Technical Bulletin

Bulletin No. **010 Rev D**
Subject: **Continuity testing of EV-CAB-COM cable assembly**
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Product Applicability: **Evolution and Evolution DX2 Controllers**
Engineering Release: **R. A. Olson**
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Distribution: **APPROVED FOR GENERAL RELEASE**

1.0 Equipment required:

- Philips head screwdriver
- Nut driver, $^{11}/_{32}$
- Volt Ohm Meter, Digital or Analog
- Rain Master Manual – Evolution DX2 Installation and Assembly Drawings
- Rain Master Manual – Evolution DX2 User's Manual and Field Maintenance Guide

2.0 Reference:

Refer to FIGURE 1 below, (Evolution DX2 Installation and Assembly Drawings, DWG DXHW40A). As shown, the EV-CAB-COM assembly provides the serial communication link between the Submaster Controller and it's associated Satellites, up to 99 Satellites maximum. The cable is connected from the OUTPUT of the "First Controller" Communication Board to the INPUT of the "Second Controller" Communication Board.

NOTE: **The *copper wire* connects to the "+" terminal while the *tinned (silver) wire* connects to the "-" terminal and the *braided cable shield* connects to chassis.**

This procedure will provide guidelines to test EV-CAB-COM cables starting with the Submaster Controller to the last Satellite Controller connection.

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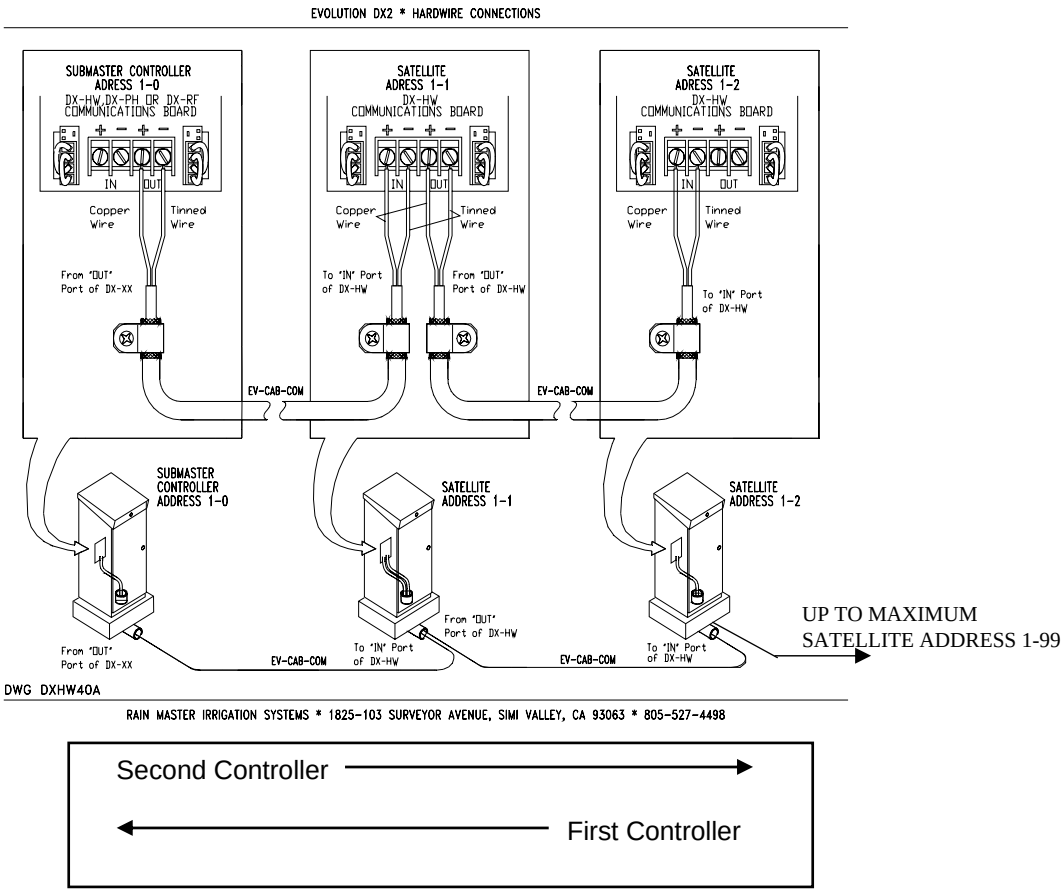
FIGURE 1



3.0 Cable testing – Setup:

To properly perform continuity checks on an installed EV-CAB-COM CABLE between two points, you must disconnect both ends of the cable from the Communication Boards (copper and tinned (silver) wires) and Controllers chassis (shield connection).

NOTE: TURN OFF THE POWER ON BOTH CONTROLLERS BEFORE REMOVING WIRES.

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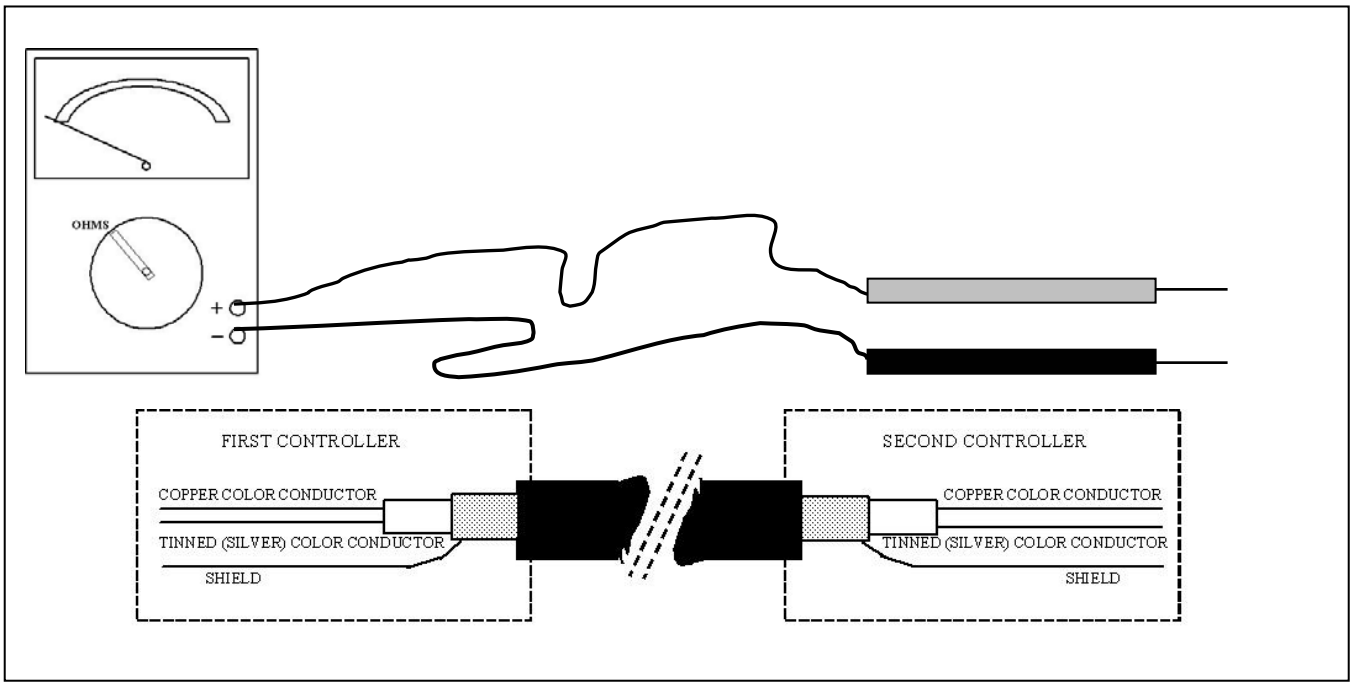
4.0 Cable testing (open condition):

These measurements assure there are no shorts between any of the three conductors. The connections will be tested as follows – Submaster to Satellite #1, Satellite #1 to Satellite #2, Satellite #2 to Satellite #3 etc., up to the last Satellite in the chain. If you are using a Digital Meter, set it to the 200-ohm scale. If you are using an Analog Meter, set it to the X10 scale. Refer to FIGURE 2.

FIGURE 2

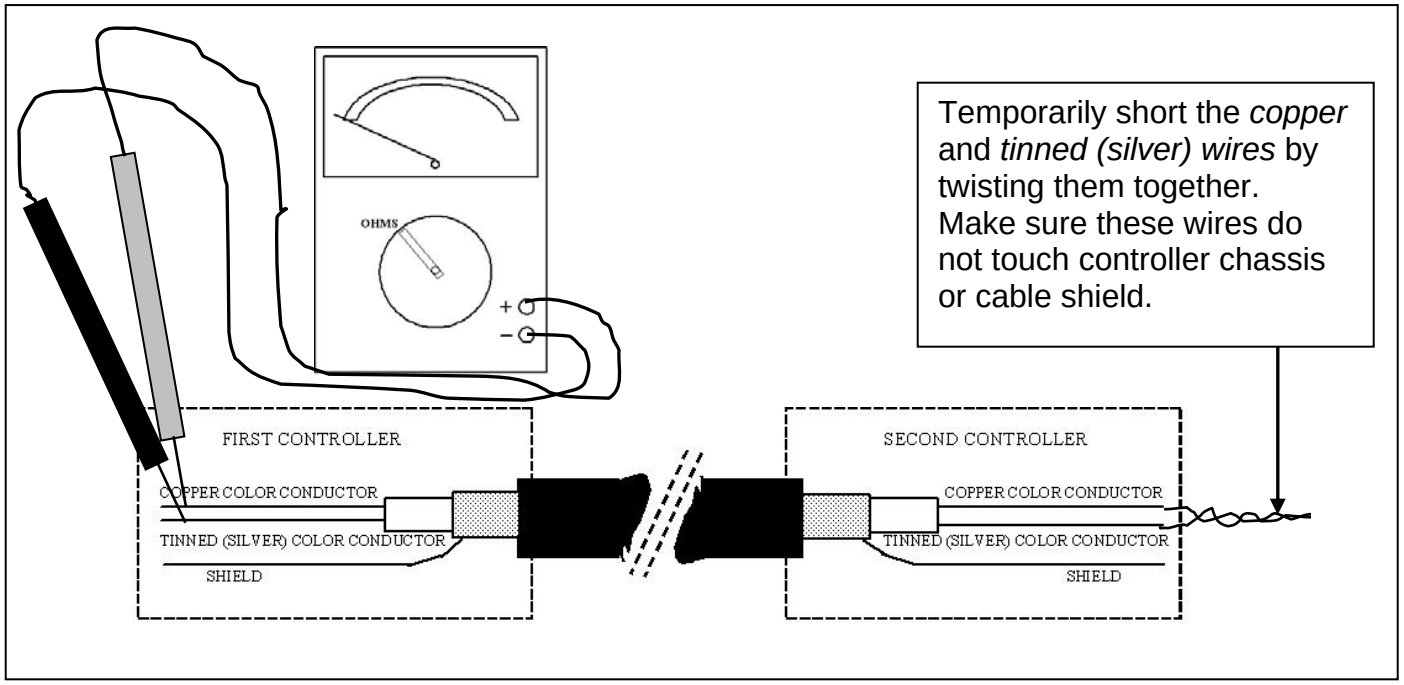


01) At the “First Controller” Submaster or Satellite - Measure continuity from the *copper wire* to the *tinned (silver) wire*, meter lead polarity is irrelevant. The meter reading should be high resistance, open condition.
02) Measure continuity from the *copper wire* to the *shield*. The meter reading should be high resistance, open condition.
03) Measure continuity from the *tinned (silver) wire* to the *shield*. The meter reading should be high resistance, open condition.
04) At the “Second Controller” Satellite – Measure continuity from the *copper wire* to the *tinned (silver) wire*. The meter reading should be high resistance, open condition.
05) Measure continuity from the *copper wire* to the *shield*. The meter reading should be high resistance, open condition.
06) Measure continuity from the *tinned (silver) wire* to the *shield*. The meter reading should be high resistance, open condition.
07) If all meter readings are satisfactory, proceed to Section 5.0. If failures occurred, make the necessary corrections before proceeding.

5.0 <u>Cable testing (shorted condition, copper and tinned (silver) wires):</u>

These measurements assure continuity from end to end of the copper and tinned (silver) wires. Refer to FIGURE 3.

FIGURE 3

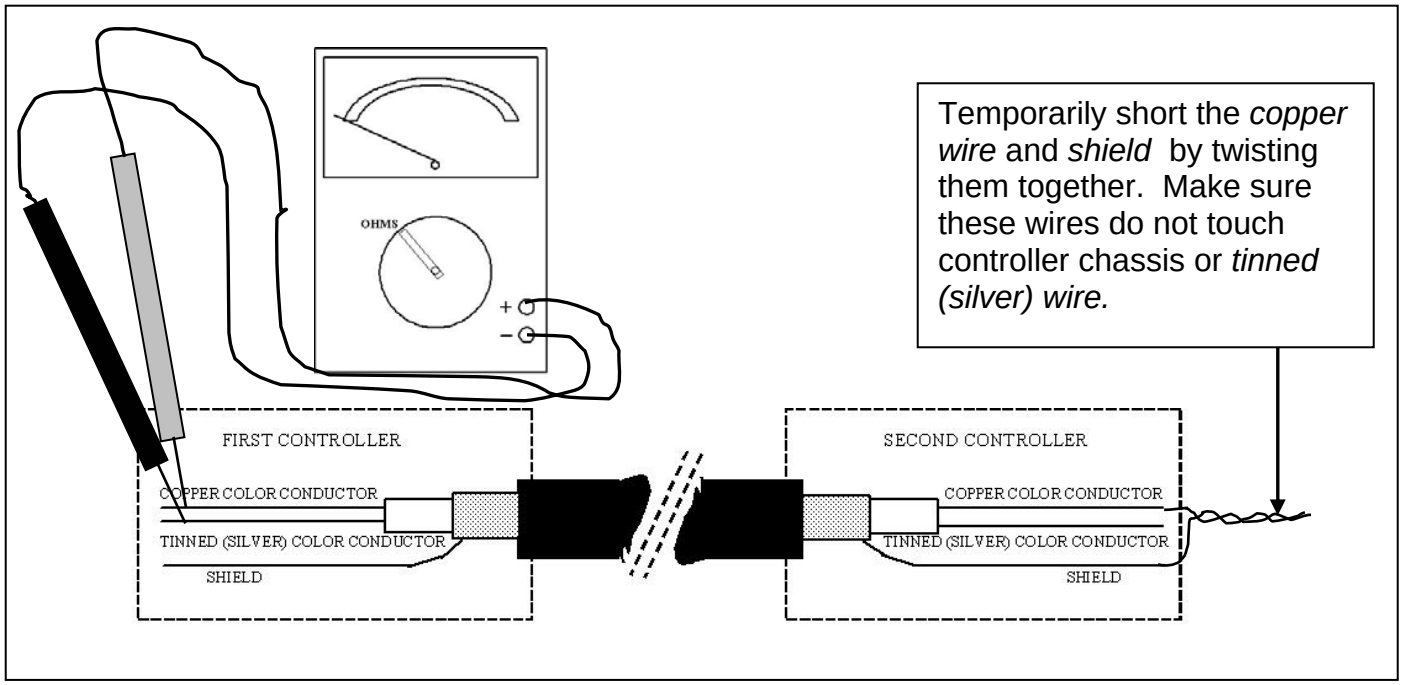


01) At the “Second Controller” Satellite – Temporarily short the *copper* and *tinned (silver) wires* by twisting them together. Make sure these wires do not touch controller chassis or cable shield.
02) At the “First Controller” Submaster or Satellite – Measure continuity from the *copper wire* to the *tinned (silver) wire*, meter lead polarity is irrelevant. The meter reading should be low resistance, shorted condition, approximately 10 Ohms/1000 feet of cable.
03) At the “First Controller” Submaster or Satellite – Measure continuity from the *copper wire* to the *shield* and from the *tinned (silver) wire* to the *shield*. The meter readings should be high resistance, open condition.
04) If all meter readings are satisfactory, remove the shorted condition between the copper and tinned (silver) wires at the “Second Controller” Satellite. If failures occurred, make the necessary corrections before proceeding.
05) Proceed to Section 6.0.

6.0 Cable testing (shorted condition, copper wire and shield):

These measurements assure continuity from end to end of the shield and confirm that any splices were made properly (i.e. – copper to copper, tinned (silver) to tinned (silver), and shield to shield). Refer to FIGURE 4.

FIGURE 4



01) At the "Second Controller" Satellite – Temporarily short the *copper wire* and *shield* by twisting them together. Make sure these wires do not touch controller chassis or *tinned (silver) wire.*
02) At the "First Controller" Submaster or Satellite – Measure continuity from the *copper wire* to the *tinned (silver) wire*, meter lead polarity is irrelevant. The meter reading should be high resistance, open condition.
03) At the "First Controller" Submaster or Satellite – Measure continuity from the *copper wire* to the *shield*. The meter readings should be low resistance, shorted condition, approximately 10 Ohms/1000 feet of cable.
04) If all meter readings are satisfactory, remove the shorted condition between the copper wire and shield at the "Second Controller" Satellite. If failures occurred, make the necessary corrections before proceeding.
05) Proceed to Section 7.0.

7.0 Continuity testing complete (restore all connections):

Once all of the above measurements have been made and all have passed, return all EV-CAB-COM connections back to their proper state as follows. Refer to FIGURE 1.

01) At the "Second Controller" Satellite – Return the *copper wire* to the "+"INPUT terminal. Return the *tinned (silver) wire* to the "-"INPUT terminal. Return the braided shield to the chassis connection.
02) At the "First Controller" Submaster or Satellite – Return the *copper wire* to the "+"OUTPUT terminal. Return the *tinned (silver) wire* to the "-"OUTPUT terminal. Return the braided shield to the chassis connection.
03) At the "First Controller" Submaster or Satellite – Switch controller power on.
04) Clear the on-line alarm (Refer to Evolution DX2 User's Manual and Field Maintenance Guide, page 10-3). The alarm should clear and no new alarms should be generated.
05) Submaster Only – Make sure the Submaster Controller is properly addressed (refer to Evolution DX2 User's Manual and Field Maintenance Guide, pages 4-43 and 4-44).
06) At the "Second Controller" Satellite – Switch controller power on.
07) Clear the on-line alarm using the same method as line item 04) above. The alarm should clear and no new alarms should be generated.
08) Satellites Only – If the Submaster is hardwired to one or more Satellites, these Satellites will be automatically assigned addresses immediately after connecting to the hardwire link.
09) Proceed to check wiring between the next two points by following Sections 3.0 through 7.0.

End of Bulletin

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