3M

Dynatel™
Advanced Modular System
965AMS

Future-Proof Testing Platform

3M

The new Dynatel 965AMS system contains every feature of our previous 965 model plus a larger, brighter display that features 3M™ Vikuiti™ Display Enhancement technology, a user-friendly icon-based interface and rugged field-swappable modules.* These external modules can be shared between technicians and allow transmission testing of a variety of OSP technologies. The platform is available with an optional ADSL2+ modem module, and in the future, will also feature additional modules, such as: VDSL2, FTTx fiber test, VoIP and new technologies yet to come.

*Except for ISDN modem test

3M Dynatel Advanced Modular System 965AMS

3M™ DYNATEL™ ADVANCED MODULAR SYSTEM 965AMS

FEATURES AND BENEFITS

Communications	Capability to work with a PC or handheld computer supporting software upload and data downloads
Flexible architecture	Supports various data modem protocols such as ADSL2+
Graphical user interface	User-friendly, icon-based display of test results
Help function	An internal help and tutorial provides information as needed during operation
Backlight	High resolution/high contrast black and white LCD display
Vehicle power adapter	Plugs into standard vehicle accessory outlet
Windows/CE operating system	Provides open architecture software environment
Keyboard	Allows rapid access to twelve different "blue key" functions, reducing menu levels. Also has cursors, and supports alpha-numeric entry
Yellow and green LED lights	Signal battery state and communication status
Software	TDR and autotest knowledge based systems aids technicians during test interpretation
Bright big screen	Highly visible even in bright sunlight due to proprietary 3M™ Vikuiti™ brightness enhancement technology; 80% larger than 965DSP
Modular design	All you need is a new module to increase test capability (no need to replace test set)
Dynatel yellow	Rugged, dependable

THE COMPLETE TESTING PLATFORM FOR ALL OUTSIDE PLANT TELECOMMUNICATIONS

This microcomputer-controlled flexible test set family provides full-featured testing for the triple play—voice, video and data circuits. Because it's a Dynatel 965 series tester, the AMS model is easy to use, requiring minimal training for testing professionals. And because it emphasizes fault diagnosis and fault location, customer problems can be solved quickly.

AUTOTEST

The knowledge-based smart autotest function is the product of more than a hundred years of Dynatel team experience. It allows an automatic test of active and inactive lines with pass/fail limits. Autotest capabilities also include expert system analysis of test results with advice on how to repair or how to locate faults. 3M™ Dynatel™ Far End Device FED II and customizable selections of tests are supported by the autotest feature of the 965AMS platform.

EXTERNAL MODULES

The 3M™ Dynatel™ Advanced Modular System 965AMS modules are field swappable, testing the exact digital transmission modem needed for each job. The module supports special circuits technicians who work on a variety of circuit standards during a typical day. Because the modules are field swappable, the technicians can share them. So it's no longer necessary to buy a separate testing platform for each set of modules. The ADSL2+ module is currently available. The following is a list of future modem protocols: VDSL2, FTTx fiber test and VoIP.

RUGGED, WEATHER-RESISTANT DESIGN

The hand-held 965AMS product is housed in a lightweight, ergonomically-designed case for portability and ease of handling. The unit is weather-resistant and weighs only 5 lbs (2.2 kg). The unit operates on a desktop, on the ground, up in an aerial environment and in underground locations.

The Dynatel brand and the distinctive Dynatel yellow case are your assurance of rugged dependability.

ACCESSORIES

PRODUCT NAME	DESCRIPTION
Test leads	Five 5-ft (1.5 m) test leads with 2 mm gold-plated banana plugs one end and chrome-plated alligator clips on other end (black/red, blue/yellow, green) Lead styles include bed of nails, no nails, spike and Canadian test leads
European test leads	Five 5-ft (1.5 m) test leads with 2 mm gold-plated banana plugs one end and 4-mm gold-plated banana plugs on other end (black/red, blue/yellow, green)
RFL strap	1.5 ft (0.5 m) with alligator clips on ends
AC/DC adapter	100-250 VAC (50/60 Hz) input, 12 VDC (1 A) output Power cord with IEC socket, US cord included

ENVIRONMENTAL SPECIFICATIONS

Operating temperature	0° to 140°F (-18 to 60°C)
Storage temperature	-40° to 165°F (-40 to 75°C)
Moisture: rain, water and humidity proof	Meets or exceeds IP65, IP67

PHYSICAL SPECIFICATIONS

	SIZE (H X W X D) IN. (CM)	WEIGHT (INCLUDING BATTERIES)
965AMS (includes ADSL2+ module)	11.5 x 5.75 x 3.25 (29 x 14.5 x 8.3)	5 LB (2.2 KG)

3M™ DYNATEL™ ADVANCED MODULAR SYSTEM 965AMS

ELECTRICAL SPECIFICATIONS

FUNCTIONS	RANGE	RESOLUTION	ACCURACY
Voltage (DC)	0 to 99.9 V	0.1 V	1% ± 0.5 V
	100 to 300 V	1 V	3%
Voltage (AC)	0 to 99.9 V	0.1 V	1% ± 0.5 V
Meter resistance	100 to 250 V	1 V	3%
100 k or 1 m			
Current	0 to 59.9 mA	0.1 mA	1% ± 0.3 mA
	60 to 110 mA	0.1 mA	2%
Shunt resistance	430 Ω		
Resistance	0 to 9999 Ω	1 Ω	1% ± 5 Ω
With CO voltage	0 to 9999 Ω	1 Ω	1% ± 50 Ω
	10 k to 99.9 kΩ	0.1 kΩ	1%
	100 k to 999 kΩ	1 kΩ	3%
	1 M to 9.9 MΩ	10 kΩ	3%
	10 M to 99 MΩ	0.1 MΩ	5%
	100 M to 990 MΩ	1 MΩ	10%
Opens (no noise)	0 to 3,000 ft (0 to 1,000 m)	1 ft (1 m)	1% ± 3 ft (1 m)
	3,000 to 10,000 ft (1 km to 3 km)	1 ft (1 m)	3%
	10,000 to 50,000 ft (3 km to 15 km)	10 ft (10 m)	5%
	50,000 to 100,000 ft (15 km to 30 km)	100 ft (100 m)	10%
RFL			
Fault range	0 to 20 MΩ	—	—
Resistance to	0 to 99.99 Ω	RTS 0.01 Ω	0.1% of RTS ± 0.01 Ω[1]
Fault (no noise)	100 to 999.9 Ω	RTS 0.1 Ω	0.2% of RTS ± 0.01 Ω[1]
	1 k to 3 kΩ	RTS 1.0 Ω	1.0% of RTS ± 0.01 Ω[1]
Wet section test			
Loop resistance	0 to 7 kΩ	—	—
Resistive balance	0 to 3.5 kΩ	—	5%
Loop resistance	0 to 99.9 Ω	0.01 Ω	0.1% ± 0.01 Ω
	100 to 999.9 Ω	0.1 Ω	0.2% ± 0.01 Ω
	1000 to 7000 Ω	1 Ω	1.0% ± 0.01 Ω
Resistance difference	0 to 99.99 Ω	0.01 Ω	1% of loop resistance ± 0.01 Ω
Tone output			
ID tone	200 to 1000 Hz, fixed level	8 volt peak to peak	+1 Hz
Precision tone- 600 Ω Zout	200 to 9999 Hz, -20 to +1 dBm	1 Hz, 0.1 dB	1% Hz, 0.2 dB
	10 k to 19.99 kHz, -20 to +1 dBm	1 Hz, 0.1 dB	2% Hz, 1 dB
Ringers	0.0 to 4.0 ringer	0.1 ringer	
	0 to 2000 nF	10 nF	
Load coil count	0 to 5	1	±1 load coil
Ground resistance	5 to 500 Ω	1 Ω	1% ± 1 Ω
Ohms/distance calculator	0-9999 Ω	0.01	—
	0-99999 ft (0-30 km)	1 ft (0.1 m)	—

Note: [1]All resistance to fault measurement accuracies have an added factor of (2×10^{-8}) R_f ohms (R_f=fault resistance in ohms)

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ELECTRICAL SPECIFICATIONS

FUNCTIONS	RANGE	RESOLUTION	ACCURACY
TDR			
Ranges	100 ft, 200 ft, 500 ft, 1,000 ft, 2,000 ft, 5,000 ft, 10,000 ft, 20,000 ft, 30,000 ft (30 m, 60 m, 150 m, 300 m, 600 m, 1.5 km, 3km, 6 km, 10 km)	1 ft (1 m) 5 nS, 34 nS, 135 nS, 1660 nS, 600 nS	0.3% range Fixed values
Velocity input	0.50 to 0.99 (150 to 299 m/µs)	—	—
Modes	Single trace, dual trace, differential, memory, crosstalk, peak, memory diff.	—	—
Loss (and frequency) With 600 Ω Zin	-40 to +10 dBm, 200 to 3000 Hz, -40 to +10 dBm, 3000 to 9995 Hz, -40 to +10 dBm, 10 k to 19.9 kHz	0.1 dB, 1 Hz, 0.1 dB, 10 Hz 1 dB, 10 Hz	±0.5 dB, 2 Hz ±0.5 dB, 10 Hz ±1 dB, 20 Hz
Noise metallic 600 Ω Zin C and psophometric	0 to 50 dBrnc (-90 to −40 dBm0p)	1 dB	±2 dB
Noise to ground 600 Ω Zin	40 to 100 dBrnc (-50 to 10 dBm0p)	1 dB	±2 dB
Longitudinal balance	0 to 85 dB	1 dB	±2 dB
Dial mode	DTMF, pulse	Standard	Standard
Caller ID (U.S. and Canada only) Carrier level	Date, time, number, name -4 to −32 dBm	— 1 dBm	 ±2 dBm
Short range wideband specifications (without SA option)			
Wideband loss 100, 135 Ω Zin	-50 to +2 dBm, 20 kHz to 1.2 MHz	0.1 dB, 100 Hz	±2 dB, 1% Hz
Wideband tone output–100,135 Ω Zout	0 dBm, 20 k to 2.2 MHz	1 kHz	±+1 dB
SA wideband specifications (with SA option)			
Wideband loss 100, 135 Ω Zin	-85 to +5 dBm, 20 kHz to 2.2 MHz	0.1 dB, 100 Hz	±1 dB, 1% Hz
Wideband noise metallic 100, 135 Ω Zin E, F, G & G2 filters	E filter 10-90 dBm F filter 20-90 dBm G filter 30-90 dBm	1 dB 1 dB 1 dB	±2 dB ±2 dB ±2 dB
Wideband spectral analysis 100, 135 Ω Zin Dynamic range Wideband tone output–100,135 Ω Zout	10 kHz to 2.2 MHz −90 dBm to +10 dBm 0 dBm, 20 kHz to 2.2 MHz	0.5% of span 1 dB 1 kHz	1% ±1 dB ±0.1% frequency ±0.5 kHz
Impulse noise counting E, F, G & G2 filters			
Counting interval	1-60 minutes	1 minute	±5%
Threshold	Lower limits: 30 dBrnC & E 40 dBrnF 50 dBrnG 100 dBrn upper limit All 30 dB higher for N to Ground	1 dB	±1 dB (typical)
Count capacity	9999	1	—

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ELECTRICAL SPECIFICATIONS

FUNCTIONS	RANGE
Filters:	
C and Psphometric	300 Hz – 3400 Hz
E filter	1 kHz – 50 kHz
F filter	4.9 kHz – 245 kHz
G filter	20 kHz – 1.1 MHz – 3 dB points
G2 filter	20 kHz – 2.2 MHz

GENERAL SPECIFICATIONS

Drop test	Survives 3 ft (1 m) drop onto concrete, (survives 5 ft drop onto concrete with soft case) using ASTM D4169 assurance level I method 5276
Vibration	Meets Mil 810F method 514.5
Water, dust and chemical proof	Meets IP65 per IEC 529 (1989) for rain and dust Immersion test IP67 0.15 m deep
Emissions	Standards meet FCC part 15, class A: Digital Devices for the US, and EN55022 (radiated emissions)
Built to ISO9001/2000 certification for manufacturing facilities and TL 9000 compliant	
Built to ANSI/IPC A610-C manufacturing standards	
Language	English, Spanish, and French Canadian*
Units	Feet or meters, Fahrenheit or Celsius, dBrnC or dBm0p, m/uS or Vp
Battery	Rechargeable battery pack or alkaline, 9 hours typical use (50% on/off measures voltage)
Display	4.1" x 3.1" (104 x 79 mm), 320 x 240 pixel resolution, high visibility in bright sunlight due to 3M™ Vikuiti™ film technology
Stored results (All Results)	100 results total of all types maximum

Note: Routine lab calibration is not recommended or required
*Available late 2005

FEATURES

MODEL NAME	965AMS BASIC	965AMS TDR	965AMS TDR+SA	965AMS BASIC+ADSL2+	965AMS BASIC TDR+ADSL2+	965AMS SA+ADSL2+
FEATURES						
Basic VOM & POTS	•	•	•	•	•	•
TDR		•	•		•	•
Short range wideband loss/tone	•	•		•	•	
Wideband spectrum analysis + loss/tone			•			•
ADSL2+ modem				•	•	•

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FEATURES

965AMS BASIC	
Interconnectivity	**All modules include**
RS232	Communicates with a PC using a supplied cable
USB active synch client 1.1	Includes required USB cables
Battery charger port	
Test lead connectors	
Basic VOM	**All versions have these features**
Voltage	Detects and measures the presence of central office (exchange) or foreign DC or AC voltages, including ringer voltages
Current	Measures DC loop current with a 430-ohm shunt
Resistance	Measures conductor and insulation resistance up to 1GigaOhms
Soak test	High voltage extended period resistance measurement that will expose corrosion-induced faults
Opens	Locates opens at distances up to 100,000 ft. (30 km)
Resistive fault location	Displays distance to fault
Special resistance	Measures the loop resistance and the resistance difference between two conductors on a pair
Wet section test	Allows RFL measurement when both wires in a pair are faulted and there is no separate good pair available
Ringers	Measures and displays capacitance associated with one or more ringers and the equivalent count.
Ground resistance	Measures the resistance of the ground path
ID tone	High power interrupted signal for tracing and identification
Kick test	Rapid, fast combination of resistance, voltage and opens for quickly evaluating cable pairs
Voice band tests	**Noise, loss, tone, longitudinal balance, load coil counting and FED compatibility**
Load coil count	Indicates the presence of load coils in a loop circuit and distance to the first load coil
Loss	Measures voiceband loss
Noise	Measures noise metallic and noise to ground in dBrnC or dBm0p
Longitudinal balance	Provides active measurement of line balance
Level trace	Measures and displays the impedance of the un-terminated line as a function of frequency
Tone	Provides test tones for conductor identification and transmission testing. 10 default tones, user selectable. Voiceband to 20 kHz, ID tones to 1000 Hz
Autotest	Supports 3M™ Dynatel™ Far End Device FED II
Dialing	Offhook, dialing capability, monitoring capability
Microphone and speaker capability	Speaker has 1-watt power output for noisy environments
Caller ID functionality	Displays number, name, date, and time just like the customers callbox

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FEATURES

Wideband shortrange testing	**Wideband loss with limited range, wideband tone. This feature set is enabled in the basic and TDR units. Wideband loss measurements for short range or low frequency**
Test impedance	135 ohms only
Tone	20 kHz to 1.2 MHz at 0dBm

OPTIONAL FEATURES

TDR	**Full-featured TDR with user-selectable pulse widths, length, gain zoom, filter and Vp. The TDR feature is enabled in the TDR and SA models**
Single trace	Provides graphical representation of events on a pair. Including expert system analysis of trace results
Dual trace	Allows active comparison of two traces
Differential	Displays difference between two circuits
Crosstalk	Displays the crosstalk from one pair to another
Memory	Allows comparison of an active trace with a trace stored in memory
Memory diff	Difference between memory and live trace
Peak	Displays a history of maximum and minimum values with the live trace
WideBand tests	**Wideband loss, wideband noise, wideband tone, Spectrum Analyzer this feature set is enabled in the SA models**
WideBand	Continuous sine wave insertion loss and noise measurements
Test impedances	100 and 135
Wideband loss	Loss measurements to 2.2 MHz for pre-qualifying xDSL
Tone	20kHz to 2.2 MHz at 0dBm
E, F, G, G2 filter	Weighted noise and impulse noise counting

Available soon. To order, call 800/426 8688 and specify the appropriate 965AMS with optional ADSL2+ modem. The platform includes the NiMH battery pack, AC Adapter, AC power cord, test leads, alkaline battery holder, conductor strap and user's guide. You may order the ADSL2+ modem and 3M™ Dynatel™ Far End Device FED accessory for the 965AMS separately. For further information, please contact your local 3M representative or visit our website at http://www.3M.com/dynatel for more details.

ORDERING INFORMATION

PRODUCT NUMBER	STOCK NUMBER
965AMS-TDR/SA/ADSL2+/AC/DC/BON	80-6113-1614-4
965AMS-TDR/SA/ADSL2+/AC/DC/NN	80-6113-1660-7

KIT COMPONENTS

965AMS BASIC	DESCRIPTION
965AMS Basic	965AMS base unit, storage bag, blue, yellow, green, red and black test leads. Conductor strap, NiMH battery pack (packed in unit), alkaline battery holder, wire gauge, self test circuit board and chain bead, 110/220V AC adapter, certificate of calibration, vehicle power adapter, instruction manual, warranty card, quick reference card, USB cable, and ethernet cable (with ADSL2 options)

The full-service 3M repair facility can help you with any spare part needs. Contact the 3M repair center at 800/426 8688, or online at www.3MRepair.com.

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Note: Product specifications and descriptions in this document are subject to change.

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