

Calibrating Impedance Meters Using Resistance Standards

One of the tasks that eventually faces users of impedance meters and digibridges is the periodic calibration and certification required (usually on an annual schedule). Removing a test instrument from a manufacturing environment can be disruptive and costly. The best alternative is a simple, low cost, and traceable calibration kit for QuadTech instruments that can be utilized at the user's site. This will prevent returning the instrument to the manufacturer or to a certified calibration facility that often requires that the instrument be out of operation for an extended period.

Why Use Resistance Standards?

QuadTech makes available a calibration kit for its line of 7000 Series Meters (Part # 7000-09) and a kit for its Digibridge line (Part # 1689-9604). Each kit consists of 6 calibration standards: an Open, a Short, and four precision resistors. The resistors in each calibration kit are calibrated for both known values of resistance and Q at 1kHz for the 1689-9604 and additional frequencies of 25kHz, 50kHz, 250kHz, 500kHz and 1MHz for the 7000-09. The standard resistors are chosen for several reasons:

- ❑ Compatibility
- ❑ Wide Impedance Range
- ❑ NIST Traceable
- ❑ Constant with Frequency
- ❑ Compact and Inexpensive
- ❑ Automated Procedures

Compatibility: The values of these standards are nearly identical (in value and stability) to the internal standards used in the QuadTech impedance meters. Some meters use capacitance standards, but remember it really doesn't make much difference, impedance parameters are all related mathematically.

Wide Impedance Range: Impedance meters today continue to be designed to cover wider and wider measurement ranges of impedance. Standard values of resistors are readily available to fit these wider ranges, whereas for a number of practical reasons capacitors find themselves range limited.

NIST Traceable: The National Institute of Standards and Technology readily provides calibration of resistors, and at higher frequencies than other components.

Calibration Standards Features (Continued)

Constant with Frequency: Standard resistors are constant and predictable over wide frequency ranges, whereas capacitors readily change with frequency.

Compact and Inexpensive: Resistors are small, rugged, inexpensive, and good when compared to components such as standard air capacitors. These factors are what make an economically priced set of field portable calibration standards feasible for fast on-site calibration.

Automated Procedures: In many cases, as with the 7000 Series Meter calibration kit, the user is prompted with instructions on the instrument display. This makes the process easy, fast, and error free.

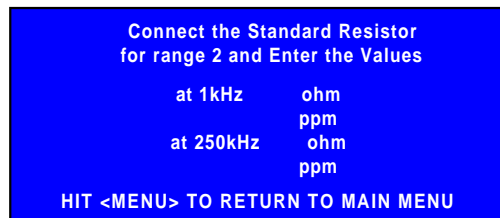


Figure 1: 7000 Series Instrument Display: Automated Calibration



Figure 2: QuadTech 7000-09 Calibration Kit

For complete product specifications on the 7000 Series Precision LCR meters or any of QuadTech's products, visit us at <http://www.quadtech.com/resources/dataindex.html>. Do you have an application specific testing need? Call us at 1-800-253-1230 or email engineering at rroetzer@quadtech.com and we'll work with you on a custom solution. Put QuadTech to the test because we're committed to solving your testing requirements.

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