

Agilent N2640A WireScope™ Pro

Field Testing of Cabling with AC Coupled PoE Midspan Devices

Product Note

WireScope Pro N2640A: Field Testing of Cabling with AC Coupled PoE Midspan Devices

Referred to as Powering over Ethernet (PoE), the IEEE Standard 802.3af™-2003 Amendment: "Data Terminal Equipment (DTE) Power via Media Dependent Interface (MDI)" extends the capability of Ethernet over twistedpair by allowing power to be delivered along with data over 10BASE-T, 100BASE-T, and 1000BASE-T twistedpair link segments e.g., ISO/IEC and TIA/EIA cabling.

Power can be implemented by inserting power sourcing equipment on pin-pair assignments (4, 5) and (7, 8) of the twisted-pair link segment between the DTE and the device to be powered (Figure 2). These powering devices are called "midspan" power sourcing equipment (midspan PSE). The midspan PSE allows for the power to be supplied external to the Ethernet equipment. This implementation will offer both data and power on the twisted-pair link segment without burdening each port of the Ethernet equipment with the need to provide power, and will allow for the support of legacy Ethernet equipment that lacks the powering capability. Patch panels with integral midspan PSE's facilitate plug-and-play data and power connectivity for powered devices.







Figure 2 Powering the Inserted Midspan



Why is Testing Necessary?

Coupled Testing

Once the AC Coupled Testing is

AC coupled. There is no need to

repeatedly enable and disable the

setting even when you are testing a

Autotest, then choose Edit Settings.

To open the *Measurements Setup*

Measurements, and click on Edit.

menu, set the cursor to

mix of PoE and non-PoE cablings links.

whether the cabling link under test is

Midspan is typically implemented with AC coupled power pairs as illustrated in figure 3. For the performance of the link it is important to ensure that the RF parameters of the cabling including the passive midspan PoE connections meet the requirements of the standards. AC coupling the power delivery pairs in the cabling tester enables field testing of the frequency dependent transmission performance parameters on all 4 pairs of the cabling with the midspan PSE inserted in the cabling link.





Configuring the WireScope Pro for AC Main Menu Cable Autotest Setup Autotest Settings Profile : None Settings Summary F Class F : Link 1 enabled in the measurement setup, the None Autotest Profile Agilent : Cat 7 Tera Channe ķ WireScope Pro automatically identifies F Network Limits : Off Class F : Link Limit Site : Unspecified Alien Unspecified 實 Unspecified Tools Site Crosstalk Unspecified Cable Pairing : T568B 昌 To enable AC Coupled Testing, click on Jer. Select Settings Profile Database 😋 Max Frequency : 600 Mhz Save : Full Data Set 4 Storage : USB Flash-drive Calibration Edit Settings 📴 Operators D 4 Start Test System Edit 0 12:50 PM 2 45% 🖋 50% 🔇 12:50 PM 2 45% 🖋 50% 3 12:52 PM 2 45% 🚿 50% Main Main Main Back Help Back Help d Back Help Menu Menu Menu



Figure 4 Measurement Setup

Figure 5 Configuring the WireScope Pro for AC Coupled Testing

Connecting the WireScope Pro Test Kit to the Cabling under Test

Now, connect the WireScope[™] Pro and DualRemote Pro to the cabling under test as shown in figure 4, and start an Autotest.

In the *Measurements Setup* Menu, click *Next* to come to the second page; then activate *AC COUPLED*.

Click *Next* to come to the final page, and close the dialog with *OK*.

Measurements Setup	Measurements Setup	Measurements Setup
The following measurements are required to certify the tested cabling to the limits you have selected. Disabled measurements from this list will be performed and recorded but will not be used when determining certification status. Press Next to continue. NEXT Attenuation Return Loss ELFEXT PS NEXT PS ELFEXT PS NEXT PS ELFEXT Delay Delay Skew ACR PS ACR Resistance	The following measurements are optional and are not required to certify the cabling to the limits you have selected. Check any optional measurements that you wish to add to the autotest. Press Next to continue. AC COUPLED	Check any of the test result analysis functions that you wish to enable. Margin Checking marks tests which are very close to the test limits as Pass* or Fail*. Attenuation Warnings triggers when the measured attenuation is excessive relative to the length of the cable. Margin Checking Attenuation Warnings
Cancel	Previous Cancel	Previous Cancel OK

Figure 6 Enabling AC Coupled Testing

Interpreting Measurement Results

The following screen shots are possible results of AC Coupled testing with the WireScope Pro. All three examples represent good (PASS) results.



Figure 7 PoE Patch Panel

Here, a PoE Patch Panel is part of the channel or permanent link under test:

The WireScope Pro's result screen displays a wiremap illustration together with a capacitor symbol and the words **AC COUPLED**.





Here, a PoE Midspan Device is part of the channel or permanent link under test:

The WireScope Pro's result screen displays a wiremap illustration together with the words **PoE** and **AC COUPLED**.



Figure 9 No PoE Device

Here, there is no PoE installed:

The WireScope Pro displays a regular wiremap illustration.

Limitations

The following limitations of the AC Coupled Testing feature apply to software version 2.5.13:

- 1. Wiremap Errors of AC coupled cabling links are not detected in this software version. They can be inferred from the measurements manually.
- 2. When performing an Autotest on non-PoE cabling, but with AC coupled testing enabled, wiremap errors may be misinterpreted in some cases as a patch panel setup (see figure 7) or a midspan device (see figure 8).
- 3. DC Resistance measurement is not performed when AC coupled testing is enabled.
- 4. Shield testing is not done when AC coupled testing is enabled.

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5989-7303EN

