

Why calibrate your test and measurement equipment?

Test and Measurement Equipment (TME) performs a critical role in product and services conformance testing to allow you to invoice your customers. You rely on your equipment to commission or fault find networks and the results obtained are important in guiding outcomes. Many organisations do not understand the value and importance of regular calibration and servicing activities on TME.

Important Questions:

- *Can the results obtained be relied on?*
- *Are the results accurate?*
- *What would be the impact if you approved incorrect results?*
- *How important are the results you obtain from your test equipment?*
- *Does your customer expect you to provide certified calibration proof of TME used?*

How could calibration benefit your organisation?

- *Reduced down time*
- *Reduced rework*
- *Improved company reputation (Quality accreditation)*
- *Increased workforce efficiency*

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The correct operation of Test and Measurement Equipment (TME) is a major contributor to the accuracy and reliability of measurements performed to determine network performance. The extent to which formal calibration needs be applied on TME is dependent on the application. For those organisations undertaking work that requires accurate measurements on which the end product quality is dependent, formal and fully traceable calibration needs to be completed.

There are however, many applications where verification of product conformance or process control requirements do not require such high accuracy or traceable measurements.

What is Calibration?

> *"The application of specifically known and accurately measured input to ensure that an item will produce a specifically known output which is accurately measured or indicated. Calibration includes adjustment or recording of corrections as appropriate".* [1]

To determine if TME needs traceable calibration these questions need to be asked:

a) Identify which measurements are critical to ensuring end product conformance and performance. These measurements may include physical measurements of the product or service (e.g. resistance, length, volts, etc), or values of specified performance parameters (e.g. Bite Error Rate, insertion loss, gain, etc), and process control parameters that are critical to ensuring final product or service quality.

b) Identify the tolerance & accuracy required for these measurements.

c) Identify the correct test and measurement equipment to perform the task and determine the extent/frequency of calibration required.

What is Traceability?

The concept of traceability has two aspects.

(1) Traceability of the measurement instrument chain - means that the customer's instrument must be calibrated against a reference instrument that has been calibrated against a more accurate reference instrument and so on until the calibration chain reaches the primary national and international standards. The primary standards in Australia are held by the National Measurement Institute (NMI)



(2) Traceability of competence (accredited skill of calibration personnel) - means that the personnel performing the calibration procedure and signing the test reports and calibration certificates have been trained to perform this task and have been assessed as competent at doing so by the equipment manufacturer or a testing authority such as NATA (National Association of Testing Authorities-Australia)

Calibration Intervals

'How often do I need my instrument calibrated?' The answer is not simple and depends on factors such as: the impact of the instrument on quality of the end product; the environment and the way in which the instrument is used and recorded history of the instrument. Ultimately it comes down to the risk period that, should the equipment become faulty, the company is prepared to continue delivering products and services.
Manufacturers often recommend calibration intervals for their instruments models. These recommendations are based on their knowledge of the design of the instrument and the performance history of a number of the same instruments over a period of time.

So how can you reduce your calibration costs?

1. Identify what does and what does not need calibration
2. Obtain advice on whether traceable calibration or verification should be performed
3. Check with the manufacturer as to the recommended calibration cycle
4. Only purchase equipment that can be calibrated locally to prevent extra cost in international freight costs and delays
5. Regular servicing reduces repairs cost by preventing possible problems and costly repairs

For more detailed advice as to your specific calibration requirements please do not hesitate to call Celemetrix on 1800 256 838.

[1] Australian Government Civil Aviation Safety Authority (CASA) 2004