



SETTING THE STANDARDS IN CALIBRATION

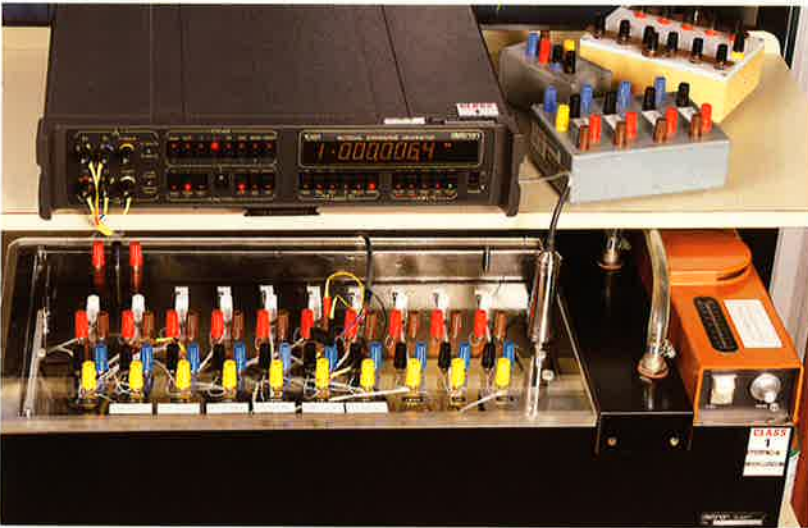
datron
INSTRUMENTS



Datron Instruments Limited
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AC Voltage Traceability is provided by the combination of well proven Thermal Converters and 'state of the art' techniques in their use. Such a combination gives the very best performance over a wide range of Voltages and Frequencies.



Resistance and AC/DC Current are well provided for by the use of the very best AC/DC Resistance Standards maintained in flowing oil.

Front cover: Shows the calibration of a Datron Autocal 4700 Multifunction Calibrator against a Datron 4900 DC Calibration System. This system, combined with our Metrology expertise, is the key to Datron's exceptional DC Voltage capability.

DATRON'S COMPLETE CALIBRATION SERVICE

Modern high accuracy instruments demand the very best Standards and Measurement support if they are to realise their full potential accuracy and performance.

The provision and maintenance of a Standards and Calibration facility can be very costly – particularly in relation to the cost of the instruments that will be calibrated within it. Yet this support must be provided if the instrument user is to have absolute confidence in the accuracy of his equipment and integrity of the measurements made. Clearly a cost effective solution to this problem is required – such as that provided by the BCS Accredited Standards Laboratory of Datron Instruments Ltd.

Datron's Laboratory Standards are directly Traceable to National Standards maintained at the National Physical Laboratory. As a result of our close liaison with the NPL we are able to offer excellent uncertainties over a wide range of measurement parameters. Details of our BCS Grant of Accreditation may be found on the enclosed sheets.

A range of calibration options can be offered, with either a BCS or Datron Certificate of Calibration. In addition, arrangements can be made, on an individual basis, to accommodate special customer requirements – including forward planning of calibration.

With Datron Instruments, you can be confident that the full support of Datron's Manufacturing and Servicing resources is available in order to minimise the cost of ownership and down-time of your valuable investment.



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Measured quantities for which BCS
 Approval has been granted

Approved Signatories
 Head of Laboratory: Mr P.B. Crisp
 Deputy: Mr D. Cooper
 Mr N. Brackenbury

Nominal Temperature for Calibration: 23°C

| MEASURED QUANTITY AND RANGE OR INSTRUMENT | FREQUENCY | BEST MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)* | REMARKS |
|---|-----------|--|--|
| DC RESISTANCE | | | |
| Specific values | | | |
| 1 Ω | } | 4 ppm | Measurement of resistors with negligible power dissipation |
| 10 Ω | | | |
| 100 Ω | | 1.6 ppm | |
| 1 k Ω | | | |
| 10 k Ω | | 2 ppm | |
| 100 k Ω | | | |
| 1 M Ω | | 5 ppm | |
| 10 M Ω | | | |
| 100 M Ω | | 8 ppm | |
| | | | |
| | 15 ppm | | |
| | | | |
| | 50 ppm | | |
| | | | |
| | } | 1 ppm | Appropriate to the calibration of resistance measuring instruments. See Note 1 |
| 1 Ω | | | |
| 10 Ω | | | |
| 100 Ω | | | |
| 1 k Ω | | | |
| 10 k Ω | | | |
| 100 k Ω | 4 ppm | | |
| 1 M Ω | | | |
| 10 M Ω | 7 ppm | | |
| 100 M Ω | | | |
| | 13 ppm | | |
| | | | |
| | 20 ppm | | |
| | | | |
| DC VOLTAGE | | | |
| Standard Cell Values | | 1.2 μ V | Stated uncertainties can be realised with cells only if they have their own temperature controlled enclosure of appropriate thermal stability |
| | | | |
| 10.18 V | } | 1.2 ppm | The uncertainties are available at specific voltages which are multiples of 1.018 from: 1 V to 10V at 1V intervals 10V to 100V at 10V intervals 100V to 1kV at 100V intervals for the calibration of instruments |
| up to 2 V | | | |
| 1 V to 1 kV | | 1.2 ppm + 30 nV | |
| | | | |
| | } | 1.6 ppm | |
| | | | |
| | } | 2.5 ppm | |
| 2 V to 1000 V | | | |
| 1000 V to 1200 V | | 2.7 ppm | |
| DC CURRENT | | | |
| 10 μ A to 100 mA | | 3 ppm | |
| 100 mA to 2 A | | 11 ppm | |

*THE UNCERTAINTIES ARE BASED ON AN ARITHMETIC SUMMATION OF THE CONTRIBUTIONS



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British Calibration Service
 Appendix A
 Accreditation No: 0183
 Page 2 of 3
 Measured quantities for which BCS
 Approval has been granted

**STANDARDS LABORATORY
 DATRON INSTRUMENTS LIMITED**

Approved Signatories
 Head of Laboratory: Mr P.B. Crisp
 Deputy: Mr D. Cooper
 Mr N. Brackenbury

Nominal Temperature for Calibration: 23°C

| MEASURED QUANTITY AND RANGE OR INSTRUMENT | FREQUENCY | BEST MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)* | REMARKS | |
|---|---------------------|--|---|--------|
| AC VOLTAGE | | | | |
| 1 mV to 1 V | 20 Hz to 20 kHz | 0.012% |] Appropriate to the calibration of voltage measuring instruments | |
| 1 mV to 1 V | 20 kHz to 50 kHz | 0.02% | | |
| 1 mV to 1 V | 50 kHz to 100 kHz | 0.04% | | |
| 1 V | 20 Hz to 100 Hz | 50 ppm |] Specific values are those which fall within ± 10% of stated value. Appropriate to the calibration of AC Voltage sources | |
| 1 V | 100 Hz to 10 kHz | 40 ppm | | |
| 1 V | 10 kHz to 30 kHz | 50 ppm | | |
| 1 V | 30 kHz to 100 kHz | 70 ppm | | |
| 1 V | 100 kHz to 500 kHz | 0.025% | | |
| 1 V | 500 kHz to 1 MHz | 0.06% | | |
| 10 V | 20 Hz to 100 Hz | 50 ppm | | |
| 10 V | 100 Hz to 10 kHz | 40 ppm | | |
| 10 V | 10 kHz to 30 kHz | 50 ppm | | |
| 10 V | 30 kHz to 100 kHz | 70 ppm | | |
| 10 V | 100 kHz to 500 kHz | 0.025% | | |
| 10 V | 500 kHz to 1 MHz | 0.065% | | |
| 100 V | 20 Hz to 100 Hz | 45 ppm |] Other voltages up to 1100 V can be measured with an increased uncertainty. | |
| 100 V | 100 Hz to 10 kHz | 35 ppm | | |
| 100 V | 10 kHz to 50 kHz | 45 ppm | | |
| 100 V | 50 kHz to 100 kHz | 65 ppm | | |
| 1 kV | 20 Hz to 100 Hz |] 70 ppm | | |
| 1 kV | 100 Hz to 1 kHz | | | |
| 1 kV | 1 kHz to 10 kHz | | | |
| 1 kV | 10 kHz to 30 kHz | | | 0.015% |
| 1 kV | 30 kHz to 50 kHz | | | 0.025% |
| 1 kV | 50 kHz to 100 kHz | 0.055% | | |
| AC CURRENT | | | | |
| 10 µA to 100 mA | 20 Hz to 50 Hz | 0.012% |] Appropriate to the calibration of AC Current Sources | |
| | 50 Hz to 5 kHz | 0.01% | | |
| 100 mA to 2 A | 20 Hz to 100 Hz |] 0.02% | | |
| | 1.592 kHz to 5 kHz | | | |
| 100 mA to 2 A | 100 Hz to 1.592 kHz | 0.01% | | |
| FREQUENCY | | | | |
| Specific Values | 1 MHz , 10 MHz | 0.02 ppm |] Appropriate to the calibration of Frequency measuring instruments | |
| Other Values | 10 Hz to 10 MHz | 0.5 ppm + 0.1 Hz | | |



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 Appendix A
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 Approval has been granted

Approved Signatories
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 Deputy: Mr D. Cooper
 Mr N. Brackenbury

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|---|-----------|--|---------|
| INSTRUMENTS | | | |
| <p>The following types of instruments can be calibrated in accordance with the scheduled measured quantities and ranges. An uncertainty reported on a BCS Certificate will be that for the instrument itself during calibration plus the appropriate measurement capability of the laboratory for the quantities and ranges concerned. Specifically, calibration products manufactured or marketed by Datron Instruments Ltd.</p> | | | |
| <p>Calibrators: voltage: dc, ac current: dc, ac resistance: dc</p> <p>Multi-range meters digital: voltage: dc, ac current: dc, ac resistance: dc</p> <p>Voltage dividers and volt-ratio boxes</p> | | | |
| <p>NOTE 1 The uncertainty quoted on a BCS certificate will be that for the standard resistor itself plus any uncertainties attributable to the instrument during calibration.</p> | | | |
| | | | |



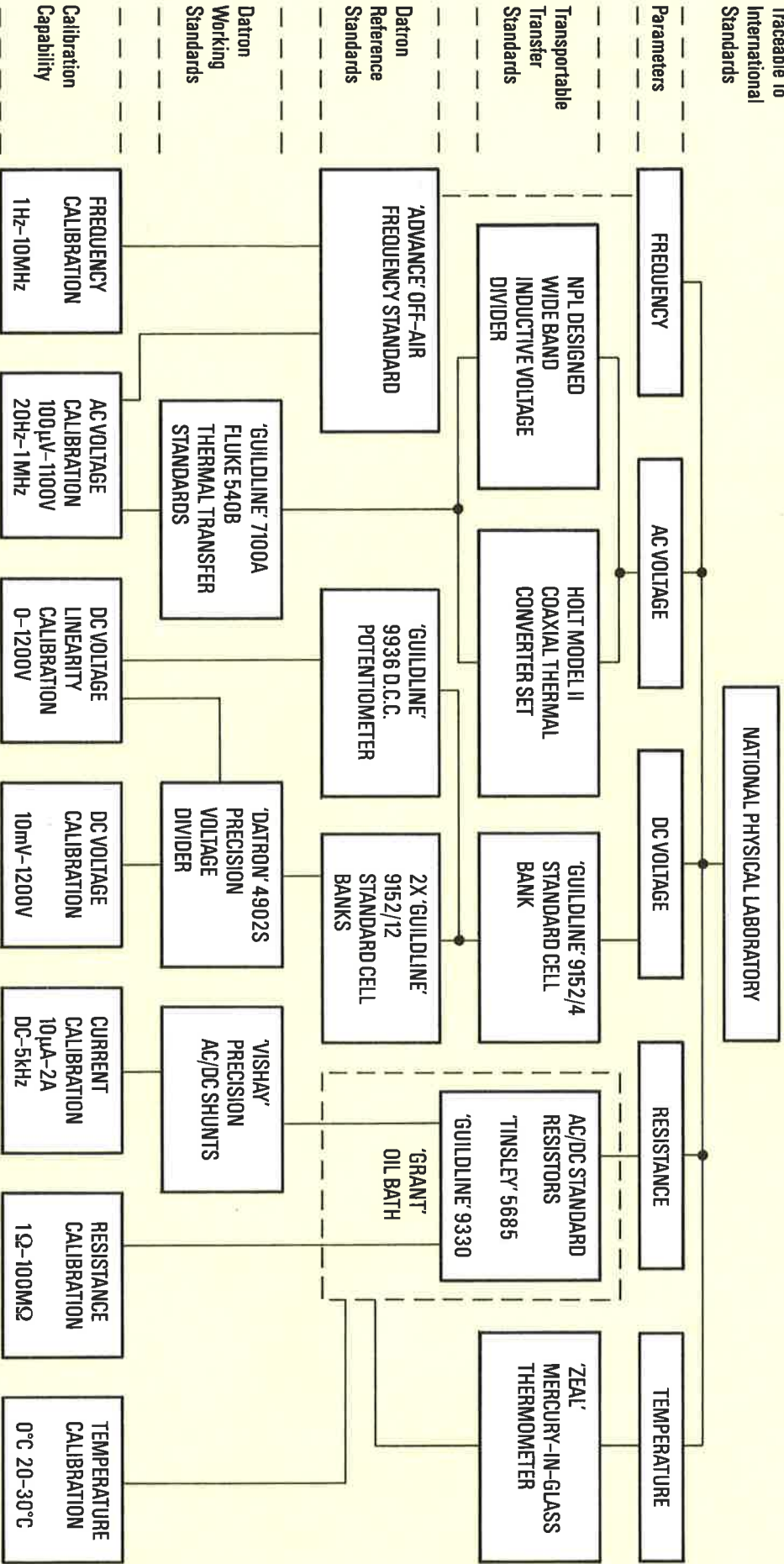
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STANDARDS LABORATORY - TRACEABILITY CHART

National Standards
Traceable To
International
Standards



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