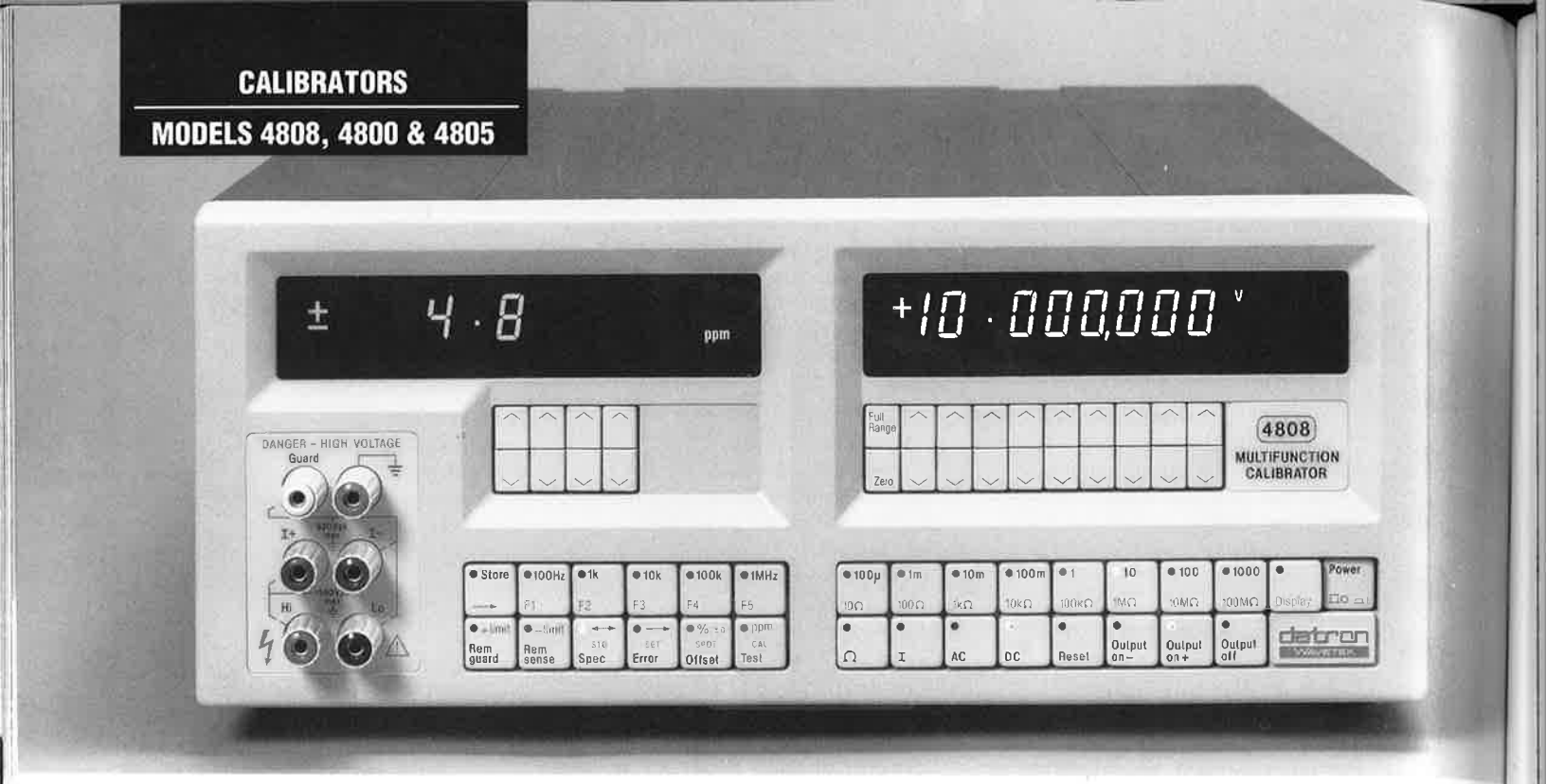


Multifunction DMM Calibrators

- **DCV, ACV, DCI, ACI and Ω Functions**
- **True 1kV AC Performance from a Single Unit**
- **4808 for Ultimate in Standards Laboratory Performance**
- **4800 for Meter Calibration to 7½ Digit Accuracy**
- **4805 for Meter Calibration to 5½ Digit Accuracy**

Used either as a component in an automated calibration system or as a standalone bench instrument, the Datron range of Multifunction calibrators offers the most cost-effective solution to today's calibration problems. Initial purchase costs are reduced by the inclusion of a full capability 1000V DC and AC power amplifier in the calibrator chassis, enabling a single unit to cover the widest possible calibration workload. The options available on the 4808 and 4800 allow an instrument to be configured as DCV only, ACV only, or multifunction, enabling configuration of a calibrator that meets today's requirements while retaining the flexibility to upgrade capabilities as requirements change.

Calibration Support

The 4808, 4800 and 4805 are designed to be supported by the 4950 Multifunction Transfer Standard. This allows fully traceable calibration support to be achieved on site, eliminating the downtime normally associated with transportation of the calibrator to a Standards laboratory. This calibration process may be totally automated, making it much faster, more repeatable and less dependant on skilled labor than the traditional, manual approach. For further information, refer to the section covering the model 4950.

Flexibility and Ease of Use

All models contain an IEEE-488 interface as standard, enabling the calibrator to form the heart of a compact and highly accurate calibration or test system, while its rugged construction and insensitivity to temperature variations make it ideal for applications outside of the traditional calibration environment. It is compatible with the Datron Portocal Multimeter Calibration software package, a combination which forms an automated calibration system capable of calibrating any DMM. Portocal can also be expanded to other type of instrumentation, such as oscilloscopes, signal generators etc.

When used as a standalone bench operated calibrator, each 4808, 4800 and 4805 offers ease of use, high reliability, higher performance and unique functionality. All three models share the same easy-to-use front panel interface that uses high brightness seven segment vacuum flourescent displays and ergonomically designed keyboard using pushbuttons designed to give a high level of tactile feedback. Designed with operator safety in mind, specially designed safety terminals guard against accidental contact with live parts. Selection of potentially lethal output voltages requires a fixed sequence of keystrokes, and is accompanied by a continuous, audible alarm for as long as dangerous voltages are present at the output terminals.

4808 SPECIFICATIONS

DC Voltage (Option 10)

Ranges: 100 µV to 1000V in decades.
Resolution: 7 1/2 digits or 10 nV, whichever is greater.
Accuracy: 90 days, 23°C ±1°C: ±(ppm Output + ppmFS) (FS = 2 X Range)

100 µV to 100 mV Ranges:	3 + 0.4 µV
1V Range:	2 + 0.4
10V Range:	1 + 0.15
100V Range:	2 + 0.25
1000V Range (requires Option 30):	3 + 0.25

Output Impedance/Max Output Current:
100 µV to 100 mV Ranges: 100Ω.
1V to 1000V Ranges: 25 mA max.

AC Voltage (Option 20)

Ranges: 1 mV to 1000V in decades.
Resolution: 6 1/2 digits or 100 nV, whichever is greater.
Frequency: Ranges: 10 Hz to 1 MHz. Resolution: 1% of setting or 1Hz. Accuracy: <±100 ppm.
Maximum Capacitive load: 1000 pF on 1V to 100V ranges, 300 pF on 1000V range.
Accuracy: 90 days, 23°C ± 1°C: ±(ppm Output + ppmFS) (FS = 2 X Range)

1 mV to 100 mV Ranges

110 + 20 + 5 µV:	(10 - 31 Hz)
60 + 20 + 5 µV:	(32 - 330 Hz)
50 + 20 + 5 µV:	(300 Hz - 10 kHz)
60 + 20 + 5 µV:	(10k - 33 kHz)
250 + 20 + 5 µV:	(30k - 100 kHz)
750 + 50 + 10 µV:	(100k - 330 kHz)
1550 + 500 + 20 µV:	(300k - 1 MHz)

1V and 10V Ranges

80 + 15:	(10 - 31 Hz)
40 + 10:	(32 - 330 Hz)
30 + 5:	(300 Hz - 33 kHz)
60 + 10:	(30k - 100 kHz)
180 + 50:	(100k - 330 kHz)
1100 + 200:	(300k - 1 MHz)

100V Range

90 + 15:	(10 - 31 Hz)
50 + 10:	(32 - 330 Hz)
40 + 5:	(300 Hz - 10 kHz)
50 + 10:	(10k - 33k Hz)
90 + 15:	(30k - 100 kHz)
530 + 150:	(100k - 330 kHz)
7700 + 600:	(300k - 1MHz)

1000V Range (reqs. Opt 30)

130 + 10:	(10 - 330 Hz)
90 + 10:	(300Hz - 10 kHz)
130 + 10:	(10k - 33 kHz)
750 + 20:	(to 750V max, 30k - 100 kHz)

Output Impedance / Max Current:

1mV to 100mV ranges:	30Ω.
1V range:	50mA rms.
10V range:	60mA rms.
100V range:	120mA rms.
1000V range, <3kHz:	15mA rms.
1000V range, >3kHz:	65mA rms.

DC Current (Option 40)

Ranges: 100 µA to 10A in decades.
Resolution: 6 1/2 digits or 100 pA, whichever is greater.
Accuracy: 90 days, 23°C ± 1°C: ±(ppm Output + ppmFS) (FS = 2 X Range)

100 µA Range:	50 + 10
1 mA Range:	20 + 5
10 mA Range:	20 + 5
100 mA Range:	20 + 5
1A Range:	50 + 10
10A Range (Requires Opt. 60):	50 + 25

AC Current (Option 40)

Ranges: 100 mA to 10A in decades.
Resolution: 6 1/2 digits or 100 pA, whichever is greater.
Accuracy: 90 days, 23°C ± 1°C: ±(ppm Output + ppmFS) (FS = 2 X Range)

100 µA Range

120 + 30:	(10 Hz - 1 kHz)
250 + 40:	(1 k - 5 kHz)

1 mA, 10mA & 100mA Ranges

70 + 30:	(10 Hz - 1 kHz)
120 + 30:	(1k - 5 kHz)

1A Range

250 + 30:	(10 Hz - 1 kHz)
400 + 40:	(1k - 5 kHz)

10A Range (Reqs Opt. 60):

300 + 60:	(10 Hz - 1 kHz)
750 + 75:	(1k - 5 kHz)
1500 + 300:	(5k - 10kHz)
5400 + 1600:	(10k - 20kHz)

Resistance (Option 50)

Ranges: 10Ω to 100 MΩ in decades. (Ranges are nominal, actual calibrated values are displayed).
Connections: Selectable 2 or 4-wire, remote/local guard.
Display Resolution: 7 1/2 digits
Accuracy: 90 days, 23°C ± 1°C: ±(ppm Output):

10Ω:	10
100Ω, 1 kΩ, 10 kΩ, 100 kΩ:	3
1 MΩ:	10
10 MΩ:	25
100 MΩ:	30

4800 SPECIFICATIONS

DC Voltage (Option 10)

Ranges: 100 µV to 1000V in decades.
Resolution: 7 1/2 digits or 10 nV, whichever is greater.
Accuracy: 90 days, 23°C ±1°C: ±(ppm Output + ppmFS) (FS = 2 X Range)

100 µV to 100 mV Ranges:	5 + 1 µV
1V Range:	4 + 1
10V Range:	3 + 0.5
100V Range:	4 + 1
1000V Range (requires Opt. 30):	5 + 1

Output Impedance/Max Output Current:
100 µV to 100 mV Ranges: 100Ω.
1V to 1000V Ranges: 25 mA max.

AC Voltage (Option 20)

Ranges: 1 mV to 1000V in decades.
Resolution: 6 1/2 digits or 100 nV, whichever is greater.
Frequency: Ranges: 10 Hz to 1 MHz. Resolution: 1% of setting or 1Hz. Accuracy: <±100 ppm.
Maximum Capacitive load: 1000 pF on 1V to 100V ranges, 300 pF on 1000V range.
Accuracy: 90 days, 23°C ± 1°C: ±(ppm Output + ppmFS) (FS = 2 X Range)

1 mV to 100 mV Ranges

250 + 30 + 7 µV:	(10 - 31 Hz)
200 + 30 + 7 µV:	(32 - 330 Hz)
150 + 20 + 5 µV:	(300 Hz - 10 kHz)
160 + 30 + 7 µV:	(10k - 33 kHz)
480 + 40 + 9 µV:	(30k - 100 kHz)
1200 + 100 + 20 µV:	(100k - 330 kHz)
2300 + 1000 + 20 µV:	(300k - 1 MHz)

1V and 10V Ranges

210 + 50:	(10 - 31 Hz)
140 + 30:	(32 - 330 Hz)
80 + 20:	(300 Hz - 33 kHz)
130 + 20:	(30k - 100 kHz)
320 + 60:	(100k - 330 kHz)
2000 + 500:	(300k - 1 MHz)

100V Range

210 + 50:	(10 - 31 Hz)
140 + 30:	(32 - 330 Hz)
80 + 20:	(300 Hz - 33 kHz)
250 + 40:	(30k - 100 kHz)

1000V Range (reqs. Opt 30)

210 + 30:	(10 - 330 Hz)
160 + 20:	(300Hz - 10 kHz)
200 + 20:	(10k - 33 kHz)

Output Impedance / Max Current:

1mV to 100mV ranges:	30Ω.
1V range:	50mA rms.
10V range:	60mA rms.
100V range:	120mA rms.
1000V range, <3kHz:	15mA rms.
1000V range, >3kHz:	65mA rms.

DC Current (Option 40)

Ranges: 100 µA to 10A in decades.
Resolution: 6 1/2 digits or 100 pA, whichever is greater.
Accuracy: 90 days, 23°C ± 1°C: ±(ppm Output + ppmFS) (FS = 2 X Range)

100 µA Range:	50 + 10
1 mA Range:	35 + 10
10 mA Range:	35 + 10
100 mA Range:	35 + 10
1A Range:	60 + 15
10A Range (Reqs Opt. 60):	70 + 25

AC Current (Option 40)

Ranges: 100 mA to 10A in decades.
Resolution: 6 1/2 digits or 100 pA, whichever is greater.
Accuracy: 90 days, 23°C ± 1°C: ±(ppm Output + ppmFS) (FS = 2 X Range)

100 µA Range

120 + 30:	(10 Hz - 1 kHz)
250 + 40:	(1 k - 5 kHz)

1 mA, 10mA & 100mA Ranges

70 + 30:	(10 Hz - 1 kHz)
120 + 30:	(1k - 5 kHz)

1A Range

250 + 30:	(10 Hz - 1 kHz)
400 + 40:	(1k - 5 kHz)

10A Range (Requires Opt. 60):

300 + 100:	(10 Hz - 1 kHz)
750 + 100:	(1k - 5 kHz)
1500 + 300:	(5k - 10kHz)
5500 + 1600:	(10k - 20kHz)

Resistance (Option 50)

Ranges: 10Ω to 100 MΩ in decades. (Ranges are nominal, actual calibrated values are displayed).
Connections: Selectable 2 or 4-wire, remote/local guard.
Display Resolution: 7 1/2 digits
Accuracy: 90 days, 23°C ± 1°C: ±(ppm Output):

10Ω:	15
100Ω, 1 kΩ, 10 kΩ:	6
100kΩ:	7
1 MΩ:	16
10 MΩ:	40
100 MΩ:	80

CALIBRATORS

MODELS 4808, 4800 & 4805

4805 SPECIFICATIONS

DC Voltage

Ranges: 100 µV to 1000V in decades.
Resolution: 6 1/2 digits or 10 nV, whichever is greater.
Accuracy: 90 days, 23°C ±1°C: ±(ppm Output + ppmFS) (FS = 2 X Range)

100 µV to 100 mV Ranges:	15 + 1 µV
1V to 100V Ranges:	15 + 1

Output Impedance/Max Output Current:
100 µV to 100 mV Ranges: 100Ω.
1V to 1000V Ranges: 25 mA max.

AC Voltage (Option 20)

Ranges: 1 mV to 1000V in decades.
Resolution: 5 1/2 digits or 1 µV, whichever is greater.
Frequency: Ranges: 10 Hz to 100kHz. Resolution: 1% of setting or 1Hz. Accuracy: <±100 ppm.
Maximum Capacitive load: 1000 pF on 1V to 100V ranges, 300 pF on 1000V range.
Accuracy: 90 days, 23°C ± 1°C: ±(ppm Output + ppmFS) (FS = 2 X Range)

1 mV to 100 mV Ranges

300 + 60 + 10 µV:	(10 - 31 Hz)
250 + 60 + 10 µV:	(32 - 33kHz)
800 + 80 + 10 µV:	(30k - 100 kHz)

1V and 10V Ranges

300 + 60:	(10 - 31 Hz)
250 + 50:	(32 - 33kHz)
300 + 80:	(30k - 100 kHz)

100V Range

300 + 60:	(10 - 31 Hz)
250 + 50:	(32 - 33kHz)
300 + 80:	(30k - 100 kHz)

1000V Range

300 + 60:	(10 - 330 Hz)
250 + 50:	(300Hz - 10 kHz)
300 + 80:	(10k - 33 kHz)

Output Impedance / Max Current:

1mV to 100mV ranges:	30Ω.
1V range:	50mA rms.
10V range:	60mA rms.
100V range:	120mA rms.
1000V range, <3kHz:	15mA rms.
1000V range, >3kHz:	65mA rms.

DC Current

Ranges: 100 µA to 10A in decades.
Resolution: 5 1/2 digits or 100 pA, whichever is greater.
Accuracy: 90 days, 23°C ± 1°C: ±(ppm Output + ppmFS) (FS = 2 X Range)

100 µA to 100mA Ranges:	50 + 15
1A Range:	115 + 20
10A Range (Requires Opt. 60):	150 + 25

AC Current

Ranges: 100 mA to 10A in decades.
Resolution: 5 1/2 digits or 100 pA, whichever is greater.
Accuracy: 90 days, 23°C ± 1°C: ±(ppm Output + ppmFS) (FS = 2 X Range)

100 µA Range

400 + 80:	(10 Hz - 1 kHz)
550 + 100:	(1 k - 5 kHz)

1 mA, 10mA & 100mA Ranges

220 + 80:	(10 Hz - 1 kHz)
350 + 80:	(1k - 5 kHz)

1A Range

400 + 80:	(10 Hz - 1 kHz)
550 + 100:	(1k - 5 kHz)

10A Range (Requires Opt. 60):

500 + 100:	(10 Hz - 1 kHz)
1000 + 100:	(1k - 5 kHz)
2000 + 300:	(5k - 10kHz)
6000 + 2000:	(10k - 20kHz)

Resistance

Ranges: 10Ω to 100 MΩ in decades. (Ranges are nominal, actual calibrated values are displayed).
Connections: Selectable 2 or 4-wire, remote/local guard.
Display Resolution: 6 1/2 digits
Accuracy: 90 days, 23°C ± 1°C: ±(ppm Output):

10Ω:	30
100Ω, 1 kΩ, 10 kΩ, 100kΩ:	6
1 MΩ:	25
10 MΩ:	100
100 MΩ:	125

GENERAL (4808, 4800 & 4805)

Environmental:
Operating Temp: 0°C to +50°C.
Storage Temp: -40°C to +70°C.

Dimensions: 178 mm (7 in.) high; 455 mm (17.9 in.) wide; 563 mm (22.2 in.) deep.

Weight: 36 kg (80 lb.) net.

Power: 100/120/220/240 Vac ±10%, 50 Hz or 60 Hz. Consumption 370 VA standby, 660 VA full power.

4808 & 4800 OPTIONS

10: DCV Ranges to 200V.
20: ACV Ranges to 200V.
30: 1000V range for DCV, ACV (requires option 10, option 20 or both)
40: DCI and ACI to 2A (requires option 10, option 20 or both)
50: Ω Ranges
60: DCI and ACI ranges extender to 11A DC or RMS AC (requires Options 10 and/or 20 and option 40)
80: 115V 60Hz line operation.
81: 115V 50Hz line operation.
90: Rack Mounting Kit.

4805 OPTIONS

60: DCI and ACI ranges extender to 11A DC or RMS AC
80: 115V 60Hz line operation.
81: 115V 50Hz line operation.
90: Rack Mounting Kit.

ACCESSORIES

1510: General purpose AC and DC lead kit with fused probes
1512: 480X series calibrator to 4920 N-type, 4-wire lead set
1513: General purpose screened 4-wire AC lead set
1514: General purpose 5 banana to 3 banana DC lead set
1516: 480X series calibrator to 5 banana general purpose DC lead set

ORDER INFORMATION

Model 4808
Option 10
Option 20
Option 30
Option 40
Option 50
Option 60
Option 80
Option 81
Option 90
Configured with Options 10, 20, 30, 40, 50
Configured with Options 10, 20, 30, 40, 50, 60

Model 4800
Option 10
Option 20
Option 30
Option 40
Option 50
Option 60
Option 80
Option 81
Option 90
Configured with Options 10, 20, 30, 40, 50
Configured with Options 10, 20, 30, 40, 50, 60

Model 4805
Model 4805 with Option 60
Option 80
Option 81
Option 90

Accessory 1510
Accessory 1512
Accessory 1513
Accessory 1514
Accessory 1516
Factory/FOB: Indianapolis, IN & Norwich, England

For a demonstration contact your nearest Wavetek representative (page 146).

AVMS

- **Alternating Voltage Measurement Standard**
- **High Accuracy - Simple and Easy to Use**
- **Fully IEEE-488.2 Programmable**

The 4920 AVMS is designed to replace the traditional AC/DC Thermal Transfer Standard in high accuracy AC measurement applications. Fully traceable measurements can be made with uncertainties equal to or better than all but the most specialized standards, but with the speed, ease of use and convenience of a single, programmable, intelligent device. The ease and speed of use of the 4920 make it the most economical method of high accuracy AC calibration.

AC Voltage

Ranges: 3 mV to 1000V in 3, 10, 30 sequence.
Resolution: 100 nV, 7 1/2 digits.
Operating Range: from 30% to 110% of Nominal Range Value.
Accuracy: 90 Days, 23°C ± 1°C, ±(ppmR) - Spot calibrated specifications shown for 300mV to 1000V ranges:

3mV Range

1270	(10 - 100Hz)
1100	(100 - 30kHz)
1580	(30k - 200kHz)
2750	(200k - 500kHz)
5400	(500k - 1MHz)

10mV Range

390	(10 - 100Hz)
230	(100 - 30kHz)
530	(30k - 200kHz)
1450	(200k - 500kHz)
3500	(500k - 1MHz)

30mV Range

310	(10 - 100Hz)
180	(100 - 30kHz)
390	(30k - 200kHz)
1150	(200k - 500kHz)
2700	(500k - 1MHz)

100mV Range

235	(10 - 100Hz)
100	(100 - 30kHz)
210	(30k - 200kHz)
620	(200k - 500kHz)
1600	(500k - 1MHz)

300mV, 1V, 3V, 10V and 30V Ranges

250	(1 - 2Hz)
50	(2 - 10Hz)
10	(10 - 30kHz)
25	(30k - 200kHz)
75	(200k - 500kHz)
200	(500k - 1MHz)

100V Range

250	(1 - 2Hz)
50	(2 - 10Hz)
10	(10 - 30kHz)
25	(30k - 200kHz)

300V and 1000V Ranges

260	(1 - 2Hz)
60	(2 - 10Hz)
15	(10 - 20kHz)
30	(20k - 100kHz)

Wideband Option (Option 50)

Range: 1V to 3.5V on single 3V range.
Input: N-type connector, 50Ω impedance, VSWR = 1.02:1 (10Hz - 50MHz)

Accuracy: 1 year, 23°C ± 1°C

0.1%	(10 - 40Hz)
0.125%	(40 - 1MHz)
0.15%	(1M - 10MHz)
0.2%	(10M - 20MHz)
0.5%	(20M - 30MHz)
2%	(30M - 50MHz)

Flatness: WRT 1kHz, 1 year, 23°C ± 1°C

0.075%	(10 - 40Hz)
0.025%	(40 - 1MHz)
0.05%	(1M - 10MHz)
0.1%	(10M - 20MHz)
0.3%	(20M - 30MHz)
1%	(30M - 50MHz)

GENERAL

Remote Programming: IEEE-488.2
Environmental: Operating Temp: 0°C to +50°C.
Dimensions: 88 mm (3.5 in.) X 427 mm (16.8 in.) X 487 mm (19.2 in.)
Weight: 11.8 kg (26 lb.).
Power: 100-130 Vac or 200-260 Vac, 47 to 63 Hz. 37VA.

CONFIGURATIONS

Model 4920: Alternating Voltage Measurement Standard, with 300mV to 1000V ranges.

OPTIONS

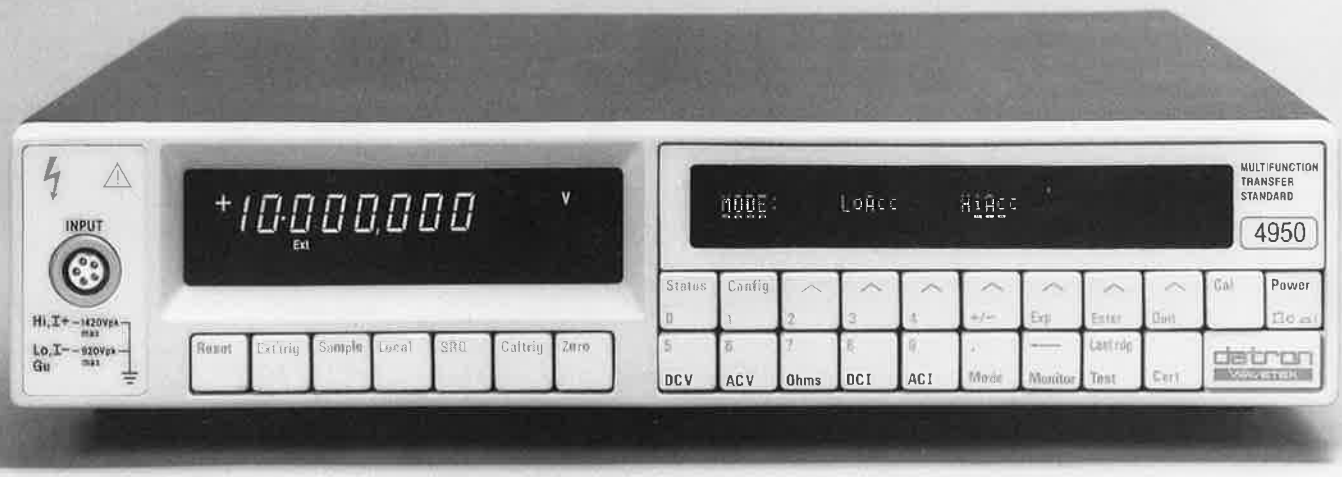
10: 3mV to 100mV Ranges
50: Wideband Module to 50MHz
80: 115V 60 Hz Line Operation
81: 115V 50 Hz Line Operation
90: Rack Mounting Kit
95: Rack Mount Slides

ACCESSORIES

1508: Datron 470X series calibrator safety connector to 4920 N-type AC lead kit
1509: Datron 470X series calibrator safety connector to 4920 banana AC lead kit
1512: Datron 480X series calibrator safety connector to 4920 N-type AC lead kit
1515: N-type to N-type lead kit for Wideband function
1516: Datron 480X series calibrator safety connector to 4920 banana DC lead kit
4921: Adaptor for Fluke A40 Current Shunts

ORDER INFORMATION

Model 4920
Option 10
Option 50
Option 80
Option 81
Option 90
Option 95
Accessory 1508
Accessory 1509
Accessory 1512
Accessory 1515
Accessory 1516
Accessory 4921
Factory/FOB: Indianapolis, IN & Norwich, England



Multifunction Transfer Standard

- **Supports all Datron Calibrator Models**
- **Transfers Traceability Directly to Calibrator Output Terminals**
- **Supports all Calibrator Ranges and Functions**
- **Designed for Transport Applications**
- **Provides On-Site Calibration to Reduce Calibrator Downtime**

Increasing performance levels of today's multifunction calibrators are placing such demands on traditional calibration methodology that users are now being forced to higher level standards along with cumbersome manual transfer devices, in order to obtain uncertainties which align with the performance needs of the calibrator and its workload.

Today's technology now allows a different approach; advanced instrument design techniques and improved component performance have enabled Datron to produce the model 4950, a self-contained programmable transfer standard, capable of fully traceable high accuracy calibration of the latest range of high performance multifunction calibrators.

The model 4950 Multifunction Transfer Standard (MTS) is a compact microprocessor controlled instrument specifically designed for stability under transport conditions. It provides an independant means of checking the calibration of a calibrator and periodically travels to a remote standards laboratory for certification. On its return, the results of the certification can be used to measure and adjust the calibrator outputs.

The MTS provides all the measurement functions required to calibrate a multifunction calibrator. Its optimized performance envelope is restricted to pre-defined measurement points, each of which are separately calibrated.

The instrument contains no physically adjusted circuit elements; calibration corrections are stored in two non-volatile memories designated *"Baseline"* and *"Certified"*. Baseline calibration constants are determined at manufacture and remain stored within the instrument for life, enabling its long term performance to be monitored. *Certified* calibration constants are stored during comparison to standards for the specific calibration of the subject calibrators.

The 4950 is designed to be used in either of two modes. In one, the 4950 is "owned" by a higher level standards laboratory. The *Certified* calibration stores are calibrated to higher level standards at the standards laboratory before the 4950 is transported to the calibrator site. The outputs of the calibrator are compared to the 4950 on each range of each function, in order to determine whether the calibrator is within the required specification at the end of its previous calibration cycle. The calibrator outputs are then calibrated to the *Certified* calibration stores. The 4950 is then returned to the higher level standards laboratory and rechecked against the measurement standards used to calibrate the *Certified* calibration stores prior to shipment to the calibrator site. This process 'closes the measurement loop', providing the highest confidence in the integrity of the transfer.

Alternatively, the 4950 may be "owned" by the calibrator owner. In this case, the *Baseline* calibration stores of the 4950 are

compared with the calibrator prior to shipment to the higher level standards laboratory. At the standards lab, the *Certified* calibration stores are calibrated to higher level standards and the 4950 returned to the calibrator site. Before these new *Certified* stores are used to calibrate the calibrator, the *Baseline* calibration stores are re-compared with the calibrator outputs. By comparing the pre-shipment and post shipment *Baseline* measurements ("closing the measurement loop"), it is possible to determine whether the 4950 has travelled successfully. If all is well, then the *Certified* calibration stores in the 4950 are used to calibrate the calibrator.

The 4950 is supplied with a software package that runs on an industry standard PC in the Windows 3 environment. The user interface consists of a mouse, pull-down menus and graphical windows to guide the user through the calibration process. The entire procedure is automated, reducing the task from days of a skilled engineer's time to just a few hours on an automated system. In addition to considerable time saving, automation provides a more repeatable process and is less prone to human error. The output of the software package is in an ASCII format compatible with most wordprocessors, or Microsoft's Excel spreadsheet package. Standard statistical techniques can then be applied to measurement data to generate percentage confidence limits for the reported measurement uncertainties, or adjust the uncertainties reported to reflect a desired confidence level.

SPECIFICATIONS

DC Voltage

Transfer Stability: 30 days, 23°C ± 1°C, at stated levels ±10% (±ppmR):

±100 mV:	3
±1V:	2
±10V, 19V:	1
±100V:	2
±1000V:	2

True RMS AC Voltage

Transfer Stability: 30 days, 23°C ± 1°C, at stated levels ±10% and stated frequencies ±1%

1mV, 10mV and 100mV

10Hz, 20Hz, 30Hz, 40Hz, 55Hz (±10%), 300Hz, 1kHz, 10kHz, 20kHz, 30kHz: 20 + 1µV

50kHz:	30 + 1µV
100kHz:	50 + 2µV
300kHz:	100 + 2µV
500kHz:	200 + 2µV
1MHz:	300 + 2µV

1V and 10V

10Hz, 20Hz, 30Hz, 40Hz, 55Hz (±10%), 300Hz, 1kHz, 10kHz, 20kHz, 30kHz:	10
50kHz:	20
100kHz:	30
300kHz:	70
500kHz:	100
1MHz:	200

19V

1kHz:	10

100V

10Hz, 20Hz, 30Hz, 40Hz, 55Hz (±10%), 300Hz, 1kHz, 10kHz, 20kHz, 30kHz:	10
50kHz:	20
100kHz:	30
200kHz:	50

700V

100kHz:	50

1000V

55Hz (±10%), 300Hz, 1kHz, 10kHz, 20kHz, 30kHz:	15

DC Current

Transfer Stability: 30 days, 23°C ± 1°C, at stated levels ±10% (±ppm)

±100µA:	7
±1mA:	7
±10mA:	7
±100mA:	7
±1A:	15
±10A:	20

AC Current

Transfer Stability: 30 days, ±1°C, at stated levels ±10% and stated frequencies ±1%

100µA

10Hz, 20Hz, 30Hz, 40Hz, 55Hz (±10%), 300Hz, 1kHz:	100
5kHz:	200
10kHz:	600

1mA, 10mA, 100mA & 1A

10Hz, 20Hz, 30Hz, 40Hz, 55Hz (±10%), 300Hz, 1kHz:	60
5kHz:	100
10kHz:	300

10A

10Hz, 20Hz, 30Hz, 40Hz, 55Hz (±10%), 300Hz, 1kHz:	200
5kHz:	300
10kHz:	600
20kHz:	1000

Resistance

Transfer Stability: 30 days, ±1°C, at stated levels ±10%

1Ω:	14
3Ω:	10
10Ω & 19Ω:	5
30Ω, 100Ω, 190Ω, 300Ω, 1kΩ, 1.9kΩ, 3kΩ, 10kΩ & 19kΩ:3	
30kΩ, 100kΩ & 190kΩ:	5
300kΩ, 1MΩ & 1.9MΩ:	8
3MΩ, 10MΩ & 19MΩ:	12
30MΩ & 100MΩ:	180

Computer requirements for Software System:

Minimum: PC compatible with 80286 processor (12MHz), 4MBytes RAM, DOS 3.31 or later, 20MBytes hard disk, mouse, keyboard, VGA monitor (color or monochrome), 3.5 inch or 5.25 inch floppy disk, 9-pin dot matrix printer, Microsoft Windows version 3.0

Recommended: As above, except 80386DX processor (25MHz), DOS 5.0, VGA color monitor, 40MByte hard disk, Laser printer.

GENERAL

Calibration: Twin Calibration stores: "Baseline" and "Certified", calibrated from front panel or remote interface.

Remote Programming: IEEE-488.2

Environmental:

Operating temp: 0°C to +50°C.
Storage temp: -40°C to +70°C.

Dimensions: 88 mm (3.5 in.) X 427 mm (16.8 in.) X 487 mm (19.2 in.)

Weight: 13.5 kg (30 lb).

Power: 90 - 145 Vac or 187 - 292 Vac, 46 Hz-66 Hz, 37VA.

OPTIONS

80: 115V 60 Hz Line Operation
81: 115V 50 Hz Line Operation
90: Rack Mounting Kit
95: Rack Mount Slides

ACCESSORIES

4953: 10A Current Shunt

ORDER INFORMATION

Model 4950 (includes dedicated input lead, control software set, IEEE interface card, two IEEE interface cables, ruggedized transit case)

Option 80
Option 81
Option 90
Option 95
Accessory 4953
Factory/FOB: Indianapolis, IN & Norwich, England

For complete specifications or a demonstration contact your nearest Wavetek representative (page 146).

DCV References

- **The First Real Alternatives to the Weston Cell**
- **One or Four Truly Independent 10V Outputs**
- **Stability to Better Than 1ppm/year**
- **Low Voltage Outputs, Buffered 10V Output**
- **Long Life Battery Backup Mode**

The models 4910 and 4911 both offer four 10V "cells" at the 10V level, providing the stability, redundancy and self-checking capabilities required by a laboratory standard. The 4912 offers an economic single 10V output and long battery life, making it ideal for transfer applications.

Versatile Architecture
Both the 4910 and 4911 offer four truly independent 10V output "cells", each possessing its own power supplies and control circuits, allowing direct intercomparison between the output terminals in order to detect and evaluate drift in any cell. Each cell's total independence means that errors arising from circuit elements are uncorrelated and therefore detectable. The output of each cell is adjustable with <0.1 ppm resolution, so that they may be calibrated to nominal to allow intercomparisons with a very high level of accuracy.

The four 10V cells may be selectively averaged in hardware giving a significant benefit in long term stability and short term noise when compared with the output of just one cell. The 10V average output provides the ideal low noise reference against which individual cells may be compared, and in the 4910, is permanently connected to the input of a four wire sensed buffer capable of sourcing 15 mA for driving an accurate voltage into a load without compensations. Cells included within the average group are identified by a front panel LED indicator.

Each cell's independence also allows higher voltages to be obtained by "stacking" cells, to provide up to 40V from one unit.

The 4910 and 4912 also offer adjustable outputs at the 1V and 1.018V levels.

SPECIFICATIONS

4910 & 4911 Stability, ppm (±1°C)

	30 days	90 days	1 year
10V Average	0.3	0.8	1.0
10V Cell	0.3	1.0	1.5
4-wire buffer*	0.3	1.0	1.5
1.018V*, 1V*	0.6	1.5	2.0

4912 Stability, ppm (±1°C)

	30 days	90 days	1 year
10V Cell	0.5	1.0	1.7
4-wire buffer	0.5	1.0	2.2
1.018V, 1V	1.0	2.1	2.9

Temperature Coefficient (0°C - 50°C)

10V Average & Cell	0.05 ppm/°C
4-wire buffer*	0.06 ppm/°C
1.018V*	0.10 ppm/°C
1V*	0.12 ppm/°C

Output Resistance/Protection

4-wire buffer*	<100 μΩ

4-wire buffer* will drive to 15 mA

Other outputs	100Ω

Outputs withstand indefinite shorts, transients to 1100V (to 25 mA).

Setting Resolution

10V Cell	<±0.1 ppm
1.018V*, 1V*	<±0.2 ppm

GENERAL

Environmental
Operating temperature: 0°C to +40°C
Storage temperature: -40°C to +50°C

Dimensions
177 mm (7 in.) high 214 mm (8.5 in.) wide, 591 mm (23.3 in.) depth

Weight: 20kg (44 lb)

Power
Line: 100V, 120V, 220V, 240V ±10%, 47-63 Hz, consumption <40VA.
Low voltage input: 10V - 40 Vdc.
Battery Backup, Transit Mode, 7 days at 25°C, to 4 days at 0°C, ambient.

*(*Not applicable to 4911)*

OPTIONS

10: Calibration and Hot Shipment
20: Drift Rate Characterization. Must be ordered with Option 10.
30: 1.018V Set to Requested Level. Must be ordered with Opt. 10.
40: Ruggedized Transit Case
50: Soft Carrying Case
90: Rack Mount Kit

ORDER INFORMATION

Model 4910
Model 4911
Model 4912
Option 10
Option 20
Option 30
Option 40
Option 50
Option 90
Factory/FOB: Indianapolis, IN & Norwich, England

For full specifications or demonstration contact your nearest Wavetek representative (page 146).

PRECISION DIGITAL MULTIMETERS

MODELS 1061A, 1062 & 1062MT

Autocal DMMs

- **6½ Digit Meters**
- **High Accuracy ACV Option**
- **IEEE-488 and MATE Models**

The 1061A/1062 series are accurate 6 1/2 digit DMMs optimized for systems applications, which also satisfy a wide range of bench and professional requirements.

Instrument Configurations
The 1061A is a DC voltmeter to which options may be added as required. Optional functions include true RMS ACV, Ω, Current, Ratio, and IEEE-488. The model 1062 is a fixed configuration version, featuring DCV, true rms ACV, Resistance, selectable rear inputs, and IEEE-488. The 1062MT is a MATE version of the 1062.

DC Voltage
Ranges: 100 mV to 1000V in decades.
Resolution: 100 nV, 6 1/2 digits.
Accuracy: 90 Days, 23°C ± 5°C, ±(ppmR + ppmFS):

100 mV Range:	30 + 8.
1V & 10V Ranges:	20 + 4.
100V & 1000V Ranges:	30 + 4.

Read Rate: 1.5/s at 6 1/2 digits, 200/s in Super-fast mode, 4 digits.

True RMS AC Voltage (Opt. 10).
Ranges: 100 mV to 1000V in decades.
Resolution: 1 µV, 5 1/2 digits.
Accuracy: 90 Days, 23°C ± 5° C, Signal >0.25%FS, ±(%R + %FS):
100 mV and 1000V Ranges

45 Hz - 5 kHz:	0.08 + 0.02.
5 kHz - 100 kHz:	0.2 + 0.05.

1V to 100V Ranges

45 Hz - 5 kHz:	0.04 + 0.01.
5 kHz - 100 kHz:	0.1 + 0.025.

High Performance True RMS ACV (Opt. 12)
Resolution: 100 nV, 6 1/2 digits.
Accuracy: 90 days, 23°C ± 5°C, Signal >1%FS, ±(%R + %FS):
100 mV and 1000V Ranges

45 Hz - 2 kHz:	0.04 + 0.007.
2 kHz - 30 kHz:	0.08 + 0.015.
30 kHz - 100 kHz:	0.2 + 0.022.

Add 0.01% per 100V above 500V.
1V to 100V Ranges

45 Hz - 2 kHz:	0.025 + 0.005.
2 kHz - 30 kHz:	0.05 + 0.01.
30 kHz - 100 kHz:	0.1 + 0.02.

Resistance
Ranges: 10Ω to 10 MΩ in decades.
Resolution: 10 µΩ, 6 1/2 digits.
Accuracy: 90 Days, 23°C ± 5° C, ±(ppmR + ppmFS):

10Ω Range:	40 + 8.
100Ω to 10 kΩ Range:	30 + 4.
100 kΩ Range:	40 + 4.
1 MΩ Range:	100 + 4.
10 MΩ Range:	300 + 4.

DC Current
Ranges: 100 µA to 1A in decades.
Resolution: 1 nA, 5 1/2 digits.
Accuracy: 90 Days, 23°C ± 5°C, ±(ppmR + ppmFS):
100 µA to 100 mA Ranges: 100 + 20.
1A Range: 200 + 20.

AC Current
Ranges: 100 µA to 1A in decades.
Resolution: 1nA, 5 1/2 digits.
Accuracy: 90 Days, 23°C ± 5°C, ±(%R + %FS):
100µA to 1A Ranges:

45 Hz - 5 kHz:	0.2 + 0.05

GENERAL
Remote Programming:
IEEE-488, MATE (CIIL) on MT models.
Operating Temp: 0°C to +50°C.
Dimensions: 88 mm (3.5 in.) X 455 mm (17.9 in.) X 420 mm (16.5 in.)
Weight: 10 kg (22 lb).
Power: 105-127 Vac or 205-255 Vac, 50 Hz, 60 Hz, or 400 Hz. 20 Watts approx.

CONFIGURATIONS
Model 1061A: 6 1/2 Digit AUTOCAL DMM (includes DCV, 5 Year Warranty).
Model 1062: (U.S. only) 6 1/2 Digit AUTOCAL DMM (includes DCV, ACV, Ω, rear input, IEEE-488, 1 Year Warranty).
Model 1062-MT: as 1062 with MATE interface.
Model 1062-MT5: contact Sales Office.

OPTIONS
10: True RMS AC Converter
12: High Performance AC Converter
20: 2-wire and 4-wire Ω Converter
30: Current Converter (Not available with Option 12)
40: Comprehensive Ratio and Rear Input
41: Selectable Rear Input (Included with Option 40)
50: IEEE-488 Interface
52: Remote Trigger (Included in Option 50)
70: Analog Output
80: 115V 60 Hz Line Operation
81: 115V 50 Hz Line Operation
82: 115V 400 Hz Line Operation
90: Rack Mounting Kit

ACCESSORIES
1510: Lead Kit with DC & AC leads and fused probes

ORDER INFORMATION
Model 1061A
Model 1062
Model 1062MT
Option 10
Option 12
Option 20
Option 30
Option 40
Option 41
Option 50
Option 52
Option 70
Option 80
Option 81
Option 82
Option 90
Accessory 1510
Factory/FOB: Indianapolis, IN & Norwich, England

PRECISION DIGITAL MULTIMETERS

MODEL 1281

Selfcal DMM

- **World's Finest 8½ Digit DMM**
- **1 Year DCV Specifications to ±3.1 ppm**
- **1 Year ACV Specifications to ±65 ppm**

State of the Art Accuracy
Designed for use in Standards and Calibration laboratories, the 1281 provides the ultimate in electrical measurement, outperforming all rivals in accuracy, functional capability, and ease of use.

Applications
Long term accuracy and functional capability make the 1281 the ideal choice as a laboratory standard for the smaller calibration lab, while its short term stability and ease of use makes it ideal for short term transfers in a Standards lab.

The 1281 incorporates many features to enhance the usefulness of its high accuracy, such as simultaneous display of voltage and frequency. Its low-current ohms modes are designed for resistance thermometry. Ratio measurements (including difference and deviation), rolling and block averaging, math computations, and automatic readout of measurement uncertainty are possible.

DC Voltage
Ranges: 100 mV to 1000V in decades.
Resolution: 10 nV, 8 1/2 digits.
Accuracy: 1 Year, 23°C ± 5°C, ±(ppmR + ppmFS) (FS = 2 X Range):

100 mV Range:	6 + 0.5
1V Range:	3 + 0.2
10V Range:	3 + 0.1
100V Range:	6 + 0.2
1000V Range:	6 + 0.2

Read Rate: 1/6s at 8 1/2 digits, 150/s at 4 1/2 digits.

True RMS AC Voltage
Ranges: 100 mV to 1000V in decades.
Resolution: 100 nV, 6 1/2 digits.
Accuracy: 1 year, 23°C ± 5°C, signal >1%FS, ±(ppmR + ppmFS):

100 mV Range:	
40 Hz-10 kHz	100+20
10-30 kHz	300+40
30-100 kHz	700+100
1V to 100V Ranges:	
40-100 Hz	80+10
100 Hz-2 kHz	60+10
2-10 kHz	80+10
10-30 kHz	200+20
30-100 kHz	500+100
100-300 kHz	0.3%+0.1%
300 kHz-1 MHz	1%+1%
1000V Range:	
40 Hz-10 kHz	80+10
10-30 kHz	200+20
30-100 kHz	500+100

Read Rate: 1/s at 6 1/2 digits.

Resistance
Ranges: 10Ω to 1GΩ in decades.
Resolution: 1 μΩ, 8 1/2 digits (Except 100 MΩ and 1 GΩ ranges).
Accuracy: 1 Year, 23°C ± 5°C, ±(ppmR + ppmFS) (FS = 2 X Range):

10Ω Range:	12+1
100Ω Range:	8+0.3
1kΩ to 100 kΩ Ranges:	6+0.3
1 MΩ Range:	11+0.7
10 MΩ Range:	25+4
100 MΩ Range:	300+45
1 GΩ Range:	0.3%+450

Read Rate: As DCV function

DC Current
Ranges: 100 μA to 1A in decades.
Resolution: 100 pA, 6 1/2 digits.
Accuracy: 1 Year, 23°C ± 5°C, ±(ppmR + ppmFS) (FS = 2 X Range):

100 μA to 10 mA Ranges:	25+2
100 mA Range:	50+5
1A Range:	150+10

AC Current
Ranges: 100 μA to 1A in decades.
Resolution: 1 nA, 5 1/2 digits.
Accuracy: 1 Year, 23°C ± 5°C, ±(%R + %FS):

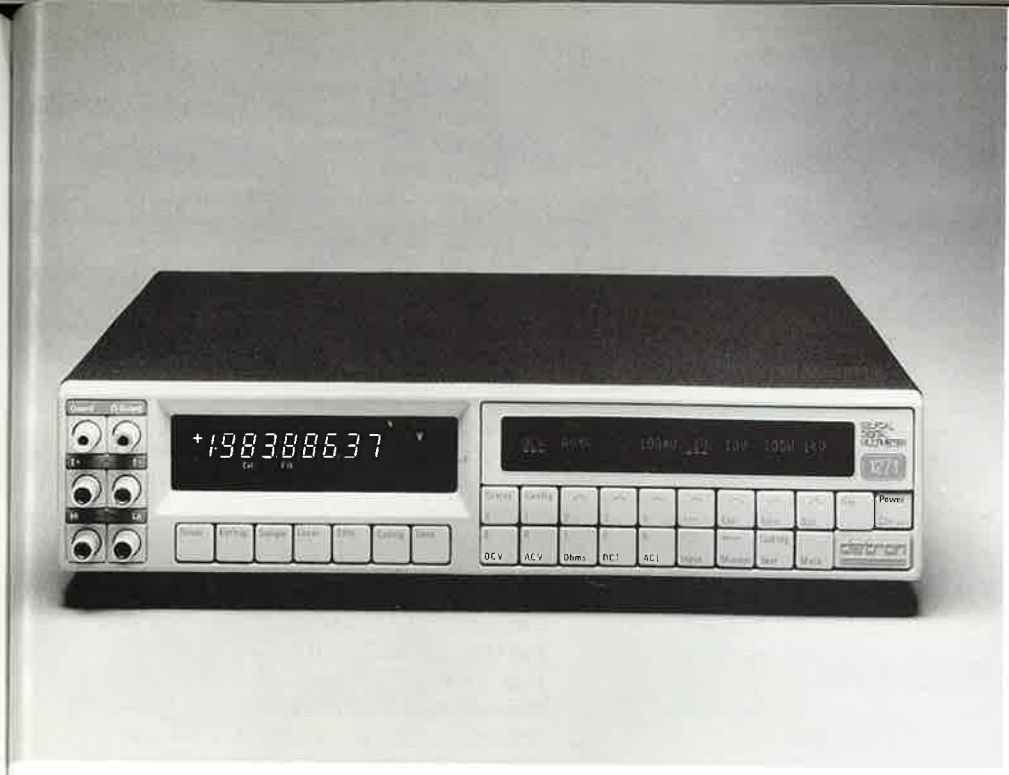
100 μA to 100 mA Range:	
40 Hz-5 kHz	200+100
1A Range:	
10 Hz-1 kHz	500+200
1-5 kHz	0.15%+0.04%

GENERAL
Remote Programming: IEEE-488.2
Operating temp: 0°C to +50°C.
Dimensions: 88 mm (3.5 in.) X 427 mm (16.8 in.) X 487 mm (19.2 in.)
Weight: 13.5 kg (30 lb).
Power: 100-130 or 200-260 Vac, 47 Hz-63 Hz, 37VA.

OPTIONS
10: True RMS AC Converter
20: 2-Wire and 4-Wire Ω Converter
30: Current Converter. (Requires Opt. 20)
70: Isolated Analog Output
80: 115V 60 Hz Line Operation
81: 115V 50 Hz Line Operation
90: Rack Mounting Kit

ACCESSORIES
1510: Lead kit, DC & AC leads with fused probes

ORDER INFORMATION
Model 1281
(Includes DCV, Ratio, Rear Inputs, IEEE-488.2, 1 Year Warranty)
Option 10
Option 20
Option 30
Option 70
Option 80
Option 81
Option 90
Accessory 1510
Factory/FOB: Indianapolis, IN & Norwich, England



PRECISION DIGITAL MULTIMETERS

MODEL 1271

Selfcal DMM

- **Designed for Systems Applications**
- **High Speed, High Accuracy & High Functionality**

The Datron 1271 is designed for the system specialist with performance optimized for military and aerospace test applications.

With DCV and IEEE-488.2 bus control fitted as standard, the 1271 also offers individual Ω, Ratio, DCI & ACI options and two versions of ACV to produce unrivalled combinations of performance and price.

SPECIFICATIONS

DC Voltage

Ranges: 100 mV to 1000V in decades.
Resolution: 10 nV, 8 1/2 digits.
Accuracy: 1 year, 23°C ± 5°C, ±(ppmR + ppmFS): (FS = 2 X Range)

100 mV & 1000V Ranges:	10 + 1
1V & 100V Ranges:	8 + 0.5
10V Range:	7 + 0.25

Read Rate: 3/s at 7 1/2 digits, 1000/s at 5 1/2 digits.

True RMS AC Voltage (High Speed)

Ranges: 100 mV to 1000V in decades.
Resolution: 100 nV, 6 1/2 digits.
Accuracy: 1 year, 23°C ± 5°C, ±(ppmR + ppmFS) (FS = 2 X Range):

100 mV & 1000V Ranges:

40 Hz-2 kHz	250+70
2-20 kHz	400+120
20-100 kHz	0.16%+0.022%

1V to 100V Ranges:

40-20 kHz	200+50
20-100 kHz	0.1%+0.02%
100-300 kHz	1%+1%
300-1 MHz	2%+2%

Read Rate: 20/s at 6 1/2 digits.

True RMS AC Voltage (High Accuracy)

Ranges: 100 mV to 1000V in decades.
Resolution: 100 nV, 6 digits.
Accuracy: 1 year, 23°C ± 5°C, ±(ppmR + ppmFS) (FS = 2 X Range):

100 mV Range:

40 Hz-10 kHz	100+20
10-30 kHz	300+40
30-100 kHz	700+100

1V to 100V Ranges:

40-100 Hz	80+10
100 Hz-2 kHz	60+10
2-10 kHz	80+10
10-30 kHz	200+20
30-100 kHz	500+100
100-300 kHz	0.3%+0.1%
300 kHz-1 MHz	1%+1%

1000V Range:

40 Hz-10 kHz	80+10
10-30 kHz	200+20
30-100 kHz	500+100

Read Rate: 1/s at 6 1/2 digits.

Resistance

Ranges: 10Ω to 1GΩ in decades.
Resolution: 1 μΩ, 8 1/2 digits (Except 100 MΩ and 1 GΩ ranges).
Accuracy: 1 year, 23°C ± 5°C, ±(ppmR + ppmFS) (FS = 2 X Range):

10Ω Range:	18+2
100Ω to 100 kΩ Range:	10+0.5
1 MΩ Range:	15+1
10 MΩ Range:	30+5
100 MΩ Range:	400+50
1 GΩ Range:	0.3%+500

Read Rate: As DCV function

DC Current

Ranges: 100 μA to 1A in decades.
Resolution: 100 pA, 6 1/2 digits.
Accuracy: 1 year, 23°C ± 5°C, ±(ppmR + ppmFS) (FS = 2 X Range):

100 μA to 10 mA Ranges:	50+2
100 mA Range:	100+5
1A Range:	150+10

AC Current

Ranges: 100 μA to 1A in decades.
Resolution: 1 nA, 5 1/2 digits.
Accuracy: 1 year, 23°C ± 5°C, ±(%R + %FS) (FS = 2 X Range):

100 μA to 100 mA Range:

40 Hz-5 kHz	200+100

1A Range:

10 Hz-1 kHz	500+200
1-5 kHz	0.15%+0.04%

GENERAL

Remote Programming: IEEE-488.2
Operating Temp: 0°C to +50°C.
Dimensions: 88 mm (3.5 in.) X 427 mm (16.8 in.) X 487 mm (19.2 in.) deep.
Weight: 13.5 kg (30 lb).
Power: 100-130 or 200-260 Vac, 47 Hz - 63 Hz, 37VA.

OPTIONS

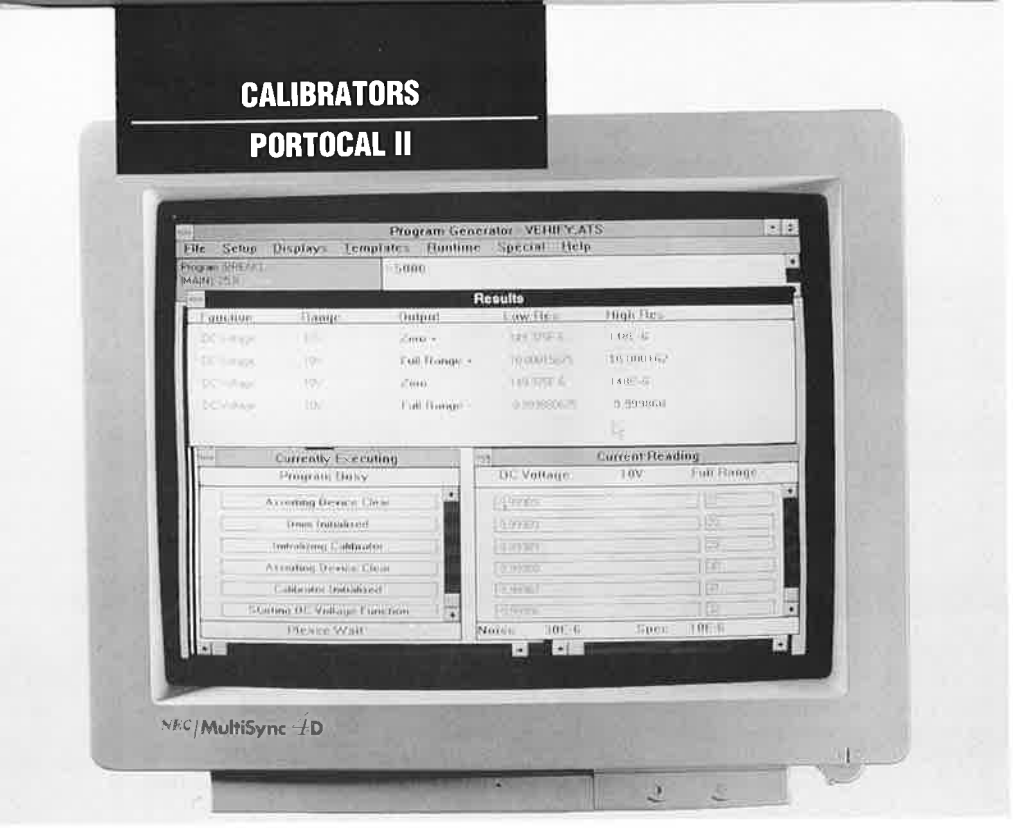
10: True RMS High Speed AC Converter
12: True RMS High Accuracy AC Converter
20: 2-Wire and 4-Wire Ω Converter
30: Current Converter. (Reqs. Opt. 20)
40: Comprehensive Ratio
70: Isolated Analog Output
80: 115V 60Hz Line Operation
81: 115V 50Hz Line Operation
90: Rack Mounting Kit
Model 1271MT: 1271 mainframe with options 12, 20, 30, 40 & 70, and MATE (CIIL) Interface

ACCESSORIES

1510: DMM Lead Kit, with DC & AC leads with fused probes

ORDER INFORMATION

Model 1271
8 1/2 Digit SELFCAL Digital Multimeter (Includes DCV, Rear Input, IEEE-488.2, 1 Year Warranty)
Option 10
Option 12
Option 20
Option 30
Option 40
Option 70
Option 80
Option 81
Option 90
Model 1271MT
Accessory 1510
Factory/FOB: Indianapolis, IN & Norwich, England



Calibration Software

- **Windows-Based Software for PC's**
- **Supports DMM's and Oscilloscopes**
- **Integral Database for Instrument Inventory and Results Management**
- **Complies with MIL-STD-45662A**

Automating calibration leads to better measurement repeatability, consistent documentation, automatic report generation, and increased throughput. Audits are simpler, security and control are increased. In short, automation leads to better quality, higher confidence and lower costs.

Portocal II

Portocal II is a suite of applications programs and data files based on the WaveTest GPIB Test Program Developer. Capable of automated calibration of all types of DMM's and oscilloscopes, it is readily expanded to compare any type of instrument to any type of source or reference. Running under Microsoft Windows, with a graphical user interface, a mouse and pull-down menus, it is immensely powerful while remaining easy to use.

The calibration software has automatic links to an instrument-inventory-and-results database compatible with an industry standard relational database management system. This is supplied in a pre-programmed format, which conforms with the requirements of MIL-STD-45662A. The results-and-inventory manager allows automatic reporting of Significantly Out Of Tolerance (SOT) conditions, Test Uncertainty Ratios (TUR) and Reverse Traceability reports. Additionally, reports are available from the inventory management database that aid the calibration manager's implementation of an instrument recall program, for example.

Two versions of Portocal II are available — the developer's version and a runtime only version. The developer's version allows full customization of the entire calibration system, enabling generation of calibration procedures for DMM's and oscilloscopes. In addition, the results-and-inventory management system may be customized to produce any type of report or certificate required.

The customized calibration system may then be transported to a runtime only system, where calibration procedures may be executed but not altered. Report and certificate contents and formats previously defined on the developer's system (or the defaults supplied with the system) may be produced, but not altered.

The developer's version has three levels of password protection. The System Manager's password safeguards the system against unauthorized modification of the system configuration. To develop new calibration procedures and report formats and contents, the Programmer's password is required. The Operator's password protects against altering the content or sequence of a calibration.

The system uses two IEEE-488 interfaces. One is reserved for connection to the reference, the other for connection to the Unit Under Test (UUT). This means that a faulty UUT cannot interfere with the safe operation of a potentially lethal reference devices such as a DMM calibrator with 1000V output capability.

RUNTIME ONLY SYSTEM

Minimum Computer Configuration: PC-compatible 80386SX at 16 MHz, MSDOS 3.1 or later, Monochrome VGA monitor, 4 Mbyte RAM, 20 Mbyte hard disk, Microsoft Windows version 3.0, Mouse, Keyboard and 9-pin dot matrix printer.

Recommended Computer Configuration: PC-compatible 80386DX at 25 MHz, MSDOS 5.0, color VGA monitor, 8 Mbytes RAM, 100 Mbyte hard disk, Microsoft Windows version 3.0, mouse, keyboard and HP LaserJet III printer or equivalent.

DEVELOPER'S SYSTEM

Minimum Computer Configuration: PC-compatible 80386DX at 25 MHz, MSDOS 5.0, color VGA monitor, 8 Mbyte RAM, 100 Mbyte hard disk, Microsoft Windows version 3.0, mouse, keyboard and 9-pin dot matrix printer.

Recommended Computer Configuration: As above, but with HP LaserJet III printer or equivalent.

ACCESSORIES

630363: 0.5m IEEE Cable.
630364: 1m IEEE Cable.
630366: 2m IEEE Cable.
630388: GPIB Interface Card (2 required).

ORDER INFORMATION

Developer's Version
Runtime Version
Accessory 630363
Accessory 630364
Accessory 630366
Accessory 630388
Factory/FOB: Indianapolis, IN and Norwich, England

For full specifications or a demonstration consult your nearest Wavetek representative (page 146).

Accessories

- **Special purpose and general use leads**
- **Current Shunts**

1505 Single Input Lead Kit for 1362
The 1505 consists of 1.5m of screened, 4-core PTFE insulated cable. On one end of the cable, a female D-type connector mates with the input connector on the 1362 front panel, the other is terminated with five 4mm banana plugs.

1506 Ratio Input Lead Kit for 1362
The 1505 consists of two 1.5m lengths of 4-core PTFE insulated cable with two D-type connectors (1362 front panel) on one end and eight 4mm banana plugs on the other.

1508 4-wire coaxial AC Lead Kit
The 1508 lead kit connects any 4700, 4705, 4707 or 4708 calibrator to the 4920. Twin 0.6m lengths of coaxial AC lead are connected to a moulded box that connects to the calibrator terminals. An N-type tee piece is designed to connect (4-wire configuration) to the 4920 N-type input.

1509 2/4-wire coaxial AC Lead Kit
The 1509 consists of twin 0.75m lengths of screened coaxial cable that connects a moulded box (suitable for any 4700, 4705, 4707 or 4708 calibrator, selectable 2 or 4-wire) to a specially designed dual 4mm banana safety connector.

1510 General Purpose Lead Kit
The 1510 consists of one 1514, one 1513 and a fused probe set. The probe set is 1.2m long with push-on crocodile clips rated to 1000V rms.

1511 Kelvin 4-wire Resistance Lead Kit
The 1511 consists of 0.6m of shielded 4-wire PTFE cable with five 4mm banana plugs on one end and two Kelvin crocodile clips and a guard connector at the other.

1512 2/4-Wire Coaxial AC Lead Kit
The 1512 consists of twin 0.6m lengths of screened coaxial cable that connects a moulded box (suitable for any 4800, 4805 or 4808 calibrator, selectable 2 or 4-wire) to an N-type tee piece designed to connect to the 4920 N-type input..

1513 Screened 4-wire Coax AC Lead Kit
The 1513 consists of three 0.6m lengths of screened coaxial cable with three sets of specially designed dual 4mm banana plugs (shrouded for safety) at one end and two sets at the other.

1514 4-wire DC Lead Kit
The 1514 consists of 1.5m of screened 4-core PTFE cable, with five 4mm shrouded banana plugs at one end and three at the other.

1515 Wideband AC Lead Kit
The 1515 consists of 0.5m of low loss coaxial cable with a high quality N-type female connector at each end. An N-type (male) to BNC (female) adaptor is also included.

1516 General Purpose AC/DC Lead Kit
The 1516 consists of two 1m lengths of screened 2-core PTFE cable with a shrouded connector for a 4800, 4805 or 4808 calibratorat one end and five shrouded 4mm banana plugs at the other.

4921 Shunt Adaptor
The 4921 allows users of the John Fluke Mfg. A40 and A40A current shunts to be used with a 4920. The current shunt is plugged into the top of the adaptor and the output voltage is available at an N-type connector on the side of the 4921. Also included is an N-type to N-type cable and an N-type to dual 4mm banana adaptor. Note that the 4921 is not compatible with the 4920M. Size: 120mm X 80mm X 55mm.

4954 10A Shunt
The 4954 10A shunt is designed for calibration of high current sources. Its upper surface contains five 4mm banana sockets, two for the current input, two for the voltage output and one connected to the case. Size: 120mm X 80mm X 55mm. Nominal resistance: 10mΩ.

CS1 General Purpose Shunt Set
The CS1 consists of six plug-in shunts with nominal ranges from 10µA to 1A.

630363 0.5m GPIB Cable
630364 1m GPIB Cable
630366 2m GPIB Cable

ORDER INFORMATION
1505
1506
1508
1509
1510
1511
1512
1513
1514
1515
1516
4921
4954
CS1
630363
630364
630366
Factory/FOB: Indianapolis, IN & Norwich, England

TEST & MEASUREMENT INSTRUMENTATION 1992

Test & Measurement: Software, Arbitrary & Function Generators, Pulse Generators, VXI & Modular Instruments, Data Logging Systems RF & Microwave: Signal & Sweep Generators, Scalar Network Analyzers, CW & Peak Power Meters, Components Calibration Equipment: Calibrators & Standards, Precision Digital Multimeters Communication: CATV, Satellite & TV, Cellular & Two Way

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