SPX Flow, Inc. – LIGHTNIN – 135 Mount Read Blvd., Rochester, NY. 14611

Lightnin Lab Procedure

Title: Strain Gage Wiring

Author:

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Description

The purpose of this document is to detail the installation of strain gauge wiring to the gauges and plugs for the strain measurement telemetry system.

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Equipment List

- Soldering Iron
- Solder
- 8 strain Gauges
- 3 conductor 22AWG shielded, grounded wire
- 2 Aircraft Grade 7 Pin IP68 Male plugs
- Soldering stand
- Liquid Electrical Tape
- Adhesive Lined Heat Shrink wrap
- Heat Gun
- 4 colors of electrical tape to help coordinate wires

Resources

Lab technician

Reference Documents

Strain Gauge Wiring Schematic “P16315 Strain Gauge Wiring Schematic”
Wire Tables “P16315 Wire tables”

Procedure

1. Plug in Soldering Iron and wait a few minutes for it to heat up.
2. While iron is heating cut 3 or 4 sections of wire 8 inches longer than shaft length from telemetry transmitter to blade hub (one section per blade for installation of strain gauges).
3. Place copies of wire tables in front of soldering station for reference.
4. While placing cable assemblies into plugs, use pieces of different colored tape, or tape with wire numbers written on them to be able to know what wire is which went they are soldered into the plug.
5. Take plug and wire pins JP1-(1-3) with 3 signal wires in a cable assembly. Using wire tables and cable assembly one as reference for to and from location of wires.
    a. Take plug and separate into its two pieces.
    b. Slide wires through the back side of plug (side without any pins) and remove a small portion of the shield and out cable to access wires, but leave shield ground cable
    c. Using wire tables solder cable assembly 1 onto pins JP1(1-3)
    d. Solder a 1 inch piece of wire to JP1-4 according to wire tables, then using wire tables solder the shield ground to this wire
6. Take plug and wire pins JP1-(5-7) with 3 signal wires in a cable assembly. Using wire tables and cable assembly one as reference for to and from location of wires.
    a. Slide wires through the back side of plug (side without any pins) and remove a small portion of the shield and out cable to access wires, but leave shield ground cable
    b. Using wire tables solder cable assembly 2 onto pins JP1-(5-7)
    c. Solder Shield ground to wire coming off of pin JP1-4
7. Check for good connections and then close the pieces of the plug together
8. Check continuity of connections using a Multimeter and going from cable ends to pin coming out of plug.
9. If continuity is good coat the end of the plug where wires enter with a generous amount of liquid electrical tape to seal any gaps and allow curing for 24 hours.
10. Repeat steps 4-9 with plug JP2 and wire assemblies 3 and 4.
11. Onto other ends of wires lay out all strain gauges near wires. Remove a small piece of cable shield and outer coating from around all wires.
12. Slide a piece of adhesive lined shrink wrap up each piece of wire so it is out of the way.
13. Solder wires to ribbon leads of strain gauges according to wire tables, ribbon leads may need to be cut shorter. Use picture steps of finished assembly as a reference.
14. Slide heat shrink wrap onto exposed wire and use heat gun to shrink the wrap down around wires. Any exposed wire should be coated in a thin amount of liquid electrical tape along with the ends of the heat shrink wrap and allowed to cure for 24 hours. Be very gentle with ribbon cables as they are fragile.
15. If a strain gauge needs to be replaced in the future it can simply be cut off around the heat shrink wrap and reordered according to wire tables.
16. Wiring assembly of strain gauges is now complete reference installation procedure to put on impeller blades.

Acceptance/Validation Criteria

1. All wiring prior to soldering of strain gauges has a low resistance (<5 ohms acceptable <1 ideal) after wires are soldered into plug.
2. All connections are waterproofed IE no exposed wire can be seen after procedure is completed.

Appendices