Orion SE Gateway LTE Retrofit Kit Installation Guide 22-apr-2021

Origination and History
22-apr-2021 - Original Version: Pautz, Steven, JaxComm

Support and assistance: support@ionware.com -or- 636 273 4225 opt 2 (M-F 8 a.m. - 5 p.m.)

Items and Tools needed for installation

1. Laptop with ethernet port to confirm Internet access thru the e-cell modem
2. Ethernet cable to connect laptop to ethernet port to e-cell ethernet port, 3 to 6 feet length
3. Small bladed, regular screwdriver to unscrew clamping screws on PCB terminal block. The blade width should be 1/8" to 3/16" in size.
4. Large bladed, regular screwdriver to assist in installing and removing clips off of battery frame within the Orion SE enclosure
5. Volt meter to confirm voltages before attaching equipment
6. A power supply for the Orion SE gateway that is completely on the ground so that the Orion SE gateway can be powered up and tested while on the workbench.
7. 6" ethernet cable with right-angle ends
8. A zip tie to secure the existing ethernet cord within the enclosure on the wire organizer
9. A small open ended wrench (5/16" or 8 mm) to unscrew and also tighten the SMA connector

What is in the kit

1. Pre-configured Multitech e-cell modem with provisioned SIM card
2. Pre-wired step-down power supply to convert 24 volts to 12 volts. Note red and black pairs are 24 volt input into transformer, yellow and black pair are 12 volt output from the transformer
3. 2 WAGO connectors, 3 way
4. Clips to mount the e-cell modem inside the enclosure, including mounting screws.
5. Cilps to mount the transformer inside the enclosure, including mounting screws.

Assembly Instructions

1. Remove all cables and connectors from Orion SE enclosure and place on work table with the enclosure connections facing you
2. Remove all power connections from the box.
3. Open the enclosure and disconnect the battery from the PCB for safety. The PCB should be completely de-energized at this point. The Status light should be off.
4. Remove the existing ethernet cord from the ethernet jack on the PCB. Insert one end of the right angle included ethernet cord into the ethernet jack on the PCB. The other end should be loose until the e-cell modem is mounted.
5. Remove the existing SMA cable from the PC by unscrewing it. It is typically tight and needs a wrench to loosen.
6. Mount the power supply on the left of the battery frame. Mount the e-cell modem on the right side of the battery frame. A large, regular screwdriver can be used to gently spread the clips so they will snap onto the battery frame. The components will slide back and forth to assist with placement. If removal is needed, use the large screw driver to gently pry the clips apart. A technician's tip is to align clips on the top and then push down gently on the clips and then push the bottom of the clips in toward the battery frame. Removal is to pry up gently on the top of clips so they will release from the battery frame.
7. Test that the power plug from the transformer fits into the e-cell modem. Test that the ethernet cord fits into the e-cell modem. The cable should point upward to avoid hitting the power plug.

8. REMOVE THE E-CELL POWER PLUG AT THIS POINT so it can be tested for voltage and polarity in the testing section.
9. Identify the power block on the PCB labeled J15. There is 1 negative terminal and 2 positive terminals. The original brown wire is negative or ground. The original white wire is positive 24 volts. The white wire will be found in the center of the terminal block and the brown wire will be found furthest away from the blue wire in the terminal block.
10. Unclamp these wires by unscrewing screws clamping the wires using the smaller screw driver. Only unclamp the white and brown wire. Leave the blue wire clamped.
11. There are 2 WAGO connectors pre-built. The positive WAGO will have yellow and red wires. The yellow wire will be loose. The negative WAGO will have 2 black wires. One black wire will be loose. Identify these wires.
12. Attach loose end of the black wire from the negative WAGO connector into the terminal where the brown wire was found. Attach loose end of the yellow wire from the positive WAGO connector into the terminal where the white wire was found. Tighten the clamping screws and tug test.
13. Insert the white wire into the open port of the positive WAGO and close the lever. Flip over the WAGO and inspect the clamp to ensure the connection is solid. Tug test the white wire to make sure it will not come out of the WAGO.
14. Repeat the same process for the brown wire. It must go into the negative WAGO with 2 black wires. Close the lever and inspect the back side and tug test.
15. Using the zip tie, attach the ethernet cord removed from to the existing wire organizer so it will never make contact with the PCB.
16. Attach the SMA connector to the e-cell modem if the external cellular antenna is available. Otherwise, use the antenna from the kit. Internet access will be confirmed during testing so a temporary antenna is adequate.

Testing Steps

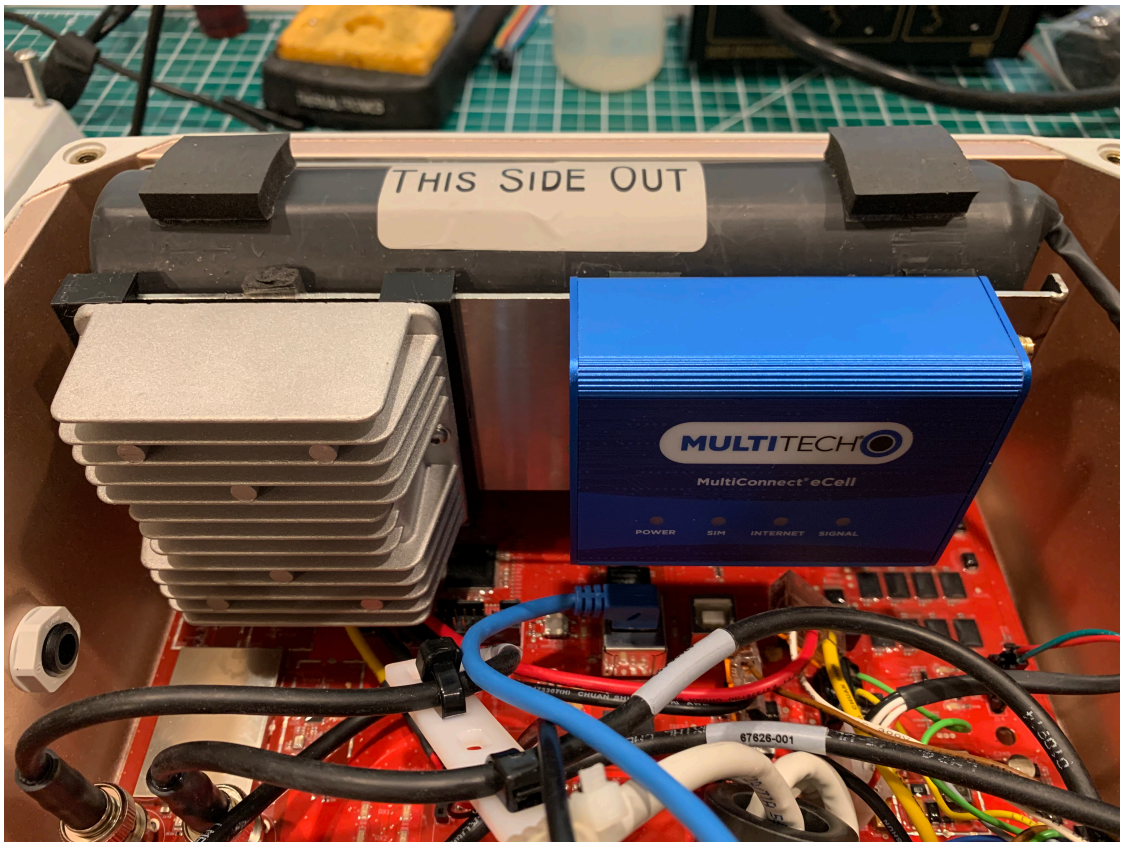
1. Confirm the SIM card is in the SIM card slot.
2. Make sure the power plug is not installed in the e-cell modem. This is a precaution that if the polarity of the plug is reversed, no damage will occur to the modem.
3. Power up the gateway using the extra external power cable for the gateway. The green status light should illuminate.
4. Using the voltmeter selected for voltage above 24 volts, connect the red lead to the positive WAGO with the red and yellow wires. Connect the black lead to the negative WAGO connector with the 2 black wires. The voltmeter should display about 24 volts positive. Confirm it is is NOT 24 volts negative.
5. Test the power plug that goes into the e-cell modem with the red lead inside the plug and the black lead on the outside of the plug. The voltmeter should show 12 volts positive. Confirm its NOT 12 volts negative.
6. If the voltages do not appear as documented in this guide, stop and get help. Do not proceed.
7. After testing voltages, plug the the power plug into the e-cell modem. The POWER light should turn on.
8. Wait until the all 4 lights turn on. This can take up to 2 minutes. The SIM LED indicates the SIM card is recognized. The Internet LED indicates connection to the Internet. The SIGNAL LED indicates the cellular network is available. The SIGNAL indicator will not light if a compatible antenna is not attached.
9. Attach your laptop to the e-cell modem using an ethernet cord. Go to the command line and type ipconfig/all and press ENTER. Your ethernet adapter should show an IP address similar to 192.168.2.x. This means that the e-cell modem provided an IP address to your laptop. Get help if this does not work. Browse the Internet using an Internet browser. Search for something new. This pages should load. If not, get help.

10. Management of the modem is completed using the address 192.168.2.1 in the web browser and pressing ENTER. Contact Ionware/JaxComm for credentials.
11. Detach the laptop ethernet cord from the e-cell modem. Insert the right angle ethernet cord into the e-cell modem with the cord pointing up.
12. Monitor Read Center or Beacon gateway sections in those systems to confirm this gateway has a recent check-in time. This may take up to 30 minutes but typically occurs immediately.

Post Test Steps

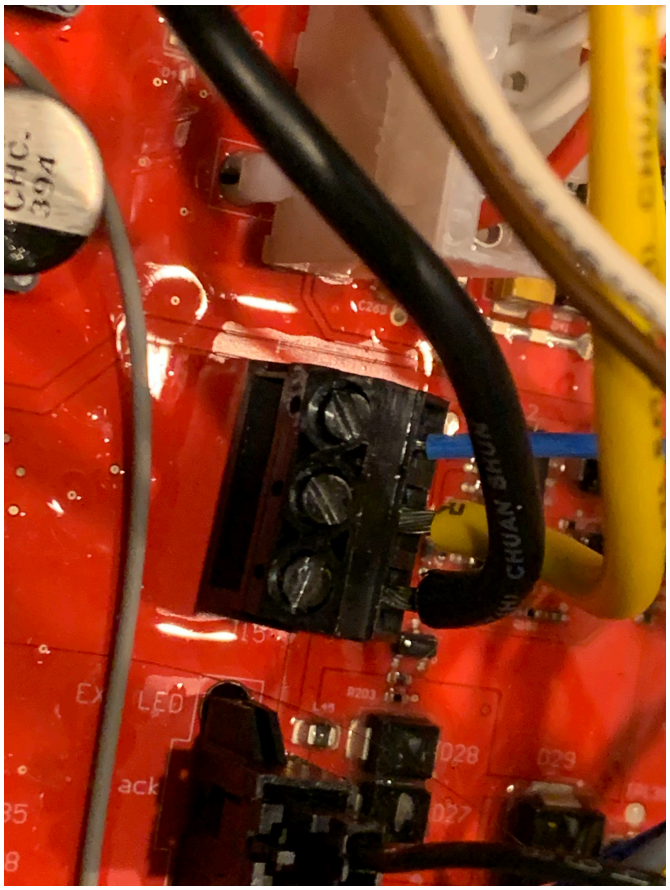
1. Attach the battery plug to the PCB
2. Disconnect the external power from gateway enclosure. The green light will start flashing.
3. Review the enclosure for anything left loose or any metal objects that could touch the PCB.
4. Remove any temporary antenna used during testing. Attach the SMA connector from the enclosure and tighten with a wrench but don't over tighten.
5. Attach the top cover for the enclosure box and snugly tighten the screws.
6. Re-install the gateway to its original location. The green status light will continue to flash until external power is re-attached and then the status light should turn green.
7. Attach all original antennas and verify readings are received into the appropriate systems.

Reference Photos

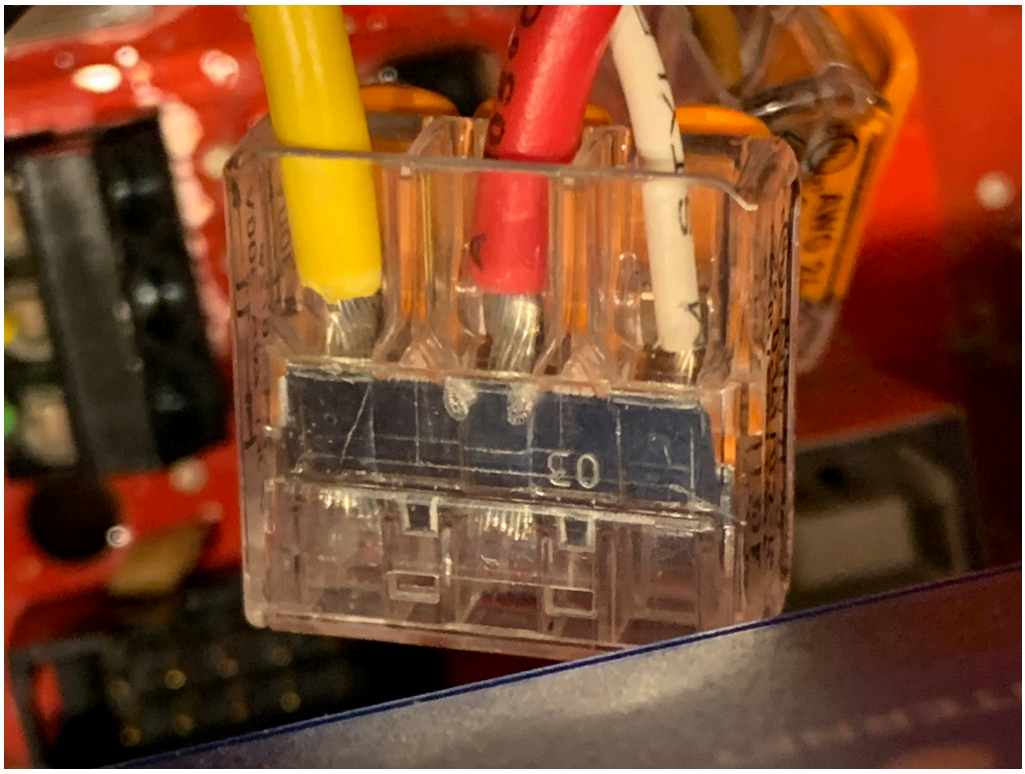


Power supply and e-cell modem mounted

Test fit right angle ethernet cord and modem power plug

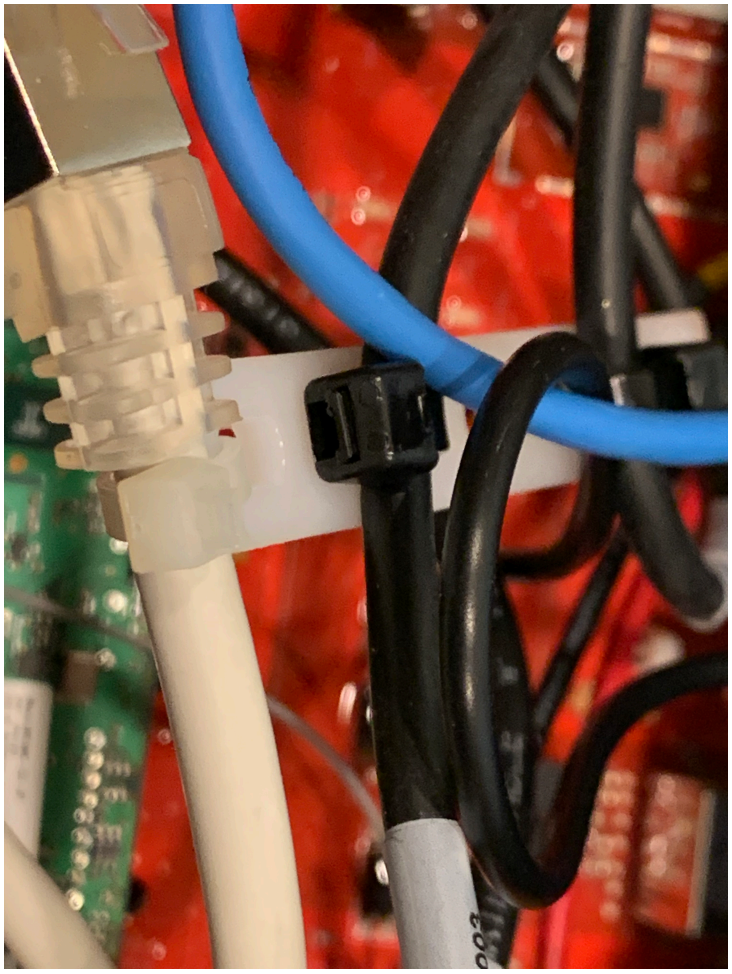


J15 Power block on PCB. Black replaces brown, yellow replaces white



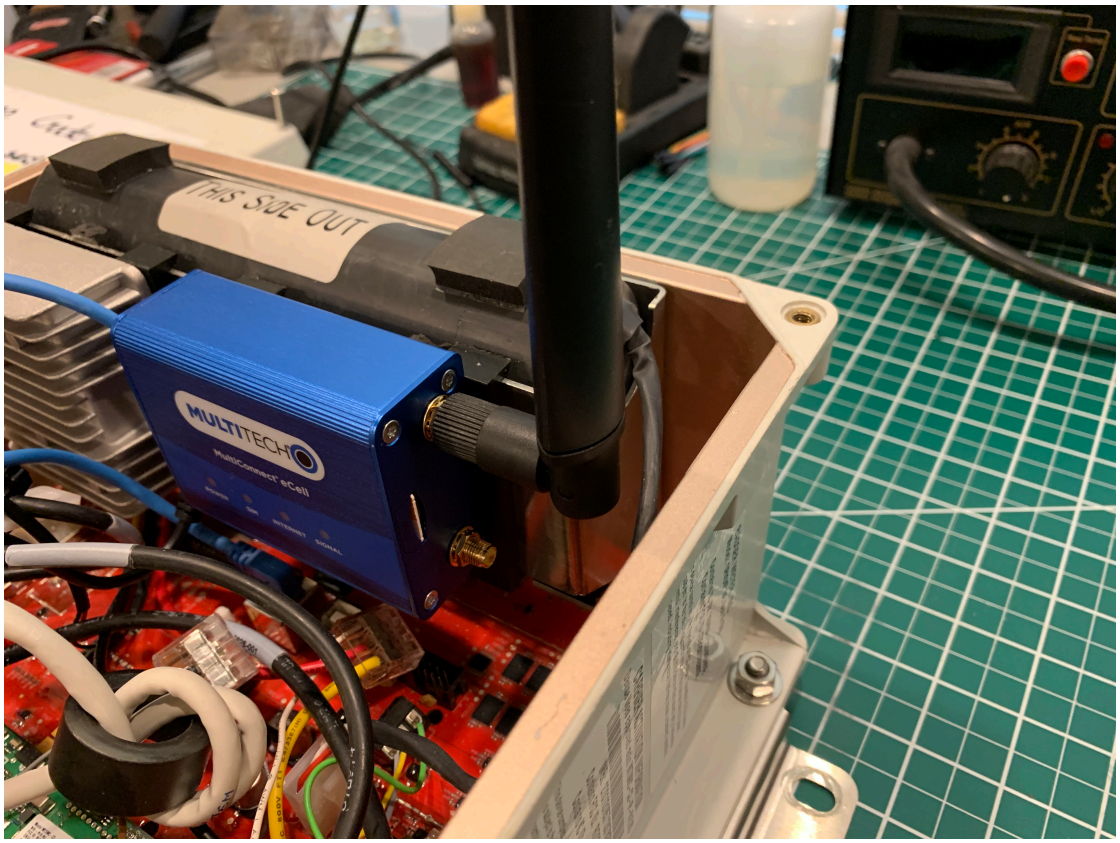
Positive WAGO

Negative WAGO

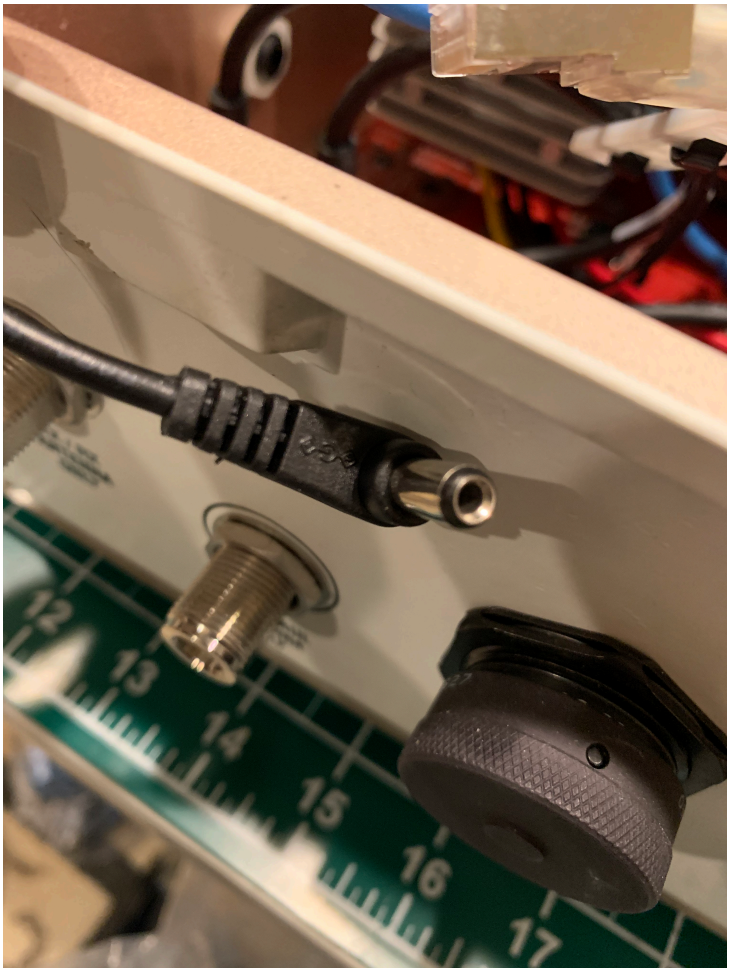


Secured ethernet cord with Zip Tie

SMA connector from PCB - connects to CELL



Temporary antenna for testing, if needed



e-cell power plug - positive center - 12 volts

Status light, external power: steady on battery: flashing

Modem status lights