Multiple Instrument Station Module

Digital Storage Oscilloscope

Vertical

Channels	2 + external trigger
Sampling rate	50MS/s (5GS/s ERS mode)
Bandwidth	> 100MHz
Coupling	AC, DC, GND
Input impedance	1M Ohm, 25pF
Vertical sensitivity	20mV to 2V per division
Vertical resolution	8 bits
Max. input voltage	100VDC

Horizontal

Sweep speed	5ns/div to 5s/div
Memory	64kbytes/channel
Modes	normal, auto, single

Internal trigger

Source	channel 1, channel 2, function generator
Slope	positive, negative
Sensitivity	< 0.5 divisions
Coupling	AC, DC, HF reject, LF reject

External trigger

Input impedance	1M Ohm, 25pF
Slope	positive, negative
Sensitivity	< 10mV
Coupling	AC, DC, HF reject, LF reject
Max. input voltage	100V DC

Trigger delay

Pre-trigger	0 to 100% of sweep time
Post-trigger	0 to 100% of sweep time

Measurements

Automatic	standard waveform parameters
Comparison	time and voltage

Function Generator

Waveforms	sine, square, triangle, single-shot pulse
Frequency range	0.1Hz to 10MHz, resolution 0.1% of range full scale
Pulse width	100ns to 10s
Modulation modes	AM, FM, PWM
Modulation frequency	400Hz internal
Duty cycle	20% to 80%, resolution 1%
Amplitude	0V to 5V, resolution 50mV
DC offset	-7.5V to 7.5V, resolution 50mV
Rise/fall time	25ns
Output impedance	50 Ohm

Sweep mode

Start frequency	0.1Hz to 10MHz
End frequency	0.1Hz to 10MHz
Steps	1 to 1000
Time per step	0.1s to 9.9s

Digital Floating Multimeter

Channels	2 channels
Input impedance	10M Ohm
Statistics	minimum, maximum, average

Channel 1

Modes	DC volts, AC volts
Voltage range	0 to 400V
DC voltage resolution	0.005% full scale
DC voltage accuracy	+/-0.05%
AC voltage resolution	0.05% full scale
AC voltage accuracy	+/-0.1%

Channel 2

Modes	DC volts, AC volts, DC current, AC current, resistance
Voltage range	0 to 400V
Current range	0 to 2A
Resistance range	0 to 20M Ohm
DC voltage resolution	0.005% full scale
DC voltage accuracy	+/-0.05%
AC voltage resolution	0.05% full scale
AC voltage accuracy	+/-0.1%
DC current resolution	1mA
DC current accuracy	+/-0.1%
AC current resolution	1mA
AC current accuracy	+/-0.2%
Resistance resolution	0.01% full scale
Resistance accuracy	+/-0.1%

Auxiliary Power Supply

Output Voltages	+5V, +9V, -9V
Output Current	+5V supply - 500mA +9V supply - 100mA -9V supply - 100mA

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Barnsley S75 3SP
South Yorkshire
United Kingdom
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Multiple Instrument Station (continued)

Frequency Counter

Modes	event, frequency, pulse width

Channel 1

Impedance	50 Ohm
Frequency range	1MHz to 150MHz
Sensitivity	< 5mV rms @ 2MHz to 10MHz <15mV rms @ 10MHz to 100MHz
Pulse response	50mV, 25ns pulse @ 500Hz
Maximum input	+/- 5V
Basic accuracy	+/- 0.02% +/- 1 count

Channel 2

Impedance	1 MOhm
Frequency range	2Hz to 100MHz
Sensitivity	< 300mV rms @ 10Hz < 150mV rms @ 10kHz to 10MHz < 350mV rms @ 33MHz
Maximum input	200V rms
Basic accuracy	+/- 0.02% +/- 1 count

Event Mode

Ch1 event count	0 to 9,999,999,999
Ext gate width	minimum 20ns
Ext gate width time	6 hours, 10ms resolution 10.74s, 5µs resolution 84ms, 40ns resolution
Statistics	lowest, highest, average
Display	frequency, period, RPM events, pulse width, gate time

Universal I/O

Number of channels	4 channels

Analogue Channels

Modes	voltage output, voltage input, current output, current input
Voltage output range	-9V to +9Vm resolution 10mV
Voltage input range	-10V to +10V, resolution 10mV
Current output range	0 to +/-20mA, resolution µA

Digital Channels

Modes	logic output high, logic output low logic measurement
Voltage	TTL compatible logic levels

Accessories

Output voltages	2 x DSO probes 1 x yellow probe and cable 1x blue probe and cable 1x black probe and cable 1x universal I/O cable (not terminated)

Options

Internal fitting	PCI Interface
External fitting	- MultiLink case (cost option) with USB - External case (cost option) which will hold up to 5 System8 modules (USB interface).
PC Requirements	Pentium (1GHz) System Windows XP™ 20MB of free hard disk space 256 MB RAM CD ROM Drive

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24 channel Analogue IC Tester Module

V-I test capability

Number of test channels:	24 + 2 probes and references
Test voltage:	2 V to 50 V peak to peak
Voltage resolution:	8 to 12 bits
Test frequency:	37.5 Hz to 12 kHz
Test current:	1 µA to 150 mA
Source impedance:	100 Ohm to 1 M
Test waveforms:	Sine, square, triangle, ramp, pulse
Waveform modes:	V-I, V-T, I-T
Waveform display:	Multi-plot with single waveform zoom
Waveform comparison:	Automatic comparison algorithm for good and bad boards using live probes or disk
V-I comparison tolerance:	50 mV to 500 mV with 50 mV resolution
Package support:	DIL, SOIC, PLCC, QFP and variants with MultiProbes
Pulse output:	Positive, negative or bipolar for thyristors/ triacs
Pulse amplitude:	Adjustable to +/-10 V
Calibration:	Can be calibrated by user

Analogue functional test capability

Number of I/O channels:	24 independent + 3 special discrete channels
Driver voltage:	-12 V to +12 V
Driver voltage resolution:	10 bit
Driver output current:	200 mA max sink or source
Driver states:	Voltage source, current source, off
Discrete source current:	10 µA - 150 mA. (driving a load returned to 0 V)
Driver source impedance:	34 Ohm (34 Ohm, 1 k or 10 k on discrete channels)
Sensor input voltage:	+/- 24 V
Sensor voltage protection:	+/- 50 V
Sensor input impedance:	2 M
Sensor voltage resolution:	12 bit
Restrict voltage:	-10 V to +10 V
Restrict voltage resolution:	8 bit
Sensor current measurement:	1 mA to 150 mA (10 nA to 150 mA on discrete channels)
Sensor current resolution:	12 bit
Sensor current input impedance:	50 Ohm (50 Ohm, 1 k, 10 k or 1 M on discrete channels)
Short detection threshold:	<4 Ohm
Link detection threshold:	<10 Ohm
Test modes:	Single, unconditional loop, pass loop, fail loop
Test clip positioning:	Automatically adjusts for clip orientation
Circuit compensation:	Automatically modifies test for IC/PCB connections
Test trace:	Test waveforms and voltages displayed
Test analysis:	Displays test parameters such as gain, hfe, feedback
IC test capability:	Op-amps, comparators, DACs, ADCs, switches and special function analogue ICs in-circuit.
Discrete test capability:	Transistors, FETs, thyristors, triacs in- or out-of-circuit
IC test libraries:	Analogue, discrete, package, user
Result comparison:	Results can be saved for good/bad board comparison
Package support:	DIL, SOIC, PLCC and variants with MultiProbe kits
SLIM test programming:	Structured programming language for library additions

Other specifications

Electrical input:	(typical) +12 V, 1 A (max) (typical) -5 V, 750 mA (typical) -12 V, 100 mA
Dimensions:	147 x 202 x 42 mm
Weight:	1 kg

Accessories

Standard	1 x SMD test tweezer set and adapters 1 x 24 way test clip and cable assembly 1 x Blue V-I probes and adapter 1 x Yellow V-I probes and adapter 2 x Pulse leads 2 x Ground leads 3 x Discrete leads

Options

Internal fitting	PCI interface
External fitting	MultiLink case (cost option) with USB. External case (cost option) which can hold up to 5 SYSTEM 8 modules (USB interface).

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64 channel Board Fault Locator Module

Digital IC test capability

Number of I/O channels:	64-256
Number of guard outputs:	4 or 8
Live comparison:	64 x 2, 128 x 2 with additional modules
Drive output voltage:	TTL/CMOS compatible
Drive output current:	Device dependent Typical H-L 80mA @ 0.6V Typical L-H 200mA @ 2V Max. 400mA
Drive slew rate:	>100V/µs
Receive input:	+/-10V
Input impedance:	10k
Termination:	Programmable for tri-state/open collector
Drive states:	Low, high, tri-state
Over voltage protection:	<0.5V, >5.5V
Test time:	Dependent on device
Circuit modes:	In-circuit. Out-of-circuit (with adapter)

Power supply for board under test

Automatic power supply:	1 x 5V @ 5A fixed (2 x 5V @ 5A fixed for 128 channels)
Over voltage protection:	7V
Short circuit current:	7A

Test modes

Single:	Single test
Loop:	Unconditional, loop while good, loop while bad
Auto:	Find tightest valid thresholds

Test thresholds

Resolution:	100mV
Low levels:	TTL 0.1V to 1.1V CMOS 0.1V to 1.5V
Switching levels:	TTL 1.0V to 2.3V CMOS 1.0V to 3.0V
High levels:	TTL 1.9V to 4.9V CMOS 1.9V to 4.9V
Swept low levels:	TTL 0.1V to 1.1V CMOS 0.1V to 1.5V
Swept switching levels:	TTL 1.2V CMOS 2.5V
Swept high levels:	TTL 1.9V to 4.9V CMOS 1.9V to 4.9V

Test types

Truth table (functional):	Library based functional test
Connections (MDA):	Short circuit detection Floating input detection Open circuit detection Linked pin detection
Voltage:	Resolution 10mV Range +/-10V Logic state detection
VI:	Number of channels 64 - 256 Sweep ranges -10V to +10V (programmable) Maximum test current 1mA Multi-plot with single waveform zoom
Thermal:	Indication of pin temperature

Test libraries

Library classes:	TTL 54/74 logic, CMOS, Memory, Interface, LSI, Microprocessor, PAL/EPLD, Linear, Package, Special and user defined
Package types:	DIL, SOIC, PLCC, QFP

Accessories

Standard	Automatic out-of-circuit adapter 1 x 64 way test cable 1 x 64 way split test cable 1 x V-I probe assembly 1 x BDO cable 1 x Short locator cable 1 x Ground clip 1 x PSU lead set

Options

Internal fitting	PCI interface
External fitting	MultiLink case (cost option) with USB. External case (cost option) which can hold up to 5 SYSTEM 8 modules (USB Interface).

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Variable Power Supply Module

Logic Supply

Low voltage output for digital circuits

Voltage	*2.5V to 6V programmable*
Resolution	*0.01V*
Over voltage	*3V to 7V programmable threshold*
Resolution	*0.1V*
Current	*5A*
Short circuit current	*7A*
Short circuit duration	*indefinite (auto recovery)*
Load regulation	*0.5% (20% to 80% load change)*
Ripple voltage	*80mV pk-pk max*

Variable Positive Supply

Positive voltage output for analogue circuits

Voltage	*0 to +24V programmable*
Resolution	*0.01V*
Current	*1.5A max*
Over current limit	*50mA to 1.5A programmable threshold*
Short circuit current	*1.5A*
Short circuit duration	*indefinite (auto recovery)*
Load regulation	*0.1% (20% to 80% load change)*
Ripple voltage	*50mV pk-pk max*

Variable Negative Supply

Negative voltage output for analogue circuits

Voltage	*0 to -24V programmable*
Resolution	*0.01V*
Current	*1.5A max*
Over current limit	*50mA to 1.5A programmable threshold*
Short circuit current	*1.5A*
Short circuit duration	*indefinite (auto recovery)*
Load regulation	*0.1% (20% to 80% load change)*
Ripple voltage	*50mV pk-pk max*

Physical data

Weight	*5kg*
Size	*295 x 247 x 65mm*
Power rating	*150W max*
Connectors and cables	*power cable, parallel interface cable, logic and ground cables, +V and -V cables*
PC requirements	*(Minimum) System capable of running Windows 95/98 with at least 32MB of RAM and 20MB of free hard disk space ECP/EPP capable parallel port or 16550 serial port*

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24 channel Analogue Test Station Module

V-I test capability

Number of test channels:	24 + 2 probes and references
Test voltage:	2 V to 50 V peak to peak
Voltage resolution:	8 to 12 bits
Test frequency:	37.5 Hz to 12 kHz
Test current:	1 µA to 150 mA
Source impedance:	100 Ohm to 1 M
Test waveforms:	Sine, square, triangle, ramp, pulse
Waveform modes:	V-I, V-T, I-T
Waveform display:	Multi-plot with single waveform zoom
Waveform comparison:	Automatic comparison algorithm for good and bad boards using live probes or saved data
V-I comparison tolerance:	50 mV to 500 mV with 50 mV resolution
Package support:	DIL, SOIC, PLCC, QFP and variants with MultiProbes
Pulse output:	Positive, negative or bipolar for thyristors/ triacs
Pulse amplitude:	Adjustable to +/-10 V
Calibration:	Automatic

Accessories

Standard	1 x 24 way test cable 2 x Ground leads 2 x Pulse leads 1 x Blue V-I probe and adapter 1 x Yellow V-I probe and adapter 1 x SMD test tweezer set

Options

Internal fitting	PCI interface
External fitting	MultiLink case (cost option) with USB. External case (cost option) which can hold up to 5 SYSTEM 8 modules (USB Interface).

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Training Board

Board Fault Locator Functions

Digital Test:	Test types
	CCT conditions
	Loop testing
	Logic trace
	Thresholds
	Digital V-I
	Invalid conditions
	Grounding issues
	Tri-state testing
	Open collector testing
	Guarding
	Comparison tolerance
	Live comparison
Graphical Test Generator:	Configuring the graphical test generator
	Setting the thresholds
	Inputting waveforms
	Defining responses
	Auto-learning responses
IC identifier	Equivalent Functions
	Use of thresholds
Short locator:	Operation
	Ranges
EPROM verifier:	Loading and saving EPROM files
	Effect of bus shorts
	Use of BDO signals

Analogue Test Station Functions

Analog V-I:	Effect of varying voltage and impedance
	Effect of varying waveform
	Difference between VI, VT and IT tests
	Dual probe mode
	Storing test result
	Comparison tolerance
	Clip testing
	MultiProbe testing
	Probe compensation
	Matrix VI
	Use of pulse output
	Testing Relays

AICT Functions

Analogue functional test:	Test types
	Device conditions
	Supply range
	Test analysis box
	Loop testing
	Analogue trace
	Generic type versus part number
Discrete Testing:	Use of special channels
	Measuring gain and voltage
	Effect of parallel components

Multiple Instrument Station Functions

Function generator:	Low frequency waveforms
	Higher frequency with duty cycle
	Changing wave shape, amplitude and offset
	Use of single pulse mode
	Effect of phase lock
	Effect of modulation
	Sweep mode
Frequency counter:	Measuring frequency/period
	Using event mode
	Setting target values
	Changing tolerances and display ranges
	Calculator
DSO	Use of controls
	Acquisition modes
	Aliasing
	ERS mode
	Automatic measurements
	Waveform storing and comparison
	Adjusting comparison tolerances
Multimeter	LM324 circuit
	Calculating op amp gain and DAC values
	Logging data
MIS Power Supply	Simple operation
MIS Universal I/O	Simple discrete circuit (diode, transistor)
	Analogue output voltage and current
	Measuring voltage and current
	Testing transistors and diodes

Electronic Principles Covered

Ohms Law
R/L/C Circuits
Diode Operation
Transistor Operation
MOSFET and FET Operation
Op Amp Operation
Comparator Operation

Other specifications

Electrical input:	Powered by MIS power supply or via external 6-way Molex through-hole connector.
	(typical) 5V, 600 mA (max)
	(typical) +12V 100 mA
	(typical) -12 V, 100 mA
Dimensions:	209 x 165 x 19 mm
Weight:	222g

Accessories

Standard	1 x power connector
	1 x SYSTEM 8 Premier test flow files and manual

Options

Cables:	3 x BNC cables for MIS
	10-way cable for MIS

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