Instrument Resistance Spoiler (IRS2)

Model IRS2

Description

The IRS2 is designed to overcome the problem of high resistance error and tests for reference electrode contact resistance, validating the accuracy of a field reading. The IRS2 switch is a portable push button device which momentarily changes the input impedance of the digital multimeter. This feature permits the Corrosion Technician to detect high resistance in the external circuit, such as faulty test lead connections or high resistance contact between a reference electrode and the electrolyte.

The “normally-open” switch means the IRS2 can be left plugged-in without changing the meter's characteristics, but reduces meter input resistance significantly when the push button is depressed. If there is ±5% (or more) difference in the displayed reading, then there is a contact resistance error that requires correction.

Using the IRS2 during potential surveys enhances performance by reducing the number of inaccurate readings. True potential values may be calculated in areas with very dry, frozen, or high resistivity soil.

Features & Benefits

+ Designed to overcome the problem of high resistance reading errors.
+ Method to validate the accuracy of field readings.
+ Quick and convenient to use with no special adapters or tools required.
+ Inexpensive solution for peace of mind while performing potential surveys.
+ No special training required.
+ Designed for use when soils are dry or frozen.
+ Saves time and money by eliminating repeating site visits to look for favourable soil contact resistance.

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INSTRUCTIONS

Step 1	Without pushing the button on the IRS2, record the potential (V_{meter})
Step 2	Push and hold the button on the IRS2, and record the potential ($V_{spoiled}$)
Step 3	Calculate $\Delta V = V_{meter} - V_{spoiled}$ if $\Delta V = > 0.05 \times V_{meter}$ then there is a contact resistance error that requires correcting
Step 4	Calculate the true potential (V_{true}) as follows; $V_{true} = \dfrac{V_{meter}[1-K]}{1-K \cdot \dfrac{V_{meter}}{V_{spoiled}}}$ For instance: If V_{meter} is 800 mV & $V_{spoiled}$ is 500 mV and R_{meter} = 10 MΩ and $R_{spoiler}$ = 1 MΩ then V_{true} is 851 mV Where: K = spoiler ratio = R_l / R_h R_l = lowest input resistance = $\dfrac{R_{meter} \cdot R_{spoiler}}{R_{meter} + R_{spoiler}}$ R_h = highest input resistance = R_{meter} typically 10 MΩ or 20 MΩ

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