

System Certification/Calibration Strategy  
Richard Davis  
Waters Corp.

### Certification

The test system will require annual Certification. The Certification process involves measuring the accuracy of the instruments and requires an instrument calibrated to traceable standards. Certification requirements for any or all the instruments may be based on our requirements and not the instruments published specifications. Only the instruments requiring traceability require Certification.

### Instruments Requiring Traceability

1. DMM
2. Scope
3. Function Generator
4. Programmable Power Supplies (6)
5. Electronic Loads
6. PXI SMU
7. PXI DAQ cards
8. PXI Programmable Resistors

### Calibration

Only instruments that fail Certification require calibration. Calibration of bench top instruments can be performed quickly and economically on-site using local calibration service providers. Calibration of PXI instruments becomes problematic because of limited access (special cables and/or fixtures) and the complexity of the software environment. PXI instruments should probably be sent back to the OEM if calibration is required.

### Self Test

System Self Test will be provided to ensure all system components/instruments are functioning and connected to the receiver. The Self Test fixture uses system instruments to check other system instruments in a loopback mode. It is not intended to provide certification or traceability.

If we can all agree on the above Certification/Calibration process then I can foresee adopting one of the 3 calibration strategies below. One problem with Strategies 2 & 3 is getting Ray to buy in and agree on a set of specifications.

### Strategy 1

Once a year, have a calibration service provider come in and calibrate as much of the system as they can. Send all instruments they can't calibrate on-site out for calibration. This strategy is currently implemented on the Racal test system. This will not require a fixture or software development.

### Strategy 2

Put a calibration standard in the PXI chassis and develop a Certification Fixture with our own software. This will allow us to completely automate the certification process using our own specifications. The calibration standard will not be cheap but long term will reduce the cost and minimize tester downtime. The only annual calibration required will be the PXI calibration standard itself and the tester can still be used while the calibration standard is out being calibrated.

### Strategy 3

Once per year have the DMM, the Function Generator, and the PXI-SMU calibrated to published specifications. Then use these devices to certify all the other instruments that require certification. In this scenario the DMM, Function Generator and SMU take the place of the PXI calibration standard used in Strategy 2. A fixture will have to be developed as in Strategy 2 and the certification process can be automated and utilize our own specifications.