datron WAVETEK

MODEL 4950

MULTIFUNCTION
TRANSFER STANDARD

Model 4950 Multifunction Transfer Standard

- **Supports all Datron models**
- **Transfers traceability directly to the calibrator output terminals for all ranges and functions**
- **Provides full automation of calibration process and data for Statistical Process Control techniques to define tailored certification intervals**
- **Specifically designed and constructed for extensive travel**
- **Provides "in-situ" calibration to drastically reduce calibrator downtime**

Latest methodology to meet today's requirements

Increasing performance levels of today's multifunction calibrators are placing such demands on traditional calibration methodology that users are now being forced to higher order 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.

Full traceability by transfer

The Model 4950 Multifunction Transfer Standards (MTS) is a compact microprocessor controlled instrument specifically designed for stability under transport conditions. It provides an independent 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 optimised performance envelope is restricted to pre-defined measurement points, each of which are separately calibrated.

The hardware contains no physically adjustable 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 to enable its performance to be readily monitored. "Certified" calibration constants are stored during comparison to standards for the specific calibration of the subject calibrators.

The transfer process is designed to operate in four stages shown in the diagam below:

As a simple example, the calibration uncertainty of the calibrator can be calculated by combining the following contributions:

(a) the calibration uncertainties of the MTS

(b) an allowance of time and temperature drift of the MTS during the transfer process

(c) the mean and standard deviation of the measurements made, both of which are reported by the MTS.

Statistical Process Control (SPC)

Standard statistical techniques can be applied to measurement data in the Excel environment to generate percentage confidence levels for the reported measurement uncertainties, or adjust the uncertainties reported to reflect a desired confidence level.

The data gathered by the software package details the instantaneous outputs of the calibrator along with the uncertainty with which they were measured. Data from this process can then be combined with data from previous transfers and Excel can then be used to determine historical drift rates of the calibrator.

Fully Automated

A software package is available to automate the calibrator calibration process, reducing the task from days of skilled engineer's time to just hours on an automated system. In addition to considerable time saving, automation provides a more repeatable process and is less prone to human error.

Data Management

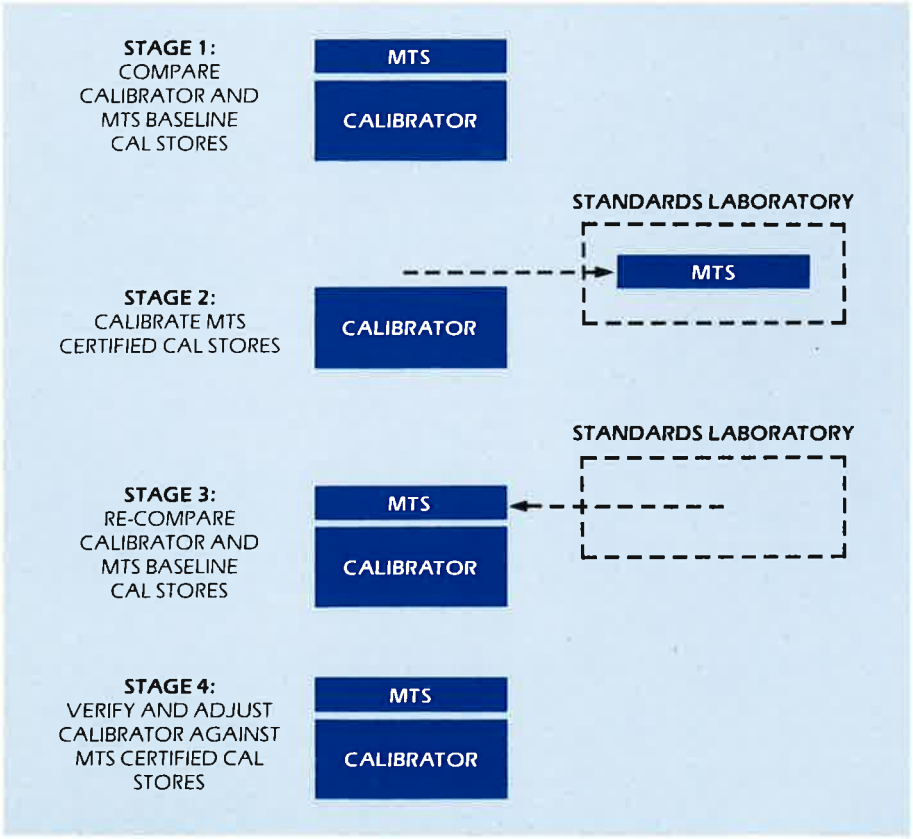
The software runs on an industry standard PC in the Windows 3 environment. Calibration data can be output on an ASCII format compatible with most word processors, or Microsoft's Excel spreadsheet package. Excel can be used to analyse the results and make any calculations required. The power and flexibility of Excel means that the only limitation is the user's imagination.

Reliability and support

The Model 4950 has been designed and built to the most exacting quality standards. Internal self diagnostic routines continuously monitor instrument status to facilitate servicing. These include a wide range of failure conditions – from the indication of invalid inputs to internal failures.

In addition a comprehensive selftest routine can be selected at any time to provide rigorous operational checks directing service actions to specific major circuit elements.

Carrying the full Datron warranty the Model 4950 comes with the complete back-up support and calibration facilities provides by our world-wide service centres.



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Specifications

Provisional 30 day Transfer Stability in PPM at 23°C ±1°C

Note: Specifications are ± ppm of reading valid for ± 10% of all amplitude and ± 1% of all frequency points.

Function	Transfer Points	Frequency	Transfer Stability ppm
DCV	± 100mV		3
	± 1V		2
	± 10V		1
	± 100V		2
	± 1kV		2
ACV	1mV & 10mV	10Hz	15 + 1μV
		20Hz	15 + 1μV
		30Hz	15 + 1μV
		40Hz	15 + 1μV
		55Hz	15 + 1μV
		300Hz	15 + 1μV
		1kHz	15 + 1μV
		10kHz	15 + 1μV
		20kHz	15 + 1μV
		30kHz	15 + 1μV
		50kHz	30 + 1μV
		100kHz	50 + 1μV
		300kHz	100 + 2μV
		500kHz	200 + 2μV
		1MHz	300 + 2μV
	100mV, 1V & 10V	10Hz	10
		20Hz	10
		30Hz	10
		40Hz	10
		55Hz	10
		300Hz	10
		1kHz	10
		10kHz	10
		20kHz	10
		30kHz	10
		50kHz	20
		100kHz	20
		300kHz	50
		500kHz	75
		1MHz	200
	100V	10Hz	10
		20Hz	10
		30Hz	10
		40Hz	10
		55Hz	10
		300Hz	10
		1kHz	10
		10kHz	10
		20kHz	10
		30kHz	10
		50kHz	20
		100kHz	20
		200kHz	25
	700V	100kHz	50
	1Kv	55Hz	15
		300Hz	15
		1kHz	15
		10kHz	15
		20kHz	15
		30kHz	15
DCI	± 100μA		7
	± 1mA		7
	± 10mAV		7

Function	Transfer Points	Frequency	Transfer Stability ppm
DCI continued	± 100mA		7
	± 1A		2
	± 10A		20
ACI	100 μA	10Hz	100
		20Hz	100
		30Hz	100
		40Hz	100
		55Hz	100
		300Hz	100
		1kHz	100
		5kHz	200
		10kHz	600
	1mA, 10mA, 100mA & 1A	10Hz	60
		20Hz	60
		30Hz	60
		40Hz	60
		55Hz	60
		300Hz	60
		1kHz	60
		5kHz	100
		10kHz	300
	10A	10Hz	200
		20Hz	200
		30Hz	200
		40Hz	200
		55Hz	200
		300Hz	200
		1kHz	200
		5kHz	300
		10kHz	600
		20kHz	1000
	Range	Transfer Points	
Resistance	10 Ohm	1 Ohm	14
		3 Ohm	10
		10 Ohm	5
		19 Ohm	5
	100 Ohm	30 Ohm	3
		100 Ohm	3
		190 Ohm	3
	1 kOhm	300 Ohm	3
		1 kOhm	3
		1.9 kOhm	3
	10 kOhm	3 kOhm	3
		10 kOhm	3
		19 kOhm	3
	100 kOhm	30 kOhm	5
		100 kOhm	5
		190 kOhm	5
	1 MOhm	300 kOhm	8
		1 MOhm	8
		1.9 MOhm	8
	10 MOhm	3 MOhm	12
		10 MOhm	12
		19 MOhm	12
	100 MOhm	30 MOhm	180
		100 MOhm	180

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General

LINE SUPPLY:	Power supply specs – 90v-145V or 187V-292V (selectable from rear panel) 46Hz-66Hz
POWER CONSUMPTION:	37VA maximum
DIMENSIONS (H x W x D):	88mm (3.46 ins) x 427mm (16.8 ins) x 480mm (18.9 ins)
WEIGHT:	13.5kg (30lbs)
INTERFACE COMPATIBILITY:	IEEE 488.1 for electrical interface spec and IEEE 488.2 for the syntax and protocols
EXTERNAL CURRENT SHUNT:	A 10A current shunt, Model No 4953, is available for the instrument. The characteristics of this shunt and its serial number will be entered into the 4950 during calibration
SIGNAL INPUT LEAD:	A Signal Input Lead will be provided with the instrument. The characteristics of this lead and its serial number will be entered into the 4950 during calibration.
SAFETY:	Designed to UL1244, IEC 348
WARRANTY:	1 year

Ordering Information

Model 4950	Multifunction Transfer Standard	DCV, ACV, DCI, ACI, Ohms
Option	40	Ruggidised transit case
Option	80	115V 60Hz line
Option	81	115V 50Hz line
Option	90	Rack Mount Kit
Option	95	Rack Mount Slides
Model 4953		10A Current Shunt

Datron Range

Datron Instruments leads the world in the design and manufacture of programmable calibrators, automated calibration systems and digital multimeters. Complementing the Datron Instruments range, other divisions within the Group are also engaged in the production of some of the world's finest test instruments. To assist you, data sheets are available with more detailed product information and full specifications. Contact us now and we will be pleased to send you the information you require.

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