

## QUICK REFERENCE GUIDE FOR TROUBLE-SHOOTING LOOPS CONNECTED TO AUTOMATIC GATE, PARKING AND ROLL-UP DOOR OPERATORS

### Field Checklist:

- Visually examine the saw cuts (for the loop and lead-in cable). Look for pavement shifts, uncovered wire(s), small sharp fragments pressed into the saw cut, etc.
- Check the splices in the pull box or anywhere connections have been made. They must be soldered and waterproofed. IT IS EXTREMELY IMPORTANT NOT TO USE WIRE NUTS!
- ☛ Helpful tip for waterproofing connections: Take a 3" piece of PVC conduit along with a comparable size of heat-shrink tubing and slip them over the loop and/or lead-in cable. Then connect together by twisting then soldering the wires. Then slide the heat-shrink tubing over the soldered area and use low heat from a portable torch or cigarette lighter to reduce tubing and seal. Then slide the PVC conduit over the sealed heat-shrink tubing and fill the conduit with silicon rubber. Wiggle the wires slightly to remove any air holes so moisture is unable to penetrate the conduit. ***THAT'S IT!***  
***You've just taken care of the number 1 reason for intermittent and problematic loops.***
- Check the lead-in wiring (loop wires and/or lead-in cable) in the pull box. Make sure they are twisted together (5 to 6 twists per foot, minimum) and that lead-in lengths are not excessive.

### Operator / Cabinet Checklist:

- Validate the proper input voltage to the vehicle detector.
- Review the detectors diagnostics. Utilizing EDI's DEFLECTOMETER™ series vehicle detectors, if there is a current loop failure ("F" being displayed on the 7-segment LED along with the loop fault and output LED's flashing) or a previous loop fault (the detector is working normally but the loop Fault LED is flashing), the trouble is almost certainly not related to the detector. Note that the flash rate determines the type of loop fault:
  - ☛ **1 Flash = Open Loop.** An example of an OPEN LOOP fault is a break in the loop wire at any point.
  - ☛ **2 Flashes = Shorted Loop.** An example of a SHORTED LOOP fault is the lead-in (Home Run) wires shorting together, or by a short anywhere that takes the loop out of the circuit.
  - ☛ **3 Flashes = Sudden 25% Change in inductance.** An example of a 25% CHANGE IN INDUCTANCE fault is a large change of inductance on a loop, like one turn of wire shorting out. EDI's DEFLECTOMETER™ Series detectors will retune to the new loop inductance as long as the new inductance is within the detectors specified inductance range which is 20 to 2500 micro henries.
- Examine the loop and lead-in cable resistance. A value greater than 5 ohms denotes a splice or connection problem or a broken loop wire.

### Operator / Cabinet Checklist (Continued)

- Examine the frequency of the loop to make sure it is not cross-talking (interfering) with another loop. The rule of thumb is to have your loops separated by at least 5 kilohertz. You can check the frequency with EDI's DEFLECTOMETER™ series vehicle detectors or with a handheld frequency meter. Utilizing the detectors DEFLECTOMETER™ (7-segment LED), press the "RESET" button and the front panel 7-segment LED will quickly flash 2 to 3 numbers (between 13 and 150 kilohertz) before going to zero. If within 5 kilohertz, change the frequency on one of the detectors until a comfortable separation of frequencies has been achieved.
- Use a 500 VDC Megohmmeter to measure the resistance from one of the loop wires to earth ground. The reading should be greater than 50 MegOhms. If lower or grounded, separate the splice and narrow the problem to the loop or lead-in cable.
- Make sure all terminal screws are tight.
- Make sure all loop wires (inside the operator) are twisted together on the harness.
- Inspect ALL loop connections in the operator, particularly crimped lug connections. If suspicious, solder the lugs to the wire.
- If external surge or lightening suppression devices on the loop inputs are suspicious, then disconnect or replace them with new.
- Examine for places in the operator where the connecting harness wires or lead-in cable may hanging loosely, pinched or hampered with. Loose wires should be tie wrapped and secured firmly inside the operator. Pinched and hampered with wires should be repaired or replaced.

For additional assistance, please contact EDI at 480-968-6407 and ask for technical support.