

The 3000 series calibrators can be calibrated and adjusted by any competent laboratory with measurement capabilities and suitable uncertainties to cover the ranges and outputs of the 3000 Series calibrators.

### Equipment Required

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- **Precision 8 ½ Digital Multimeter.**  
E.g. Hewlett Packard HP3458A or Wavetek 1281.
- **Capacitance / Inductance bridge.**  
E.g. Wayne Kerr B905.
- **Frequency counter.**
- **Shunt resistors for measurement of 2A and 30A.**
- **Low thermal test leads with 4mm plug terminations.**
- **Shrouded test leads suitable for 1000V AC measurements.**
- **1m BNC to BNC cable with 2off BNC to 4mm adapters.**
- **RS232 cable.**

The calibration and adjustment process should only be undertaken by personnel and facilities with the ability to perform precision measurements and have complete understanding of uncertainties and sources of errors, e.g. lead effects, thermals and noise associated with low level measurements.

Also important is the correct use of test equipment, including any special configurations and complete familiarity with functions and range of the 3000 Series calibrators.

### Important Safety Note :

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The 3000 series calibrators generate high voltage outputs and present a risk of electric shock. Follow all safety precautions as per operation manual when using the calibrator. The calibrator should only be operated, calibrated and adjusted by competent individuals.

### Verification Sheets

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Verification sheets detailing a full listing of test points and specified accuracies can be downloaded from [www.transmille.com](http://www.transmille.com). The verification sheets also cover the options available for the calibrators which may be fitted. These can be used as a basis for manual calibration working through the list of test points, setting the calibrator manually via the front panel and recording the readings in the boxes provided on the printout.

Alternatively the calibrators may be returned to Transmille for full calibration and adjustment services.

Adjustment of the 3000 Series calibrators is a straightforward process, and is firmware / software controlled employing electronic calibration constants, or cal factors, stored in non-volatile RAM. This enables adjustment to be performed without opening the instrument enclosure.

To adjust the calibrators, three methods are available :

1. Direct front panel control  
90% of the adjustment points can be calibrated directly from the calibrator front panel.  
See the 3000 Series Operation Manual 'calibration' chapter for more information.
2. Virtual Front Panel Software control (Cost Option)  
Using the optional 3000 Series Virtual Front panel software running on a Windows PC and Serial / USB connection, full control of every adjustment point is available. This software provides remote manual operation of the 3000 Series calibrator outputs and functions and manual setting of calibration factors on a range by range basis.  
  
See [www.transmille.com](http://www.transmille.com) for full details on the 3000 Series Virtual Front Panel.
3. ProCal Calibration Software Closed Loop Automated Calibration (Cost Option)  
Transmille's ProCal calibration software, together with the appropriate closed loop calibration procedure can be used to automate calibration of the 3000 Series calibrators. This takes the necessary readings and performs adjustments automatically, automating the process of calibration and adjustment for almost all test points<sup>1</sup>.

<sup>1</sup> Please note for a small number of setting the virtual front panel software must be used.

See [www.transmille.com](http://www.transmille.com) for full details on ProCal software.