

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

Advanced Diagnostics Software Options – DELT, SELT and Spectral Analysis

The INS970 Test Set has the ability to run “advanced diagnostics” in different scenarios to help the technician troubleshoot problems with both active and inactive pairs.

The DELT (Dual Ended Line Tests) functionality leverages the power of the DSLAM to conduct a two-ended analysis of the line. This is extremely useful for several reasons:

- It saves valuable time, as it doesn't require the DSLAM to be disconnected in order to test the line, saving an extra truck roll.
- It analyzes the line through measurement, which is both more accurate and more realistic, as it tests the line in its final configuration.
- It effectively analyzes the line from both ends in one test, increasing the identification resolution.

When a DSLAM is not available on the pair to be tested, the SELT (Single Ended Line Test) feature set is used. This enables the INS970 test set to test a vacant pair to ensure it is capable of delivering the required service. One of the key features is the data rate estimation (and the associated impairment rate reduction quantification). This is important because the presence of impairment does not necessarily mean the pair is not capable of carrying a particular service. This, in turn, allows the technician to reduce the “false rejection rate” and helps reduce the workload on the cable repair crew.

Dual Ended Line Tests

The DELT tests are designed to help the technician characterize line quality impairments on pairs that are currently in service but that do not meet the service standards required. For these tests, a DSLAM is required on the other end of the pair as a link partner.



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

Bridged taps

Bridged taps can be serious concerns for high speed data delivery, as they rob the line of precious bandwidth. The 3M™ Dynatel™ Triple Play Customer Service Test Set INS970 can detect the presence of a bridged tap and quantify its impact in data rate loss:

3M Advanced Diagnostics Loop Analysis		3M Advanced Diagnostics Line Impairments	
Loop Estimate		AM and Other NB Disturbers	
Loop Length	3232m	300kHz Attenuation	48.6 dB
Bridged Tap 1	125m	Avg Downstream Atten	45.2 dB
Bridged Tap 2	113m	Data Rate Reductions	
		Bridged Taps	1500 kbps
		WideBand Noise	1000 kbps
		NarrowBand Noise	1750 kbps
		All Noise	4250 kbps

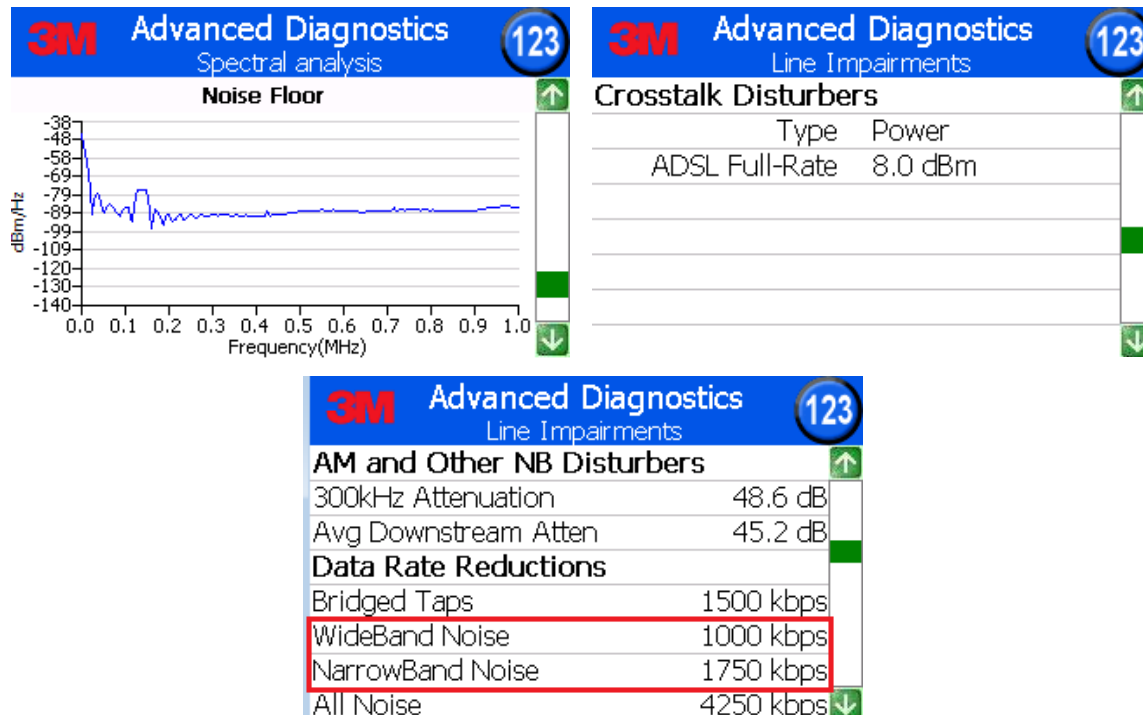
This is important, as it helps identify which pair troubles are worth fixing, and which ones are not.

Noise

Just like bridged taps, noise can really impair the ability of an otherwise good pair to deliver data at its best. The INS970 test set detects noise by scanning the entire active DSL spectrum (the spectrum used by the current connection) and then plotting it in a frequency based domain (Spectrum Analyzer). This is then automatically interpreted by the unit, to provide the technician with the most useful information:

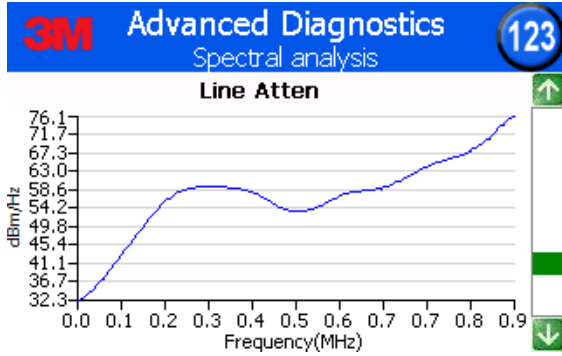
- What are the predominant disturbers?
- What effect do they cause on the data rate?

This interpretation is very useful, as it enables almost any technician (experienced and less experienced) to quickly understand where the noise is coming from and how bad the situation is:



Line Attenuation

Line attenuation is a graphical representation of the ability of a pair to conduct signals at different frequencies. In DSL technology, data is transmitted at different frequencies, throughout the available spectrum. Signals at different frequencies are affected differently by things like cable length, bridged taps and splices. The attenuation measurements are plotted by frequency, and the data is then automatically interpreted to determine things like bridged tap presence and data rate reductions.



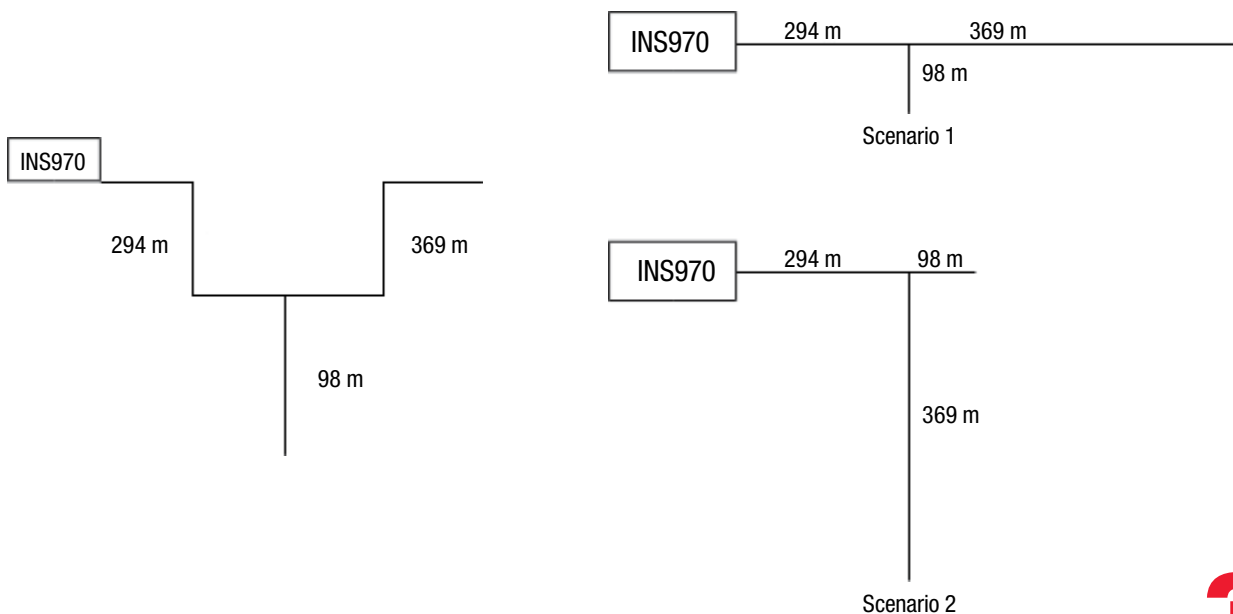
Single Ended Line Test

The SELT is designed to help the technician “pre-qualify” pairs that are currently not in service, in order to connect new customers or to replace existing customer lines.


Bridged Taps


Bridged taps can be serious concerns for high speed data delivery, as they rob the line of precious bandwidth. The 3M™ Dynatel™ Triple Play Customer Service Test Set INS970 can detect the presence of a bridged tap, its length and distance from the unit, and quantify its impact in data rate loss.

Since the line is not terminated (vacant), two scenarios are presented to the technician, as it is not logically possible to determine which leg is the bridged tap and which leg belongs to the main path; example:



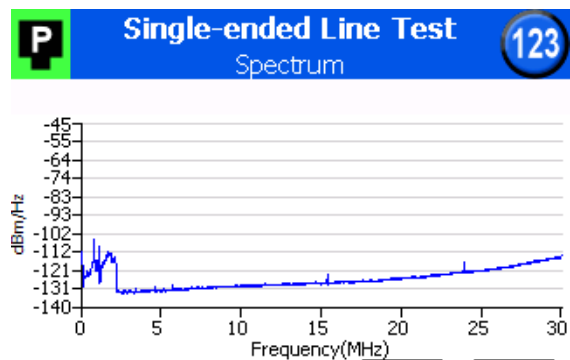
Each scenario is then analyzed and an estimate of the bridged taps rate reduction impact and the achievable data rate, based on the service selected (ADSL or VDSL2), is provided:

 Single-ended Line Test Scenario1 Detail		123
Loop Length	663m	
Distance to bridge tap	294m	
BridgedTap Length	98m	
Data Rate estimate		
Upstream	27216 kbps	
Bridged Taps Reduction	5096 kbps	
Downstream	66204 kbps	
Bridged Taps Reduction	5216 kbps	

 Single-ended Line Test Scenario2 Detail		123
Loop Length	392m	
Distance to bridge tap	294m	
BridgedTap Length	369m	
Data Rate estimate		
Upstream	46676 kbps	
Bridged Taps Reduction	4116 kbps	
Downstream	76280 kbps	
Bridged Taps Reduction	7376 kbps	

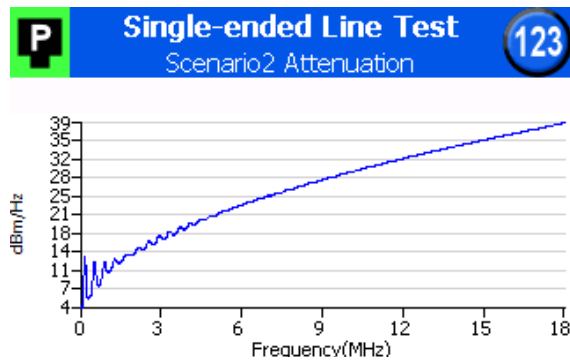
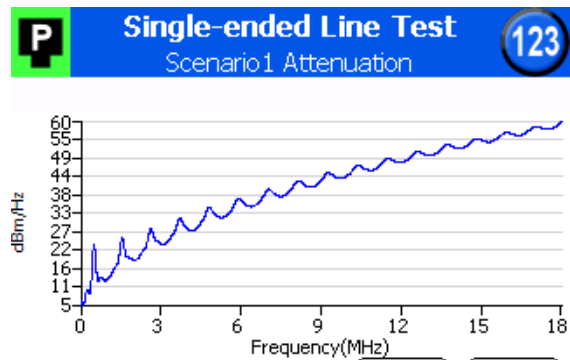
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Line Attenuation

Line attenuation is a graphical representation of the ability of a pair to conduct signals at different frequencies. Just like for the rate estimation, line attenuation plots are provided on a per-scenario basis.



3M™ Dynatel™ Accessories

DELT Diagnostics

Loop Analysis	Bridge tap and noise impairment on the line, noise/crosstalk disturbers
Attenuation Analysis	Line attenuation graph (30 MHz)
Spectrum Analysis	SELT and DELT (30 MHz) spectrum analyzer graphs

Ordering Information

Product Number	Product Description	3M ID	UPC	Min. Order
INS970-ADV-OPTION	Advanced xDSL Diagnostics Software Option	CE100736632	0-00-51115-54366-1	1

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

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Communication Markets Division

6801 River Place Blvd.
Austin, TX 78726-9000
800/426 8688
Fax 800/626 0329
www.3M.com/Telecom

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