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 twisted-pair by allowing power to be delivered along with data over 10BASE-T, 100BASE-T, and 1000BASE-T twisted-pair 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.

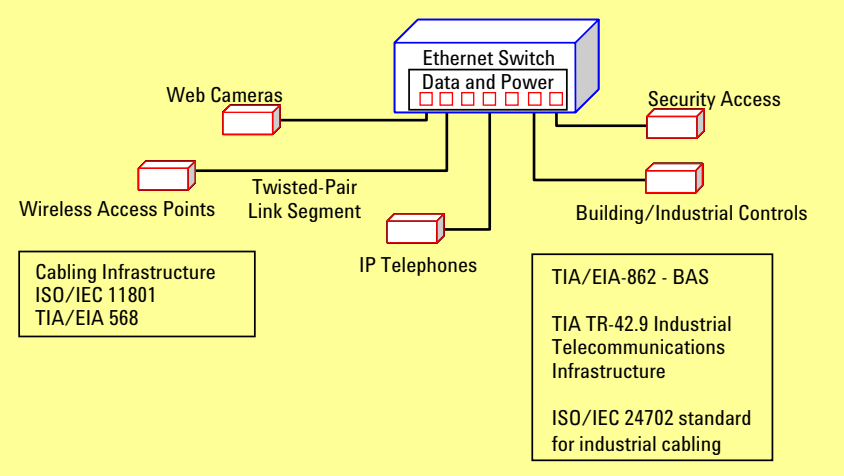

Figure 1 Powering over Ethernet Applications

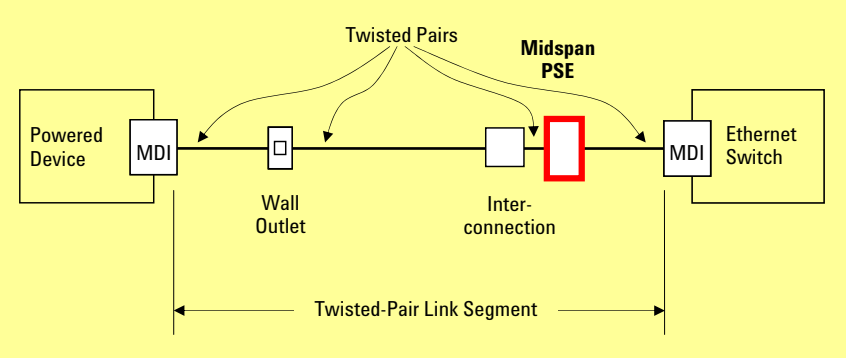

Figure 2 Powering the Inserted Midspan

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Why is Testing Necessary?

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.

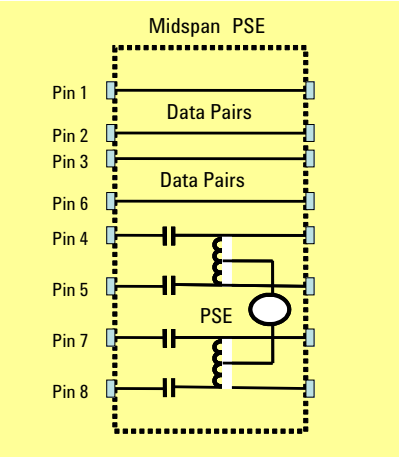

Figure 3 Midspan Implementation

Configuring the WireScope Pro for AC Coupled Testing

Once the AC Coupled Testing is enabled in the measurement setup, the WireScope Pro automatically identifies whether the cabling link under test is AC coupled. There is no need to repeatedly enable and disable the setting even when you are testing a mix of PoE and non-PoE cablings links.

To enable AC Coupled Testing, click on ***Autotest***, then choose ***Edit Settings***. To open the ***Measurements Setup*** menu, set the cursor to ***Measurements***, and click on ***Edit***.

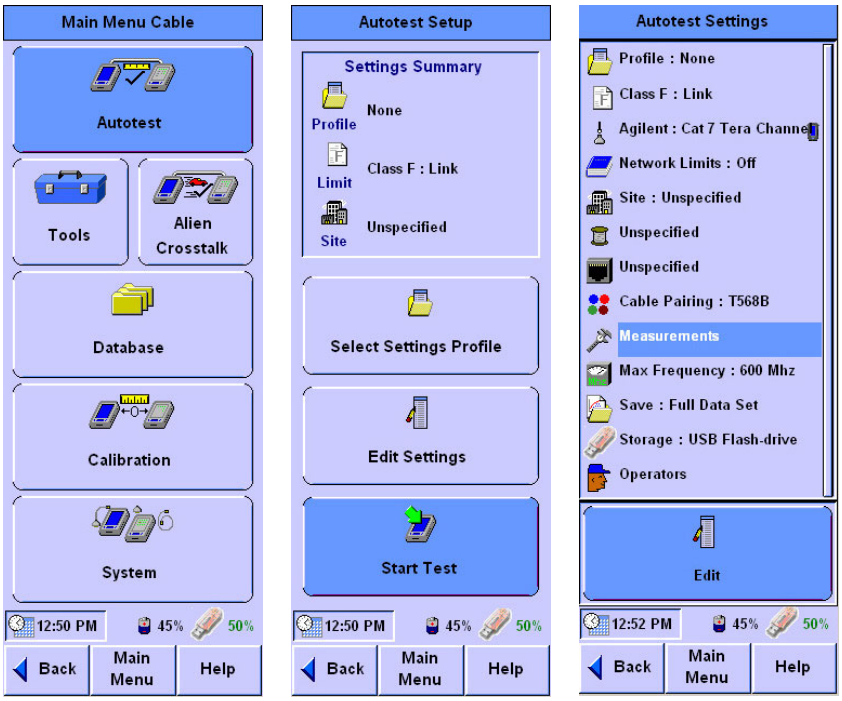

Figure 5 Configuring the WireScope Pro for AC Coupled Testing

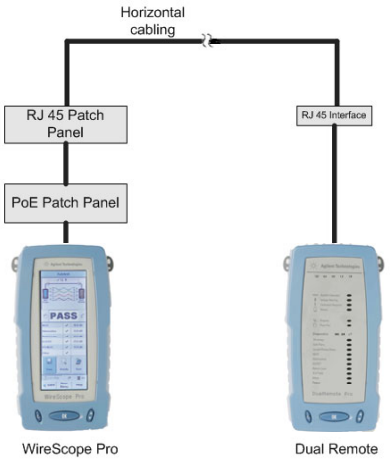

Figure 4 Measurement Setup

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***.

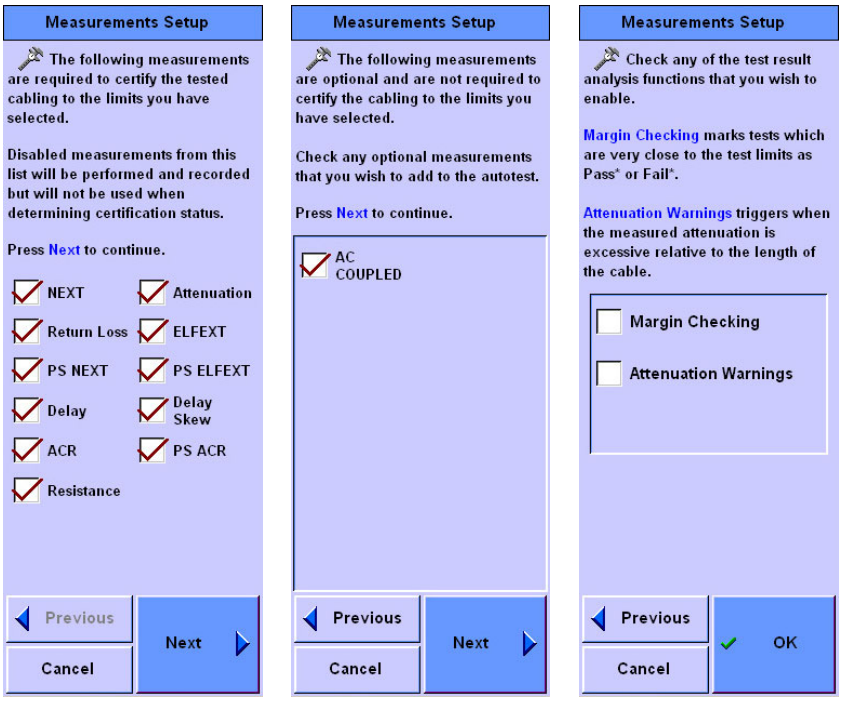

Figure 6 Enabling AC Coupled Testing

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.

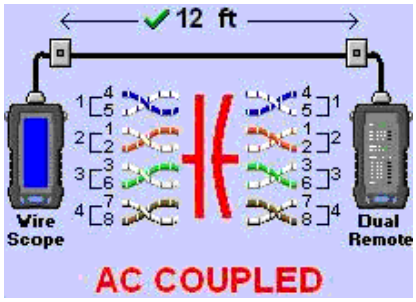

Figure 7 PoE Patch Panel

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***.

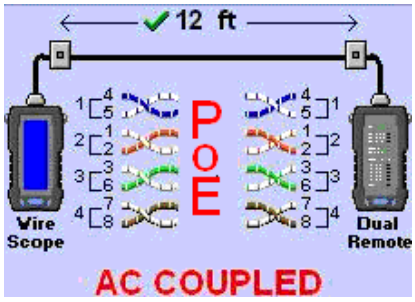

Figure 8 PoE Midspan Device

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***.

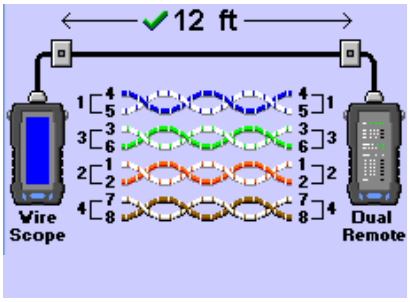

Figure 9 No PoE Device

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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