

3M™ Dynatel™ Triple Play Customer Service Test Set INS970

Product Description

Application

The 3M™ Dynatel™ Triple Play Customer Service Test Set INS970 has been designed for the Customer Service or Installation and Repair Technician. It performs acceptance (qualification) testing to alert the user whether promised service levels are delivered for POTS, IPTV and Internet services, both on new installations and repairs. Impairments on inside house wiring are easily located and identified enabling rapid installation, repair and restoration of service.

The INS970 test set helps prevent callbacks by performing a full suite of assurance tests to detect marginal copper pairs before they begin to affect service. Using Windows CE, comprehensive on-board work-force and records management applications are supported.

General Features

Using the test leads or RJ11 jack, test access is available from the CO to the customer premises. Dual RJ45 ethernet jacks permit troubleshooting subscriber equipment and network cabling troubles including inline testing with the customer's set-top-box.

CPE modem emulation enables testing at the NID for sectionalizing faults in the outside plant as well as pre-qualifying pairs before the customer's modem has been delivered.

The INS970 test set can perform an automated series of tests with an easily interpreted, color-coded, pass/fail indication. The full measurement details are also available and stored for upload to a PC.

The INS970 test set is ruggedly built for outdoor use, withstanding temperature extremes, rain and accidental drops. Its backlit color LCD provides improved visibility for easy interpretation of results. A vehicle adapter is included, allowing the battery pack to be recharged between jobs.

Support for auto testing with multi-tone test lines is also available.



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Acceptance/Qualification Testing

The tests below are run on new installations or after repairs to detect whether promised performance levels are delivered for POTS, IPTV and internet services.

Copper Pair	Foreign voltage (AC and DC) Ground resistance	
POTS	Battery voltage, loop current, dialing Noise, voice band loss	Caller ID Audio line monitor
DSL	Line rate, errors	
Internet	Gateway and server ping, web browser	
IPTV (optional)	Server ping, MDI score, join latency and rate	
Advanced Diagnostics Software (optional)	Loop analysis, attenuation analysis, spectrum analysis	
HPNA (optional)	Diagnostic link test, service link test	
Wiremapping	Cat. 5 wiremapping, coax wiremapping	



Reliability Assurance Testing

The following tests help prevent callbacks by detecting marginal copper pairs before they begin to affect service.

Copper Pair	Insulation resistance, Longitudinal balance (stress), common mode noise (power influence) Length	
DSL	Maximum rate, margin Attenuation, output power	

Troubleshooting Tests

These tests help the technician resolve problems when service levels are not met.

Copper Pair	Loop resistance, resistive length Capacitive balance Distance to open	Load coil count Ringer count
DSL	Bits per bin, SNR per bin	

Internet Tests

Protocols	LLC SNAP, VC MUX, PPPoE, PPPoA, Static IP, DHCP, PAP, CHAP
ICMP Ping	Average, maximum, minimum response time
Browser	Internet Explorer

IPTV Tests

VDSL2/ADSL2+

IPTV STB Emulation Test	Bandwidth, MDI:DF, MDI:MLR, PCR Jitter, RTP Jitter RTP SSRC, Join, Leave, Channel Latency (ZAP)
IPTV Passthrough Test	Bandwidth, MDI:DF, MDI:MLR, PCR Jitter, RTP Jitter RTP SSRC, Join, Leave, Channel Latency (ZAP), Packet Loss %, RTSP Status, Number of PID's

10/100/1000 Ethernet

IPTV STB Emulation Test	Bandwidth, MDI:DF, MDI:MLR, PCR Jitter, RTP Jitter RTP SSRC, Join, Leave, Channel Latency (ZAP)
IPTV Passthrough Test	Bandwidth, MDI:DF, MDI:MLR, PCR Jitter, RTP Jitter RTP SSRC, Join, Leave, Channel Latency (ZAP), Packet Loss %, RTSP Status, Number of PID's

HPNA

IPTV STB Emulation Test	Bandwidth, MDI:DF, MDI:MLR, PCR Jitter, RTP Jitter RTP SSRC, Join, Leave, Channel Latency (ZAP)
IPTV Passthrough Test	Bandwidth, MDI:DF, MDI:MLR, PCR Jitter, RTP Jitter RTP SSRC, Join, Leave, Channel Latency (ZAP), Packet Loss %, RTSP Status, Number of PID's

Ethernet (Gig E) Tests

Port D, E	Link down/up, crossover, speed, duplex
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3M™ Dynatel™ Triple Play Customer Service Test Set INS970 Specifications

General

Size	3"h x 4.7"w x 9.8"l (80mm x 120mm x 250mm)
Weight	3lb (1.36 kg)
Connectors	RJ11 and charger. F-type and RJ45 optional
Display	3.5 inch, (89mm) 320 x 240 color TFT
Keypad	Membrane, optional external USB keyboard and mouse
Speaker	Front facing, audible in high ambient noise environments
Battery Type	Rechargeable NiMH
Chargers	AC adapter 110/220V and vehicle adapter 12VDC
Operating Temperature	-10°C to +40°C
Humidity	0 to 80 % non-condensing
Drop	Unit functional after 3 drops from 1 meter in padded bag
Water Resistance	IP65
Regulatory	CSA (AC adapter only), FCC, CE
PC Interface	USB, 5 MBit/Sec transfer rate from INS970 to PC, client and host mode supported
Field Upgradeable	Software via USB memory stick
Result Storage	1000 auto test results, 1 GB storage available
Languages	English, French Canadian (North American configuration)
Security	Kensington lock socket, embedded serial number

Pots And Vacant Pair Tests

AC Voltage	0 to 250V
DC Voltage	0 to 250V
Resistance	0 to 30M Ω +/- 5%
Ground Resistance	0 to 50 Ω +/- 3 Ω
Capacitive Length	0 to 30KM, +/- 5%
Load Coils	Count 0,1,2,3,4 or >4 coils +/- 1 coil
Ringer Count	0 to 5, +/- 0.25 ringers
Longitudinal Balance	0 to 75dB, +/- 1dB
Noise to Ground	C-Message 40 to 100dBmC, +/-2, Zin=600 Ω
Noise Metallic	C-Message 0 to 60dBmC, +/-2dB, Zin=600 Ω
Loss	-50 to +10dBm, +/- 1dB, Zin=600 Ω , f=200 to 5000Hz
Frequency Counter	200 to 5000Hz, Zin=600 Ω , -50 to +10dBm
Trace Tone	577Hz Intermittent, 5Vp-p
Dialing	Touch tone or DTMF
Loop Current	0 to 110mA, +/- 2mA

3M™ Dynatel™ Triple Play Customer Service Test Set INS970 Specifications (cont.)

DSL Tests

Emulation	ATU-R, VTU-R, ATU-C, VTU-C
Protocols	ANSI T1.413 Issue 2 ADSL G.dmt G.992.1 Annex A, B ADSL G.lite G.992.2 Annex A ADSL2 G.992.3/4 Annex A, B, L, M ADSL2+ G.992.5 Annex A, B, L, M VDSL1 G.993.1 VDSL2 G.993.2 plan 997, 998
Performance	Actual Rate Up/Down (Fast and Interleaved) Maximum Rate, Margin, Attenuation, Capacity, Output Power FEC, CRC, HEC, SEF, ES
Graphs	Bin, SNR
Progress and Event Notification	Loss of Signal (LOS) Near End Loss of Frame (LOF) NCD and LCD

HPNA and Wiremapping (optional)

Diagnostics Link Test	Signal attenuation, spectrum analysis, data rate, margin, error counters, MAC Address, Chipset ID
Service Link Test	Service verification of IPTV, Ping, browse over HPNA link
Cat. 5 Wiremapping	Identify rooms/drops, miswiring, cable damage
Coax Wiremapping	Identify rooms/drops, cable damage Wiremapping option includes 6 nanofed remote identifiers A, B, C, D, E and F



3M™ Dynatel™ nanoFEDs identify drops in premise, to be used with wire-mapping option (sold separately)

Ordering Information – 3M™ Dynatel™ Triple Play Customer Service Test Set INS970

Product Number	Product Description	3M ID	UPC	Min. Order
UNIT				
INS970-BON	INS970 Customer Service Test Set with POTS/VDSL2/BON	CE100731948	0-00-51141-08306-3	1
OPTIONS				
IPTV-OPTION-INS970	IPTV option for INS970	CE100734603	0-00-51141-08450-3	1
INS970-ADV-OPTION	INS970 Advanced xDSL Diagnostics Software	CE100736632	0-00-51115-54366-1	1
INS970-HPNA-OPTION	INS970 HPNA Service Test and Wiremap Option, includes 6 nanoFEDs	CE100734611	0-00-51115-54367-8	1
STANDARD ACCESSORIES (SUPPLIED WITH INS970-BON CE100731948)				
INS970-CASE	Padded bag for INS970	CE100734850	0-00-51141-08471-8	1
INS970-NIMH	Battery pack NIMH for INS970	CE100734827	0-00-51141-08468-8	1
INS970-RJ11-BON	Cable, RJ11 to bed of nails red/black	CE100734769	0-00-51141-08462-6	1
1192	AC adapter/charger 110/220VAC with USA power cord for 965AMS/INS970	80611325525	0-00-51115-19113-8	1
1143	Green test lead bed of nails	80610864375	0-00-51138-57650-9	1
1188	Vehicle power adapter for 965AMS/950ADSL2+/INS970	80611316227	0-00-51115-19116-9	1
1300	965AMS/INS970 USB cable Type A male to male 3 foot	80611381593	0-00-51115-54323-4	1
INS970-MANUAL	INS970 instruction manual English	CE100734926	0-00-51141-08477-0	1
OPTIONAL ACCESSORIES				
1198	Backpack – Carry Case for 965AMS and INS970	80611335193	0-00-51115-53599-4	1

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

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