

# MFL Fault Finder Operating Instructions

Part number: 790-1080

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## Background

### How Earth Return Faults Are Created

When a direct-buried cable's insulation is damaged, the conductor is exposed to contact with the earth which creates a fault. If large enough, the fault can degrade the service provided by the cable. This type of fault is called an earth return fault. These damaged areas interact with the earth which causes corrosion that can further degrade the service.

Faults can be caused by a number of actions.

- Splicing: Corroded or damaged splices may fault to ground.
- Excavation: Cables can be nicked or broken by excavation equipment such as shovel, backhoe, trencher, drill head, auger, fence post, etc. These nicked areas can fault to ground and provide a place for corrosion to start.
- Abrasion: Rocks and other abrasive elements can damage cable when the earth shifts due to soil conditions, climate and above-ground traffic.

**IMPORTANT:** Although there are other types of faults, only earth return faults can be detected with type of equipment.

### Finding General Location of a Faulted Cable

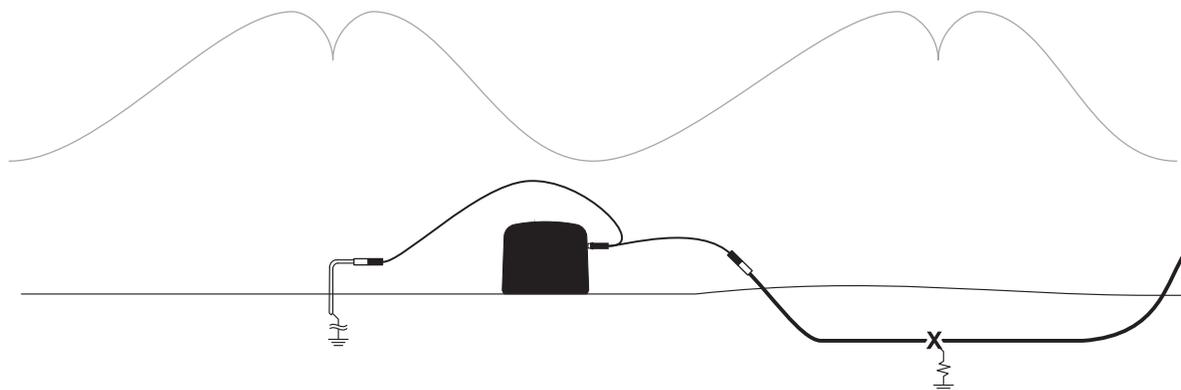
Some things to look for when searching for the general location of a faulted cable are:

- recently disturbed soil
- past splices
- "buried utility" notices
- utility facilities without overhead lines
- junction boxes
- drop boxes
- light poles
- sunken ground

## Fault Locating Concepts

Isolating the cable on both ends and then energizing it with a special signal generated by a transmitter creates an electrical circuit where current flows down the cable and seeks a path back to the transmitter. The path back to the transmitter is along the path of the fault to ground. Current will not flow without a path to ground.

Use a fault probe to probe the earth and measure the signal along the path of the cable. Signal will be highest at the point of the fault where the current enters the ground and at the transmitter ground stake. The arrows on the receiver will point toward the direction of the fault.



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As you move away from the transmitter, the receiver may stop indicating transmitter signal. As you near the fault, the receiver will resume indicating transmitter signal. This is normal. The signal will be strongest near the point of the fault (X) and at the transmitter ground. When probes straddle the fault or transmitter ground, signal will drop.

## Set Up Transmitter

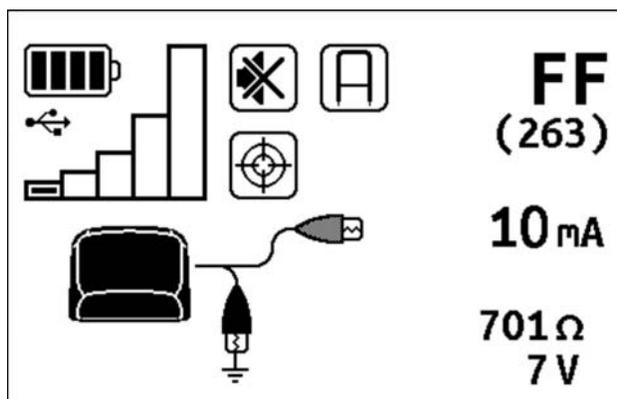
# Set Up Transmitter

### IMPORTANT:

- Fault mode is not available on 5W basic transmitters.
- Transmitter must be running Firmware Version 2 or greater.

1. De-energize and disconnect cable at both ends. Turning off a breaker is usually not enough to isolate the cable for fault finding.
2. Plug direct connect lead into transmitter.
3. Connect red lead to faulted line and black lead to ground stake.
4. Press the On/Off key to turn on transmitter.
5. Press and hold Power Level key to enter menu.
6. Navigate down to Options Menu and press Power Level key to select.
7. Navigate down to Fault Mode and press Power Level key to select. **IMPORTANT:** If direct connect leads are not plugged in, Fault Mode will not appear in the menu.
8. Select "Enabled" by pressing Power Level key.
9. Transmitter will return to main screen and be in Fault Mode.

After the transmitter is connected to the cable, the impedance reading will help verify that a fault exists on the cable. While transmitter is in Fault Mode, the screen will show current, impedance and voltage. It will also be in power level 1. If current is below 5mA, increase power level until it shows 5mA or transmitter is at highest power level.



- Readings > 100k indicate no significant fault exists in the cable.
- Readings < 50k indicate a fault is likely.
- Higher transmitter power levels give better readings. Try a higher power level to ensure the cable is faulted.

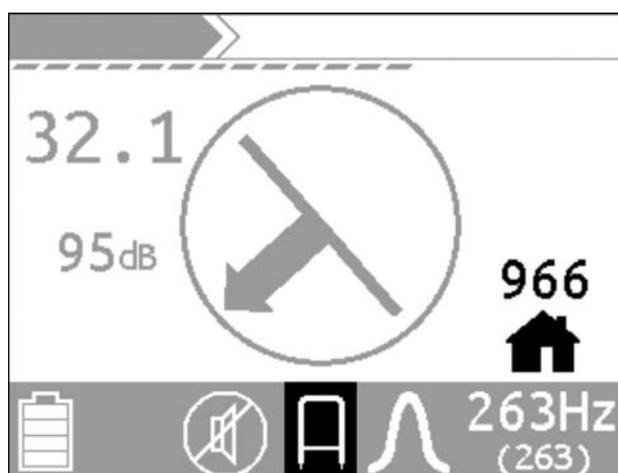
## Set Up Receiver and Fault Probe

### IMPORTANT:

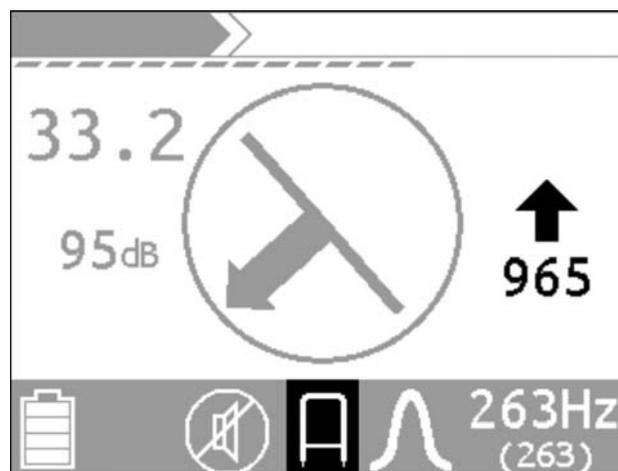
- Fault mode is not available on basic receivers.
- If receiver does not have 263Hz installed, fault finding will not work.
- Receiver must be running Firmware Version 6 or greater.
- The receiver can also locate cables while in fault mode but performance will vary based on the amount of current on the cable.

1. Press On/Off key to turn on receiver.
2. Plug fault probe into accessory port.
3. When fault probe is plugged into receiver, receiver will enter fault mode (probe icon will show) and flash a home symbol in the bottom right corner of the locate screen, as shown.
4. Connect transmitter to faulted line following transmitter setup instructions.
5. Select power level 1 or 2 on transmitter and observe adequate current on the line (ideally at least 10mA).
6. With back toward transmitter, move down faulted line a few feet from transmitter.
7. Center fault probe over the line and push it into the soil.
8. Numbers will appear above the flashing home icon. Once they do, press and hold Frequency button to home the fault system.
9. After system is successfully homed, a chime will sound and an arrow will appear, as shown. This indicates the fault is located toward the top of the screen.

**IMPORTANT:** Keep fault probe and receiver oriented the same while fault finding.



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