

TEST & MEASUREMENT INSTRUMENTATION

1986
EDITION

Solartron Instruments



DIGITAL MULTIMETERS



DYNAMIC ANALYSIS & VIBRATION TESTING



DATA ACQUISITION/LOGGING



COMMUNICATIONS TESTING

SOLARTRON TEST & MEASUREMENT INSTRUMENTATION...

Innovative design and sound engineering are the keys to an advanced technology for today's most demanding applications.



DIGITAL MULTIMETERS Pages 3-6

Since introducing the world's first digital voltmeter nearly 30 years ago, Solartron has followed a continuous development program to maintain its position of leadership. Today we offer a comprehensive range of instruments for production, laboratory, and ATE requirements—including the world's most accurate 8-½ digit multimeter with unrivalled linearity and transfer accuracy.



DATA ACQUISITION/LOGGING Pages 7, 8

Solartron produced the first data logger in 1952. From that experience comes the present Orion Series of data loggers that are the accepted industry standards for research and industrial applications, as well as the new IBM® PC-based Model 3595 Isolated Measurement Pods (IMPs). Designed for on-site location in remote and harsh environments, or in the laboratory/R & D arena, each IMP can monitor up to 20 channels and up to 30 IMPs can be networked by an inexpensive 2-wire link.

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DYNAMIC ANALYSIS AND VIBRATION TESTING Pages 9-12

Solartron has a long history of innovative instrumentation in the fields of control engineering, structural, vibration, and acoustic analysis, rotating machinery diagnosis, and electrochemistry. Our latest range of instruments all incorporate the powerful capabilities of microprocessors for ease of operation and extensive data reduction and analysis, as well as application oriented software.



COMMUNICATIONS TESTING Pages 13-15

Solartron's communications testers are designed for easy bench operation, but all can be computer controlled via the IEEE-488 interface bus for high volume ATE applications. Consisting of a high performance AM/FM/ΦM signal generator, all-in-one automated radio telephone test set, rf service monitor, and a cellular radio test system, these instruments combine outstanding performance with operator convenience.

DIGITAL MULTIMETERS



Solartron digital multimeters are available in a complete family of models with resolutions from $3\frac{1}{2}$ digits all the way to the world's most accurate $8\frac{1}{2}$ digits. One is exactly suited to your application.

All Solartron digital multimeters feature the exclusive and patented pulse-width analog-to-digital conversion technique. Solartron was a co-developer of the once popular dual-slope method but discarded it nearly ten years ago in favor of the vastly superior pulse-width system. Unlike dual-slope and its derivations, including successive approximation and recirculating techniques, pulse-width conversion does not require periodic disconnection of the input signal. During the entire measurement, Solartron digital multimeters are observing what the input signal is doing. Should a transient occur it will be included in the result or if a momentary overload occurs

the current measurement is aborted and a new measurement cycle started. The result is a truthful average of the input during the integration time. By choosing different integration periods, the user can take advantage of the attractive trade-off of resolution with measurement speed. A precision reference supply with a polarity balance arrangement assures perfect correlation between positive and negative inputs. The typical sources of error due to dielectric recovery, amplifier slew, switch delay and correct zero detection are not present and, thus, are of no consequence with Solartron's A-to-D technique.

All Solartron digital multimeters are equally at home on the bench or the bus, thanks to an integral IEEE-488 interface. Several models offer an additional RS 232C interface, as well as scanning capability for systems applications.

DIGITAL MULTIMETERS

7081/7071... HIGHEST ACCURACY AND RESOLUTION



Both instruments provide identical facilities for measurement, data processing and storage, and remote control. The 8½ digit 7081 is the world's most accurate digital multimeter, with unsurpassed resolution, linearity, and transfer accuracy. It provides Standards Room Integrity for everyday measurements. The 7½ digit 7071 is the ideal choice for ATE applications with demanding requirements.

A comprehensive package of processing programs includes: multiply, linear scaling and offset; maximum, minimum, and peak-to-peak; high and low limits with alarm output; statistics for mean, variance, standard deviation, and rms; and ratio. Digital filtering provides a continuous average, average of n results, or a walking window average of the most recent n results. Up to 1500 readings can be stored in a fail-safe history file for later printout or processing.

See page 6 for specifications.

7060... CUSTOM CONFIGURED MULTIMETER

Here is a high performance 6½ instrument that can be configured to meet exact test function requirements. Four versions provide:

- dc voltmeter
- dc/ac (rms) voltmeter plus ratio
- full multimeter (ac mean) plus ratio
- full multimeter (ac rms) plus ratio

See page 6 for specifications.

7010... COST EFFECTIVE, HIGH SPEED 16-CHANNEL SCANNER

The 7010 provides 16-channel scanning at a switching rate of 130 channels per second. Designed to work with the models 7081, 7071, and 7060, and capable of being "daisy-chained" for up to 256 channels, the 7010 can communicate with a controller via an RS 232C link or on the IEEE-488 bus.

DIGITAL MULTIMETERS

7061...FAST ATE MULTIMETER WITH SCANNING CAPABILITY



When speed is critical, the 7061 is the choice. Capable of capturing up to 1500 readings per second into an internal memory of up to 8000 readings, providing an output of 300 readings per second on the IEEE-bus, responding within 3 milliseconds of an external trigger and signaling an alarm condition within 1 millisecond, the 7061 is both fast and accurate. Using a capture feature, results may be tracked until a defined input level is detected. Tracking continues until a specified number of results have been collected. Memory then contains a record of results, before and after the desired event. An extensive math and statistics package can then produce results in exactly the format required. A ratio function allows for the comparison of any measurement to any other measurement.

A built-in scanner option houses 16 channels in addition to the main and reference inputs. All 18 channels may be scanned in any sequence at a rate of 300 channels per second. Each of the channels can be set for any measurement function, delay and scale length, as well as math programs. If the scanner is not fitted, the 16 channels are recognized as "virtual channels". This gives access to various combinations of programs, allowing a single input to be manipulated in various ways. See page 6 for specifications.

7151/7150...HIGH PERFORMANCE AT MODERATE COST

These two multimeters both offer performance and operating convenience far in excess of their moderate cost. The 7150 and 7151 are both full function multimeters with up to 6½ digits resolution and similar specifications. The 7151 adds the ability to make accurate temperature measurements, as well as a stored history file of 500 readings and a powerful math and statistics package which can be preprogrammed for data processing and reduction. The 7151 also provides an oscilloscope output for viewing the last 100 readings for trend analysis and a zoom feature which allows for detailed analysis of a portion of that trend.

See page 6 for specifications.



DIGITAL MULTIMETERS

SPECIFICATIONS (accuracy in % reading + digits)

Parameter	7081 (8½ digits)	7071 (7½ digits)	7061 (7½ digits)	7060 (6½ digits)	7151 (5½ digits)	7150 (5½ digits)
Volts, dc						
Range	10 nV-1000 V	10 nV-1000 V	100 nV-1000 V	1 μ V-1000 V	100 nV-1000 V	1 μ V-1000 V
Accuracy	0.00012 + 4	0.0003 + 10	0.0005 + 2	0.002 + 6	0.002 + 3	0.002 + 5
Volts, rms ac						
Range	1 μ V-750 V	1 μ V-750 V	1 μ V-750 V	1 μ V-750 V	1 μ V-750 V	10 μ V-750 V
Frequency	dc-1 MHz	dc-1 MHz	10 Hz-500 kHz	40 Hz-50 kHz (7060E) 10 Hz-100 kHz (7060G)	10 Hz-500 kHz	10 Hz-300 kHz
FS Crest Factor	5	5	10	4 (7060E) 5 (7060G)	10	7
Accuracy	0.005 + 50	0.005 + 50	0.05 + 20	0.03 + 20 (7060E) 0.05 + 50 (7060G)	0.05 + 20	0.1 + 70
Volts, mean ac						
Range	—	—	—	1 μ V-750 V	—	—
Frequency	—	—	—	40 Hz-50 kHz	—	—
Accuracy	—	—	—	0.03 + 20 (7060C)	—	—
Current, dc						
Range	—	—	1 μ A-2A	1 nA-1A	10 μ A-2A	10 μ A-2A
Accuracy	—	—	0.02 + 10	0.04 + 10 (7060C/G)	0.02 + 3	0.02 + 5
Current, ac						
Range	—	—	10 μ A-2A	1 nA-1A	10 μ A-2A	10 μ A-2A
Frequency	—	—	40-440 Hz	40 Hz-5 kHz	40-440 Hz	40 Hz-5 kHz
Accuracy	—	—	0.05 + 20	0.08 + 40 (7060C/G)	0.05 + 20	0.1 + 100
Ohms						
Range	10 $\mu\Omega$ -1000 M Ω	10 $\mu\Omega$ -1000 M Ω	100 $\mu\Omega$ -1000 M Ω	1 m Ω -100 M Ω	10 m Ω -20 M Ω	100 m Ω -20 M Ω
Accuracy	0.00015 + 4	0.0003 + 10	0.0007 + 3	0.002 + 6	0.003 + 3	0.004 + 5
Temperature						
Range	—	—	-200 to + 600°C	—	-200 to + 600°C	—
Resolution	—	—	0.001°C, F, or K	—	0.01°C, F, or K	—

DATA ACQUISITION/LOGGING

3530 ORION SERIES... MULTI-TASKING AND INTELLIGENT



The Orion Series is ideally suited for structural analysis, agricultural research, battery, engine and materials testing, temperature and strain measurements in the aerospace and transportation industries, environmental disturbance testing, turbine alarm monitoring, and process control monitoring in the food, chemical, beverage, and printing industries. Both the 3530A and 3530 Delta feature 200 channel capability in one box (400 or 600 channels with slave scanners), up to 500 channels per second switching speed with full normal mode rejection of ac interference at sampling rates of 40 channels per second, up to 8 independent and prioritized tasks (separate or interrelated), powerful math and statistic programs for data reduction, digital and analog outputs for alarm and control functions, magnetic storage of data and operating programs, and a built-in alphanumeric printer. Both a real time clock and memory are battery maintained for power fail protection and recovery. Although all input and output modules are compatible with both the 3530A and the 3530 Delta, it is the computing power built into the 3530 Delta which is the basic difference between the two units. Using a Basic-like language, simple inter-channel calculations or sophisticated data reduction and output control can be easily implemented.

Both instruments accept inputs from voltage and current sources (dc and ac), thermocouples and RTDs, strain gages in $\frac{1}{4}$, $\frac{1}{2}$, or full configurations, magnetic and optical sensors, status and events, and time periods and frequency. Input conditioning is software controlled, allowing inputs to be freely mixed or altered to fit a new application.

SPECIFICATIONS, 3530A AND 3530D

Analog inputs

Switching	Reed relay or solid-state
DC voltage	1 μ V-100 V
AC voltage	1 μ V-20 V
Current	DC or AC
Resistance	2 or 4-wire
Thermocouples	E, J, K, R, S, and T
RTD	100 Ω 4-wire
Strain gages	$\frac{1}{4}$, $\frac{1}{2}$, or full-bridge

Digital inputs

Frequency	Up to 400 kHz
Period and interval	500 μ s-60 min.
Totalize	Up to 32 bits ($>4 \times 10^9$)
Status	Single bits or BCD
Events	Single, counted, or totalized

Outputs

Analog	0-10 V, or 4-20 mA
Digital	Switched outputs for HI or LO alarm at any channel input

Interfaces

Standard	RS 232C
Optional	RS 422 or IEEE-488

Option

3530B/F	Blank panel version of 3530A/D for computer control; no magnetic storage or printer.
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DATA ACQUISITION/LOGGING

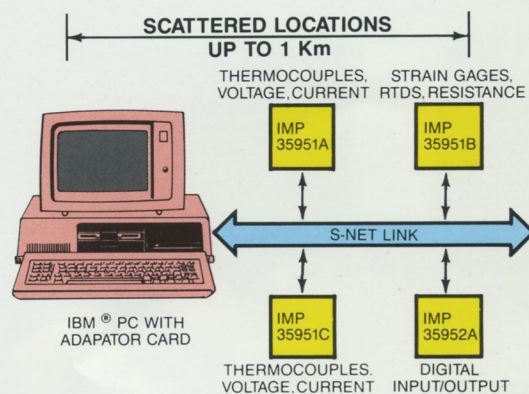
3595... ISOLATED MEASUREMENT PODS (IMPs) FOR IBM PC



Solartron IMPs under IBM® PC control are ideal for data acquisition and logging in harsh industrial environments. Housed in a sealed NEMA 4X enclosure, and with an operating temperature range from -20°C to $+70^{\circ}\text{C}$, an IMP can be mounted directly at the point of measurement and provide up to 20 channels of high precision analog or digital data acquisition. Up to 30 IMPs can be computer controlled over a simple 2-wire S-Net serial link with a data transmission speed of 163,000 bits per second. All IMPs derive their power from the same S-Net link.

IMPs operate in a polled environment which insures that up to 600 channels can be triggered, measured and the results returned to the host computer in 1 second.

Each IMP is transformer coupled to S-Net for 500 V isolation and high power line noise immunity. On-board intelligence performs automatic drift corrections and provides full signal conditioning for strain gages, RTDs, thermocouples, dc voltage and current, and resistance, with results converted to engineering units before transmission.



IMP Type	35951A Analog	35951B Analog	35951C Analog
Function:	Thermocouples, voltage, current	Strain gages, RTDs, voltage, resistance	Thermocouples, voltage, current
Channels:	20	10	20
Switching:	3-pole FET	6-pole FET	3-pole reed
Voltage, dc:	1 μV -12 V	1 μV -2 V	1 μV -12 V; 10 μV -100 V, optional
Current, dc:	Shunt dependent, 10 nA-20 mA nom.	N/A	Shunt dependent, 10 nA-20 mA nom.
Resistance:	N/A	2 m Ω -2.5 k Ω	N/A
Temperature:			
Thermocouple	E,J,K,T,R,S		E,J,K,T,R,S
RTD		100 Ω 4-wire	
Strain:	N/A	¼, ½, and full bridge	N/A

IMP Type	35952A Digital
Function:	Digital Input/Output
Channels:	20
Status (0 and 1):	0.8 and 2.0 V, or 3.0 and 9 V
Frequency:	
Maximum	49 kHz
Gate times	0.01, 0.1, 1, and 10 s
Period:	
Range	1,10,100, and 1000
Resolution	10 μs
Events, resolution:	10 ms
Counts:	24 bits ($> 16 \times 10^6$)
Output:	
Type	FET, closes for logic 1
Withstand	60 V, max.
Sink	100 mA, max.

DYNAMIC ANALYSIS & VIBRATION TESTING

1286...POTENTIOSTAT/ELECTROCHEMICAL INTERFACE



For the study of electrochemical reactions (including corrosion), the testing of protective coatings, battery design and the investigation of dielectric materials and biological phenomena, the properties are ideally characterized by measurement of electrical impedance or resistance.

The 1286 is a general-purpose potentiostat with a wide range of facilities for measurement and analysis of dc and ac impedance. As a stand-alone instrument, the 1286 provides automatic dc potential sweeps. Used with the 1250 Frequency Response Analyzer or the 1201 Signal Processor, an ac waveform can be superimposed on the internally-generated voltage and the impedance determined directly from the resultant current and voltage response.

Measured data can be displayed on the two built-in digital voltmeters, stored in non-volatile memory, or output to a peripheral device (plotter, printer, computer) for analysis.

FEATURES:

- Compatible with 2-, 3- and 4-terminal cells
- Potentiostatic and galvanostatic polarization control
- IR compensation: current interruption and positive feedback compensation of ohmic drop
- Real part correction: corrects ohmic drop and improves measurement resolution
- Wide bandwidth: dc to 1 MHz
- Safe polarization sequence: protects cell from unwanted transients
- Interfaces: GPIB (IEEE 488), RS 423 and RS 232
- Non-volatile memory: data and measurement parameter files

DYNAMIC ANALYSIS & VIBRATION TESTING

1250 SERIES...FREQUENCY RESPONSE ANALYZERS



The 1250 series Frequency Response Analyzers use the single sine correlation analysis technique to provide fast and precise measurement of the amplitude and phase characteristics of the device under test. The device can be stimulated with a sine, square or triangular waveform from the built-in generator. For self-excited devices, the 1250 can be synchronized to an external reference to determine the harmonically related response characteristics.

The 1250 covers a wide frequency range, from 10 μ Hz to 65 kHz. The correlation technique enables either rejection or analysis of the harmonic components of a non-linear system response and also the accurate measurement of signals, even when heavily contaminated with noise.

The 1250 contains two analysis channels, enabling the complex ratio of any two signals from a system to be determined. This is particularly suited to derivation of simple input/output relationships or the measurement of electrochemical impedance, when used in conjunction with the 1286 Potentiostat.

For multi-output systems the 1254 Analyzer provides simultaneous measurement on four channels. Additionally, both the 1250 and 1254 can be expanded in blocks of 8 channels to an

additional 32 parallel channels using 1251 Slave Analyzers. Multichannel operation is ideal for modal analysis of structures and condition monitoring of rotating machinery.

FEATURES:

Frequency range	10 μ Hz to 65 kHz
Channels, 1250	Simultaneous measurement on 2 channels
Channels, 1254	Simultaneous measurement on 4 channels
Generator	Triangle, square, sine
Generator output	10 mV to 10 V
Measurement	1 μ V to 300 V

1251 Slave Analyzers

Channels for simultaneous measurement: 1 to 32
Interface: Independent IEEE 488

Options

Modulator/Demodulator for carrier systems
Synchronizer system
Auxiliary generators (0°, + 90°, + 180°)
Analog plotter interface

DYNAMIC ANALYSIS & VIBRATION TESTING

1201 SIGNAL PROCESSOR...MORE THAN A SPECTRUM ANALYZER



The 1201 is a 500 line dual-channel spectrum analyzer with a bandwidth of 30 kHz and resolution down to 2 mHz. A wide range of single and dual channel functions is available, including auto- and cross-power spectra, synchronous spectrum, transfer function and coherence in the frequency domain and auto- and cross-correlation, time record and impulse response in the time domain. A second Fourier transform, of the auto power spectrum, also provides the power cepstrum for the study of periodicities in the frequency domain. Baseband, zoom and octave measurements are provided, while a unique true logarithmic analysis mode optimizes the resolution, particularly at low frequencies, when analysis is required over wide bandwidths.

The 1201 features a 3 1/2" dual-sided floppy disk for storage and recall of instrument setups and data. Up to 650 Kbytes can be stored in a format compatible with HP computer systems. An application software package is available for modal analysis, including SDOF and MDOF curve fitting, animated mode shapes, structural modification and response prediction. Another acoustic intensity package provides 3-D measurements; contour, vector, and 3-D animated displays, and phase/magnitude correction. A rotating machinery software package allows balancing and trend analysis.

Display features include the ability to present split screen waterfall records, as well as the usual Bode and Nyquist formats. Hard copies of the displays can be obtained using analog or digital plotters, or a video hard copier. The video

output can also be used to reproduce the display on a remote monitor.

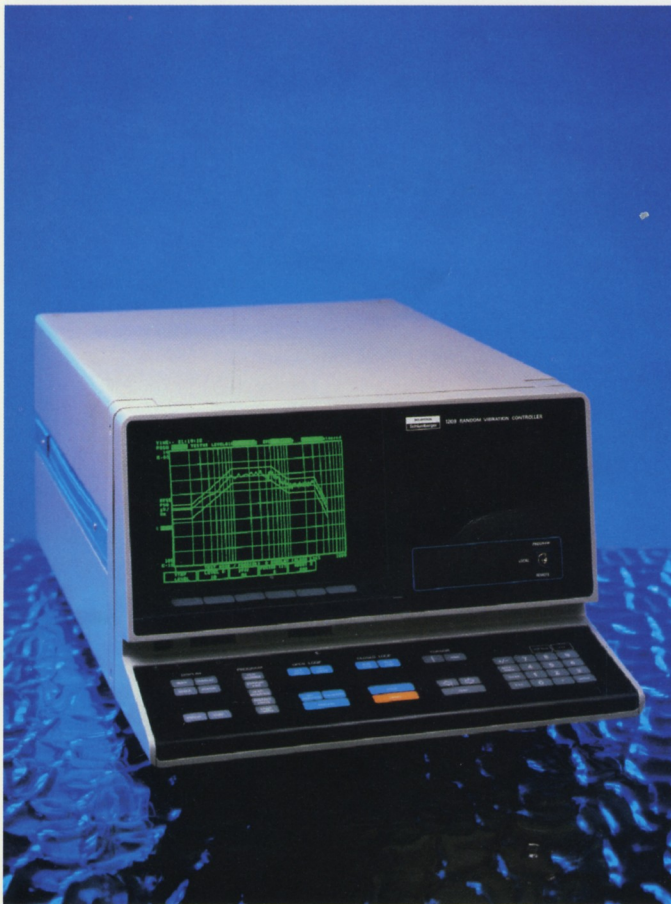
Where external stimulation of the system under investigation is required, an integral generator provides pseudo-random noise, periodic multi-sine and impulse excitation.

FEATURES:

Frequency range	DC to 30 kHz
Spectral lines	500
Windows	Uniform, Hanning, and Flat Top
Averaging modes	RMS, exponential, time and peak hold
Single channel functions	Auto-power spectrum, synchronous spectrum, auto-correlation, time record and power cepstrum
Dual channel functions	Cross-power spectrum, transfer function, coherence, cross-correlation and impulse response
Computed functions	Power in band, equivalent noise bandwidth
Display formats	Linear, logarithmic, power spectral density, phase, real and imaginary, Nyquist, octave, 1/3 octave, and waterfall
Option	IEEE 488 interface Analog plotter interface

DYNAMIC ANALYSIS & VIBRATION TESTING

1209/1210...RANDOM VIBRATION CONTROLLER



Two Random Vibration Controllers provide all the facilities necessary to achieve adaptive loop control, or equalization, of a random excitation signal to match a user-defined demand spectrum. The 1210, with a frequency range of 6 Hz to 3 kHz, is ideal for military and aerospace applications in accordance with MIL-STD 781C(D), 810C(D), and NAVMAT P9492. The 1209, with a frequency range of 1 Hz to 500 Hz, is designed for packaging and vehicular environmental testing and conforms to ASTM packaging test procedures.

Both instruments allow up to 8 tests to be programmed and stored from the front panel for easy recall. Each test includes automated calibration results, demand test spectrum, level sequence data, and alarm/abort requirements.

Full system interlocking and alarm limits are incorporated to insure a safe test. During the vibration test the instruments continuously monitor the incoming signals for failure due to breakages and for high amplitude spectral components that exceed programmable abort and alarm spectral limits. If these limits are exceeded, the Model 1209 or 1210 can be made to produce an audible signal or, in the case of a breakage being detected, to shut down the system in a controlled manner.

The 1209/1210 can also be used in an open loop mode, as a real time FFT spectrum analyzer, for estimating system transfer function or for general signal analysis.

Both instruments feature a large 9 inch CRT display giving clear, high resolution pictures. The display is used to monitor time and frequency spectrums of the test data. Fully annotated, the display provides accurate information about the spectral data and visual checks on the progress of the equalization process.

A video output is provided, as standard, for driving video hard-copying devices or large screen TV sets. Options are available to copy the results onto analog or digital type plotters. An optional IEEE 488 interface provides for full remote control.

FEATURES:

	1209	1210
Frequency range	1-500 Hz	6 Hz-3 kHz
Resolution, 500 lines	1 Hz	6 Hz
Dynamic range,		
power spectrum density	>65 dB	>65 dB
Accelerometer inputs	Charge or voltage	
Generator output	Pseudo-random binary sequence (PRBS) with gaussian amplitude probability density function	
Demand profile	Up to 99 breakpoints/levels in 8 profiles	
Protection facilities	Abort and alarm limits, "graceful" power up and down, external interlocks, front panel keyswitch	
Option	IEEE 488 interface Analog plotter interface	

COMMUNICATIONS TESTING

4002 . . . LOW NOISE, HIGH PERFORMANCE SIGNAL GENERATOR



The 4002 signal generator is a high performance instrument equally at home on the bench or, with an optional IEEE 488 bus interface, in an ATE system. Its performance features make it suitable for a range of applications:

- **High spectral purity** for intermodulation and adjacent channel measurements of quality receivers
- **Reverse power protection** for transceiver applications
- **Quality frequency modulation** suitable for testing of stereo receivers
- **Wide deviation FM** for wide-band telephony services
- **Low radiated leakage** for testing of sensitive handheld pagers
- **External DC input** for frequency shift keying applications
- **Controlled AM phase response** for VOR system measurements

The 4002 is extremely easy to use. An alphanumeric display provides independent readouts of frequency, amplitude, modulation, and modulation frequency. Settings are entered via the keyboard in the sequence of function, data, and dimension. An incorrect entry produces an appropriate comment to prompt the operator. Settings may also be varied in user-selected steps or continuously by a rotary control. Up to 30 complete front panel setups can be stored in a non-volatile memory and recalled as desired.

FEATURES:

Frequency:	
Range	0.1 to 1000 MHz (option to 2.1 GHz)
Resolution	10 Hz
Switching time	20 ms
RF Output:	
Range	-138.9 to +13 dB
Display	dBm, dB μ V, μ V or mV
Resolution	0.1 dB
Switching time	50 ms
Spectral Purity:	
Phase noise	< 136 dBc/Hz, 25 kHz offset to 480 MHz < 130 dBc/Hz, 25 kHz offset to 1000 MHz
SSB noise floor	< 145 dBc/Hz, 20 to 1000 MHz
Amplitude Modulation:	
Range	0 to 99.9%
Resolution	0.1%
Bandwidth	dc to 100 kHz, 20 to 1000 MHz
Distortion	< 3% to 70% am
Frequency Modulation:	
Max. deviation, to 20 kHz mod rates	800 kHz, to 20 MHz, 60-120 MHz, 480-1000 MHz; 400 kHz, 20-60 MHz, 240-480 MHz; 200 kHz, 120-240 MHz dc to 100 kHz
Bandwidth	< 1% at < 15 kHz mod rates and < 50 kHz dev.
Distortion	
Phase Modulation:	
Range	0.01 to 99.9 rad
Bandwidth	250 Hz to 100 kHz
Digital Sweep:	
Modes	Auto, Single, Manual
Parameters	Start and stop frequency, step width, and step speed
Options:	
	IEEE 488 bus interface; 2.1 GHz frequency extension

COMMUNICATIONS TESTING

4040/4039... TRANSCEIVER TEST IN LESS THAN 2 MINUTES



The 4040 Communications Test Set is the first compact instrument that can completely characterize a transceiver in less than 2 minutes, including adjacent channel selectivity to CCITT and MPT/DTI regulations. Equally useful for production testing and quality assurance, as well as field diagnosis and servicing, the 4040 can serve as a manual test set, as an automatic test station using a unique learning mode or its own programming keyboard and memory, or as the heart of an ATE system under computer control. The optional minicassette can store up to 18 different test files, with 50 program steps per file, for instant recall.

The 4039 is a low cost version of the 4040, identical in capability, except that there is no provision for AM measurements or wideband FM, and phase noise is < 122 dBc/Hz with 25 kHz offset. Mini-cassette storage is optional in the 4039.

FEATURES:

Receiver Measurements

Carrier range	0.4-960 MHz
RF output	0.1 μ V-2V
Phase noise, 25 kHz offset	< -132 dBc/Hz (4040) < -122 dBc/Hz (4039)
Frequency modulation	0-20 kHz
Amplitude modulation	0-90% (4040 only)
Phase modulation	0-6 rad

Transmitter Measurements

Carrier range	30 kHz-960 MHz
Input level	10 μ W-50 W
Frequency modulation	0-50 kHz (2-960 MHz)
Amplitude modulation	0-99% (4040 only)
Phase modulation	0-6 rad (2-960 MHz)

Additional Features

SINAD meter	1-46 dB
Distortion meter	0.1-99%
AF voltmeter	0.2 mV-30 V
DC voltmeter	0-50 V
DC ammeter	0-15 A

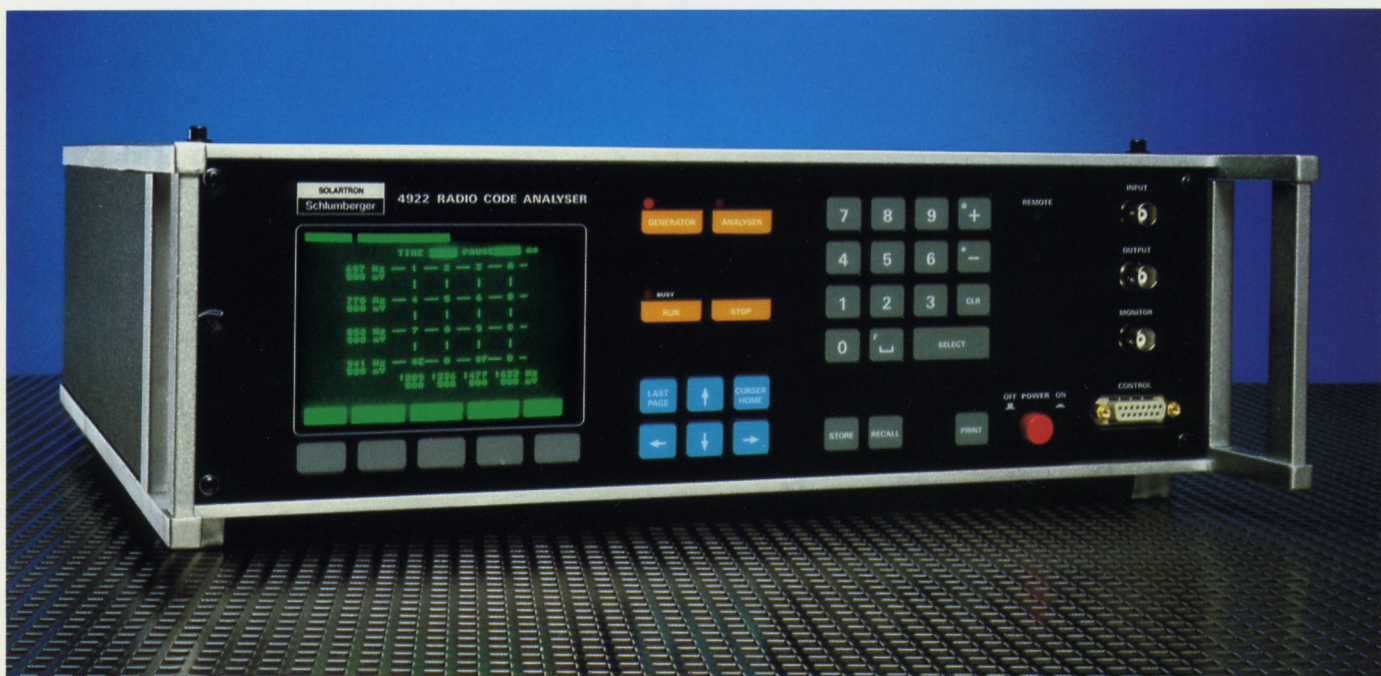
Options

IEEE 488 bus interface	For external printer and connection to controller/4922
Cassette recorder	For storage of test sequences
Adjacent channel power meter	For all selective RF levels including harmonics and spurious signals
Duplex meter	For repeater measurements and full-duplex operation (4922)
Control interfaces	32-relay unit to control peripheral devices or UUT and to set radio channels with BCD code. 5-relay unit to control Rx/Tx, squelch on/off, upper/lower band and coder/decoder of tone sequences
Stabitexter	Write and store free-form comments
Rack mounting kit	19" conversion kit to rack mounting
Transport case	Carrying case with shock absorption

COMMUNICATIONS TESTING

Solartron Instruments

4922...UNIVERSAL RADIO CODE ANALYZER (WITH CELLULAR CAPABILITY)



The Model 4922 provides simultaneous signal generation and analysis of selective call and coded data messages, including the complete test of cellular radio systems. Cellular test routines include AMPS (U.S.), TACS (Britain), NMT (Scandinavia), NMT (Austria), and C-net (Germany). All parameters, such as tone frequencies, SAT tones, and baud rates, are menu-driven. Other routines can be fully duplex-simulated and the user has access to different simulation levels from the simple-to-enter subscriber numbers and reduced bit-level manipulation of each individual bit. Results are available in either hexadecimal or binary format on a CRT display or optional printer.

In addition to cellular systems, the 4922 can test sequential call tone systems, with built-in tone sequences, for ZVEI 1, ZVEI 2, CCIR, CCITT, EEA, EIA, VDEM, EURO, NATEL, and up to 5 user-specified call series. Up to 28 sequential tones can be set with specified frequencies, tone amplitudes and durations, and time pauses between tones. Each tone can be combined with a simultaneous second tone, audible or sub-audible. Pager systems may also be addressed and analyzed, including POCSAG, Motorola Golay, and NEC binary formats.



The 4922 can be used with any existing full duplex service monitor to form a complete RF test system. The Solartron 4062 integrates the 4922 with either the 4040 or 4039 RF Service Monitor to provide a completely automatic and universal test set capable of RF and data stream message testing down to bit level. The 4062 provides unparalleled testing capability of land mobile, 2-way radios, pagers, and cellular radio telephones.



Solartron service and calibration is backed by over 20 years of metrological history and direct traceability to national standards. In the measurement of the volt, which is essential to the calibration of electronic instruments, Solartron is one of the few manufacturers in the world with a certified uncertainty of 1 microvolt.

Computers are used extensively at Solartron Service Centers for fault analysis and final checks on repaired instruments. All instruments are subjected to a "dynamic soaking" process of up to 2 days to minimize the possible recurrence of the fault or other associated failure.



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