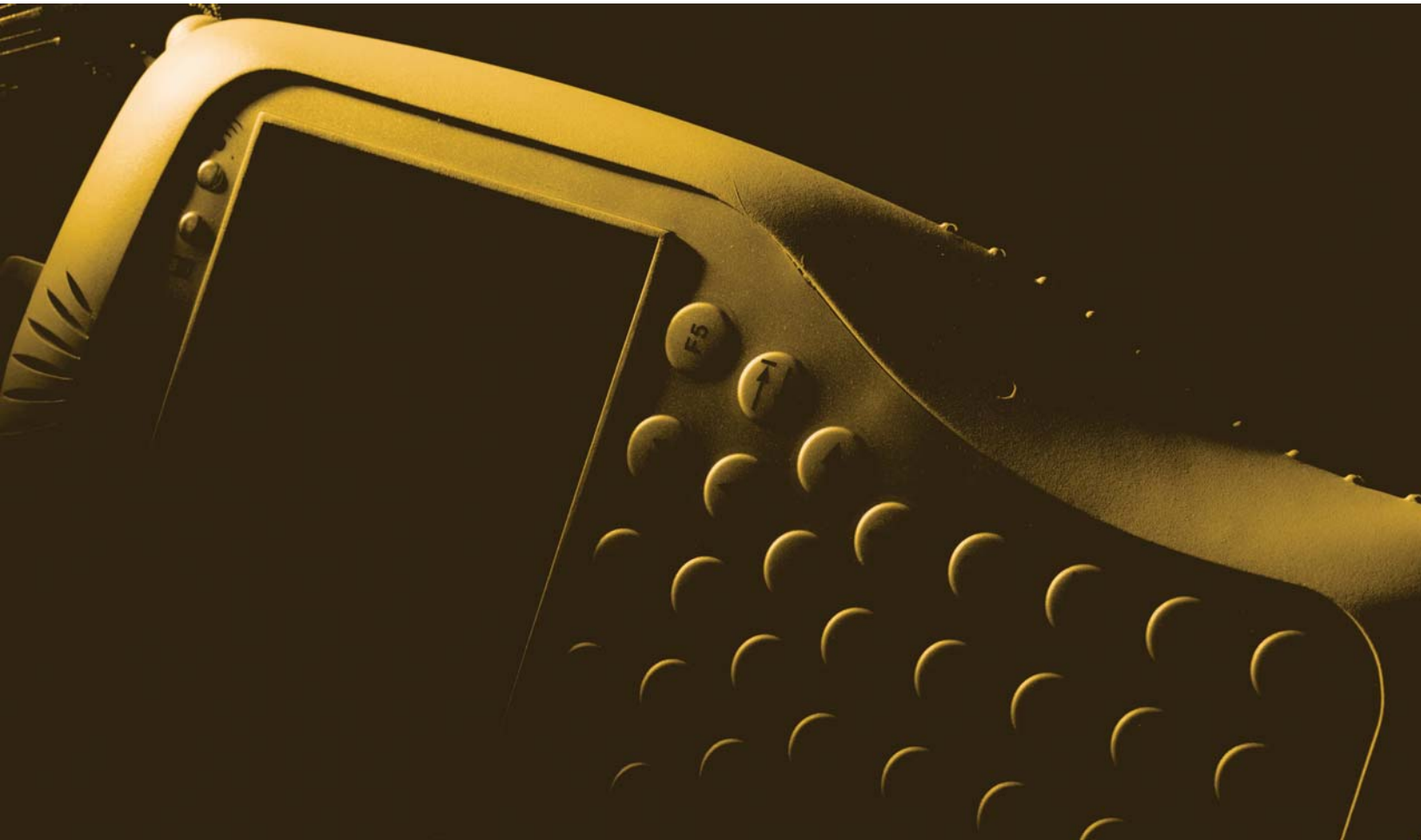


3M

Dynatel™



Advanced Modular System 965AMS



Future Proof Testing Platform

THE DYNATEL™ 965AMS. WHATEVER THE TECH, WE'VE GOT THE TESTER.

The new 3M™ Dynatel™ Advanced Modular System 965AMS contains everything our previous 965 model ever had plus a larger, icon-based, user-friendly display and new field-swappable modules. These external modules can be shared by technicians and will allow transmission testing of a variety of OSP technologies. The platform comes standard with the ADSL2+ service interface module (SIM) and ADSL2+ modem and will also feature additional modules, such as HDSL 2-4, VDSLs, FTTx Fiber Test, VoIP, DS1, DS3 and new technologies yet to come.

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, the AMS model is easy to use, requiring little or no training for testing professionals. And because it emphasizes fault diagnosis and fault location, customer problems can be solved quickly.



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
External battery charger/power supply	Allows use of the set while charging the battery
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 ¹
Red and green LED lights	Signal battery state and communication status
Software	TDR and autotest knowledge based systems aids technicians during test interpretation

AUTO-TEST

The knowledge-based smart auto-test is the product of over a hundred years of Dynatel team experience. It allows an automatic test of active and inactive lines with pass/fail limits. Auto-test capabilities also include expert system analysis of test results with advice on how to repair or how to locate faults. 3M FED II and customizable selections of tests will also be supported by the auto-test feature of the 965AMS platform.

EXTERNAL MODULES

The 965AMS external modules are field swappable, testing the particular digital transmission modem required for a particular situation. This type of module supports special circuits technicians who work on a variety of circuit standards during the course of a working 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. At launch, the ADSL2+ module will be available. The following is a list of future modem protocols: HDSL 2-4, VDSLs, FTTx Fiber Test, VoIP, DS1 and DS3.

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 4-6 lbs. The unit operates on a desktop, on the ground, up in an aerial environment and in underground locations.

The Dynatel™ brand and its distinctive Dynatel yellow cases 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)
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)
Humidity	0-95%, Non-condensing

PHYSICAL SPECIFICATIONS

	SIZE (H X W X D) IN. (CM)	WEIGHT (INCLUDING BATTERIES)
965AMS	—	5 LB (2.2 KG)

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) 20 to 4 KHz Meter resistance 100 K or 1 M	0 to 99.9 V	0.1 V	1% ± 0.5 V
	100 to 250 V	1 V	3%
Current Shunt resistance	0 to 59.9 mA	0.1 mA	1% ± 0.3 mA
	60 to 110 mA 430 ohms	0.1 mA	2%
Resistance With CO voltage	0 to 9999	1	1% ± 5
	0 to 9999	1	1% ± 50
	10 k to 99.9 k	0.1 k	1%
	100 k to 999 k	1 k	3%
	1 M to 9.9 M	0.1 M	3%
	10 M to 99 M	1 M	5%
	100 M to 990 M	10 M	10%
	3,000 to 10,000 ft (1 km to 3 km) 10,000 to 50,000 ft (3 km to 15 km) 50,000 to 100,000 ft (15 km to 30 km)	1 ft (1 m) 10 ft (10 m) 100 ft (100 m)	3% 5% 10%
RFL Fault range Resistance to Fault (no noise)	0 to 30 M		
	0 to 99.99	RTS 0.01	0.1% of RTS ± 0.01
	100 to 999.9	RTS 0.1	0.2% of RTS ± 0.01
	1 k to 7 k	RTS 1.0	1.0% of RTS ± 0.01
Wet section test Loop resistance Fault ratio Resistance to fault (No noise)	0 to 7 K		
	(Fault Res1) > twice (Fault Res2)		
	0 to 99	0.01	5%
	100 to 999	0.1	5%
Loop resistance 100 to 999.9 1000 to 7000	1 K to 3.5 K	1	5%
	0 to 99.9	0.01	0.1% ± 0.01
	0.1	0.2% ± 0.01	
Resistance difference 1000 to 7000	1	1.0% ± 0.01	
	0 to 99.99	0.01	1% of loop resistance ± 0.01
Tone output ID Tone Precision Tone- 600 Zout 10 k to 19.99 kHz, -20 to +1 dBm	200 to 1000 Hz, fixed level	8 volt peak to peak	+1 Hz
	200 to 9999 Hz, -20 to +1 dBm	1 Hz, 0.1 dB	1% Hz, 0.2 dB
	1 Hz, 0.1 dB	2% Hz, 1 dB	
Ringers	0.0 to 4.0	0.1	
	0 to 2000 nF	10 nF	
Load coil count	0 to 5	1	±1
Ground resistance	5 to 500	1	1% ± 1
Ohms/distance calculator	0-9999 ohms	0.01	—
	0-99999 ft (0-30 km)	1 ft (0.1 m)	—

ELECTRICAL SPECIFICATIONS

FUNCTIONS	RANGE	RESOLUTION	ACCURACY
TDR			*
Ranges	3 ft–300 ft, 20 ft–1,000 ft, 50 ft–3,000 ft, 150 ft.–10,000 ft, 450 ft–30,000 ft (1–100 m, 5–300 m, 15–1,000 m, 45–3,000 m, 140–10,000 m)	1 ft (1 m)	0.3% range
Velocity input	Pulse width 0.50 to 0.99 (150 to 299 m/μs)	1 nS step, 10 nS, 100 nS, 1000 nS	Fixed values
Modes	0.01 (1 m/μs)	—	—
	Single trace, dual trace, differential, memory, crosstalk, Peak, memory diff.	—	—
Loss (& frequency) With 600 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, 0.5 dB, 5 Hz 1 dB, 10 Hz	0.5 dB, 2 Hz 0.1 dB, 10 Hz? 1 dB, 20 Hz
Noise metallic 600 Zin C and psophometric	0 to 50 dBrc (-90 to -40 dBm0p)	1 dB	2 dB
Noise to ground 600 Zin	40 to 100 dBrc (-50 to 10 dBm0p)	1 dB	2 dB
Voiceband spectral analysis	180 Hz To 10 KHz at 600 ohms	power harmonics range and 10 KHz range, 1dB	1 Hz, 2 dB
Longitudinal balance	0 to 85 dB	1 dB	2 dB
Dial mode	DTMF, Pulse	Standard	Standard
Caller ID (U.S. & Canada only)	Date, time, number, name	—	—
Carrier level	-4 to -32 dBm	1 dBm	2 dBm
Short range wideband Specifications			
Wideband loss 100, 135 Zin	-50 to +2 dBm, 20 kHz to 1.2 MHz	.1 dB, 100 Hz	2 dB, 1% Hz
Wideband Tone output–100,135 Zout	0 dBm, 20 K to 2.2 MHz	1 kHz	+1 dB at 2.2 MHz
SA Wideband Specifications			
Wideband loss 100, 135 Zin	-85 to +5 dBm, 20 kHz to 2.2 MHz	.1 dB, 100 Hz	1 dB, 1%Hz
Wideband noise metallic 75, 100, 135 Zin E, F, G, & H 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 75, 100, 135 Zin	10 KHz to 2.2 MHz Dynamic Range –TBD dB to +10 dBm	1% of span	1%
Wideband Tone output–100,135 Zout 100, 110(Japan)	0 dBm, 20 K to 2.2 MHz	1 kHz	+1 dB at 2.2 MHz
Impulse noise counting E, F, G, & H filters			
Counting interval	1-60 minutes	1 minute	+5%
Low threshold	Lower limits: 30 dBrc, D&E 40 dBrcF 50 dBrcG 110 dBrc upper limit All 30 dB higher for N to Ground	1 dB	1 dB
Threshold spacing	2 to 10 dB	1 dB	1 dB
Count capacity	9999	1	—

ELECTRICAL SPECIFICATIONS

FUNCTIONS	RANGE	RESOLUTION	ACCURACY
Filters: IEEE 743 C, D, E, F, G and Psophometric for OUS	E filter F filter G filter	300 Hz – 3400 Hz 1 KHz to 50 KHz 4.9 KHz – 245 KHz 20 KHz – 1.1 MHz – 3 dB points	
Stored results (All Results)	100 results total of all types maximum		

GENERAL SPECIFICATIONS

Drop test	Survives 5 ft (1.5 m) drop onto concrete, using ASTM D4169 assurance level I method 5276
Vibration	Meets Mil 810F method 514.5
Water, dust and chemical proof	Meets IP64 per IEC 529(1989) for rain and dust Immersion test IP67 0.15 m deep
CE approval and UL/CSA approval on power adapter	
Emissions	Standards meet FCC part 15, class A: Digital Devices for the US, and EN55022 (radiated emissions)
CE approval	EN55024-2 (electrostatic discharge), EN55024-3 (radiated immunity) EN55024-4 (transient Immunity) and IEC1010 (product safety) for Europe
Built to ISO9001/2000 certification for manufacturing facilities	
Built to ANSI/IPC A610-C manufacturing standards	
Language	English, Spanish, and French Canadian
Units	Feet or meters, Fahrenheit or Celsius, dBmC or dBmOp, m/uS or Vf
Battery	Rechargeable battery pack or alkaline TBD hour's typical usage (measuring voltage 50%, 50% off. No backlight), will be different for alkaline batteries TBD hours typical (measuring TDR 3200nS, with backlight); typical usage defined as 30 minutes on, 30 minutes off Charging time 2 hours from low to full, typical
Display	4.1" x 3.1"(104 x 79 mm), 320 x 240 pixel resolution, high visibility in sunlight with backlight

Note: Routine lab calibration is not recommended or required

FEATURES

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

FEATURES

INTERCONNECTIVITY	All modules include
RS232	Communicates with a PC with an optional cable
USB active synch client 1.1	Requires optional cable
Battery charger port	
Test lead connectors	
BASIC VOM	All versions must have this module as a minimum
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	Allows the 965AMS to measure 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	Allows the 965AMS to measure 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	A test that 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 dBnC, or dBm0p
Longitudinal balance	Provides active measurement of line balance
Level trace	Measures and displays the AC 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's FED II
Dialing	Offhook, dialing capability, monitoring capability
Microphone and speaker capability	Speaker has 1-watt power output for noisy environments
Callerid functionality	Displays number, name, date, and time just like the customers callbox

OPTIONAL 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	20KHz to 1.2MHz at OdBm
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 OdBm
E, F, G filter	Weighted noise and impulse noise counting

ORDERING INFORMATION

PRODUCT NUMBER	DESCRIPTION
XXXX	XXXXXXXXXXXX
XXXX	XXXXXXXXXXXX

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