

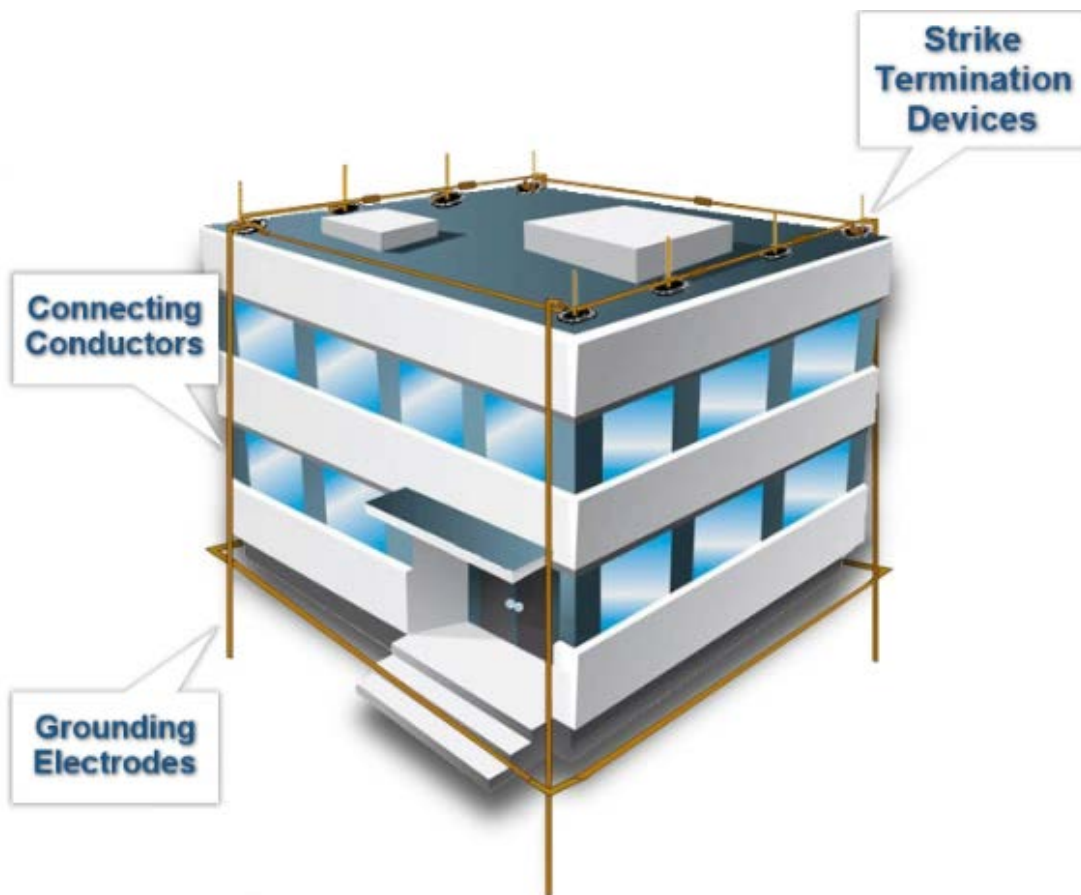
## Loop Alarm for Clamp-on Ground Testers Models 6416 and 6417

AEMC's Clamp-on Ground Resistance Testers Models 6416 and 6417 measure grounding electrode system resistance without the use of auxiliary electrodes. These instruments enable you to

- check the integrity of a grounding electrode system
- measure leakage current into the grounding system
- determine ground voltage as an indicator of a potential unsafe condition
- measure resistance, impedance, inductance, current, and voltage
- determine the bonding integrity of the grounding system
- and store test results for later review and analysis

An important feature of these instruments is loop detection. This is a condition in which the instrument's transmitted signal injected at the measurement point loops through a local conductor, rather than the earth. This can invalidate grounding system impedance measurements.

For example, consider the lightning arrestor system below. This consists of a series of strike termination devices connected to a grid or grounding ring, typically with grounding electrodes at the corners of the structure.



When you clamp the instrument around an individual grounding electrode below the grid or ring, the test current induced by the instrument passes through earth and back to the instrument by way of the other grounding electrodes. This produces a valid measurement. If instead the clamp is placed around a connecting conductor; the induced current loops through the path provided by the conductors instead of the earth. In this instance, the measurement will reflect the impedance of the conductor loop, not the earth. This latter measurement is valid only for ensuring that the metal elements of the grounding system are bonded together.

To alert the user to the potential presence of a loop measurement, the Models 6416 and 6417 display a LOOP alarm when the measured impedance falls below a pre-defined threshold. To demonstrate, we'll first measure the impedance of a typical utility pole ground wire, which as shown in the illustration below left is around 20 ohms.

Next, we'll create an electrical loop by attaching a jumper lead to the grounding cable, above and below the instrument. This reduces the impedance to below the alarm threshold. The display now alternates between the measured value and the word LOOP (see below right), alerting you of the possibility that you may be measuring the impedance through the loop created by the conductors, rather than through earth.



*Normal measurement*



*LOOP alarm displayed*

On the Model 6416, LOOP detection is always enabled, with a pre-set threshold of 1 ohm. On the Model 6417, you can change this setting through the DataView Ground Clamp-On Control Panel. To do this:

1. Turn the instrument ON and check that the Bluetooth enabled indicator appears on the LCD. If not, turn the rotary selector switch to SET-UP and press the HOLD key. Also ensure that the instrument is paired with your computer.
2. Open the Control Panel and connect to the instrument. Consult the Control Panel Help system if you need guidance for making this connection.
3. With the instrument connected, select Instrument in the menu bar and click Configure. The Instrument Configuration dialog box opens. This is the main interface for configuring the Model 6417 through the Control Panel.
4. The dialog box includes the Loop Alarm section. This includes a check box for enabling and disabling the loop alarm feature. Checking this option activates the Threshold field, allowing you to change the default setting of 1 ohm. Allowable values range from 0.1 to 199 ohms.
5. After you complete this field, click Write to Instrument to send the configuration to the Model 6417.