with a band of electrical tape securing it to the cable.



The 90° adapter with heat shrink tubing over the tape junction for extra security.

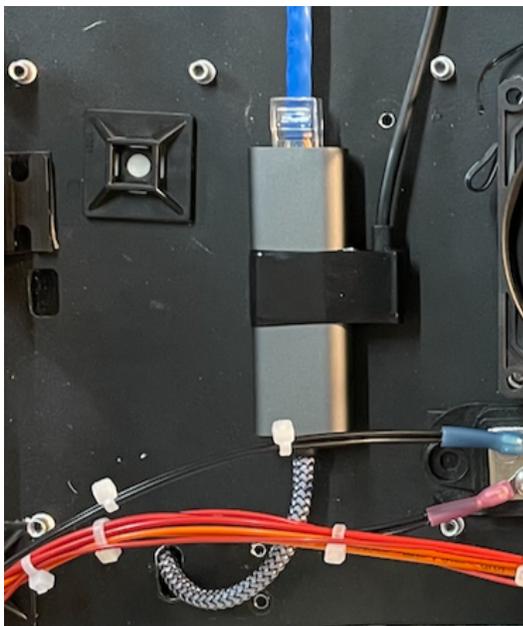


90° adapter fully sealed and ready to connect.



Adapter installed through the panel. Locate the hole for the adapter cable so that the USB-C plug lines up with the USB-C jack on the side of the iPad.

Note that USB-C is non-polarized - you could also make the hole at the top and feed the cable down to the iPad.



Adapter connected to power and Ethernet and mounted to the back of the panel. Note the electrical tape securing the USB-C power input.