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Anritsu

MD1230A

Data Quality Analyzer to test DWDM GbE Networks

Application Note



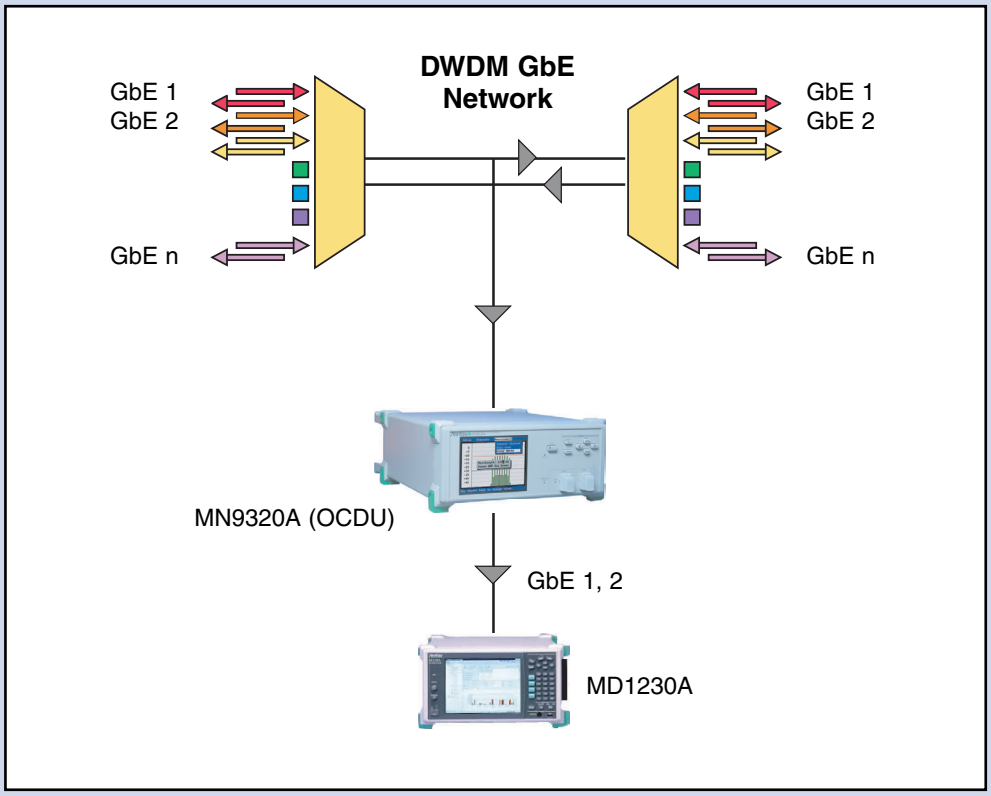
Using the Anritsu MN9320A Optical Channel Drop Unit and Anritsu MD1230A

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MD1230A Data Quality Analyzer

OVERVIEW

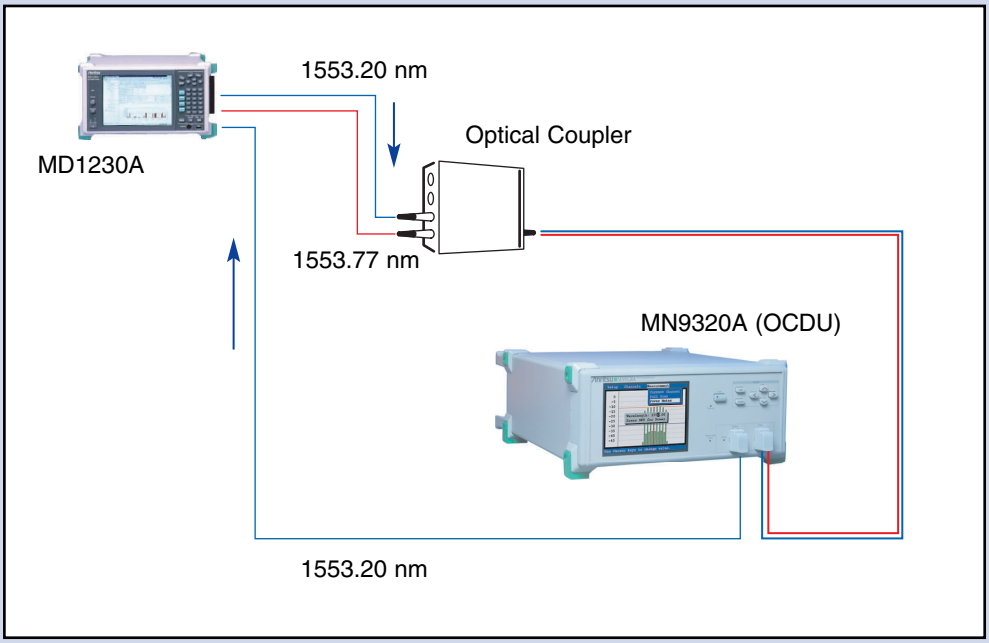
Gigabit Ethernet (GbE) is seeing explosive growth in metro network applications. The capacity of these networks can be easily expanded by adding additional wavelengths and GbE channels to the fibers. But these Dense Wavelength Multiplexing Division (DWDM) systems need additional test equipment to allow monitoring and testing (see Figure 1).



(Figure 1) Testing a DWDM GbE Network using a MN9320A and MD1230A

This application note describes how to use the Anritsu MN9320A Optical Channel Drop unit (OCDU) to select individual channels in a simulated DWDM GbE network and send the channel to an MD1230A for testing.

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(Figure 2) Simulated GbE Network with Two Channels with Testing Capabilities Provided by the MD1230A and MN9320A

Figure 2 shows the simulation. An MD1230A is used to generate traffic on 2 GbE different channels (1553.20 nm and 1553.77 nm). The channels are combined using a coupler and sent to the OCDU. The OCDU extracts one of these channels (1553.77 nm) and outputs it to the MD1230A for testing.

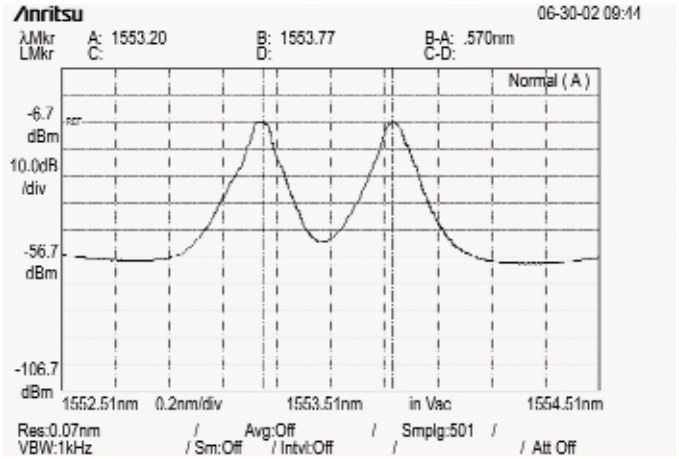
MD1230A DATA QUALITY ANALYZER

The MD1230A accepts up to five physical interface modules and houses up to five GbE modules permitting up to 10 GbE ports per MD1230A.

The MU12012A GbE interface module accepts two independent GbE transceivers. The Anritsu G0108A GBIC transceiver uses single-mode fiber at 1550 nm. Two G0108A transceivers were selected with differing wavelengths and installed into the MU12012A. Figure 3 shows a side view of the MD1230A with the MU12012 GbE module.



(Figure 3) Side View of MD1230A with MU12012 GbE Module



(Figure 4) Spectral Characteristics of Combined GbE Signals

SPECTRAL CHARACTERISTICS

The spectral characteristics can be seen in Figure 4 with a screen capture from the Anritsu MS9710B Optical Spectrum Analyzer. One GBIC module has a transmit wavelength of 1553.20 nm and the other module at 1553.77 nm. But depending on the GBIC modules used, these values could differ. For the purpose of this application note however, the wavelengths are 1553.20 nm and 1553.77 nm. An optical coupler is used to combine both wavelengths and send them out over the same fiber.

MN9320A OPTICAL CHANNEL DROP UNIT (OCDU)

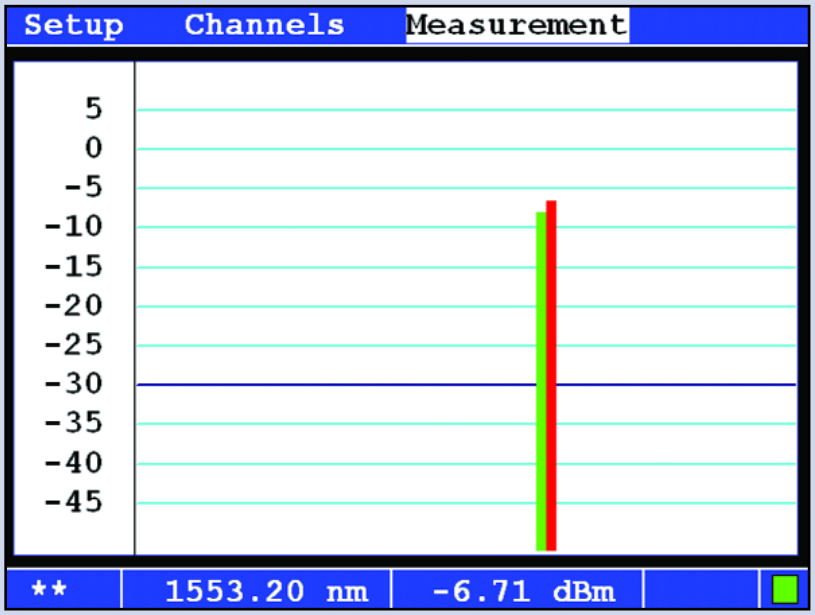
The MN9320A Optical Channel Drop Unit is a precision tunable filter and power meter assembly that allows characterizing all optical signals between 1528 nm and 1565 nm (C band). Data rates up to 10 Gbps are possible. This filter, also, has steep skirts to allow selecting GbE channels only 0.4 nm (50 GHz) apart. Wavelength accuracy is 10 pm (typical) allowing for accurate characterization of optical channels. This makes it ideal for passing the modulated signal from GbE modules. In our demonstration, the spacing between the two channels is 0.57 nm.

SETTING UP THE OCDU

Connect the output from the first optical coupler to the input port of the OCDU. Then connect the output port of the OCDU to the input line of the second optical coupler.

Turn on the OCDU unit. In about a minute or so, a ready message should appear. Press the *right arrow key* to move the cursor to the "MEASUREMENT" drop down menu and press *SET*.

Then select the "DETECT GRID" function. This command is used when the channel wavelengths of the input are not known.



(Figure 5) Channels are Characterized

This causes the OCDU to perform a high-resolution sweep across the entire C band spectrum. Two signals are found. Afterwards, the unit prompts:

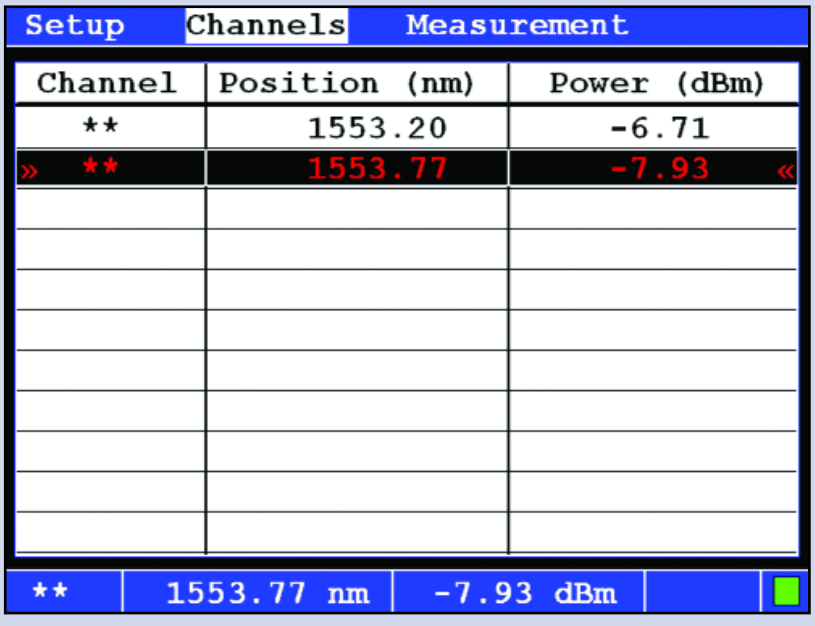
FOUND 2 channels

Replace Channel Table?

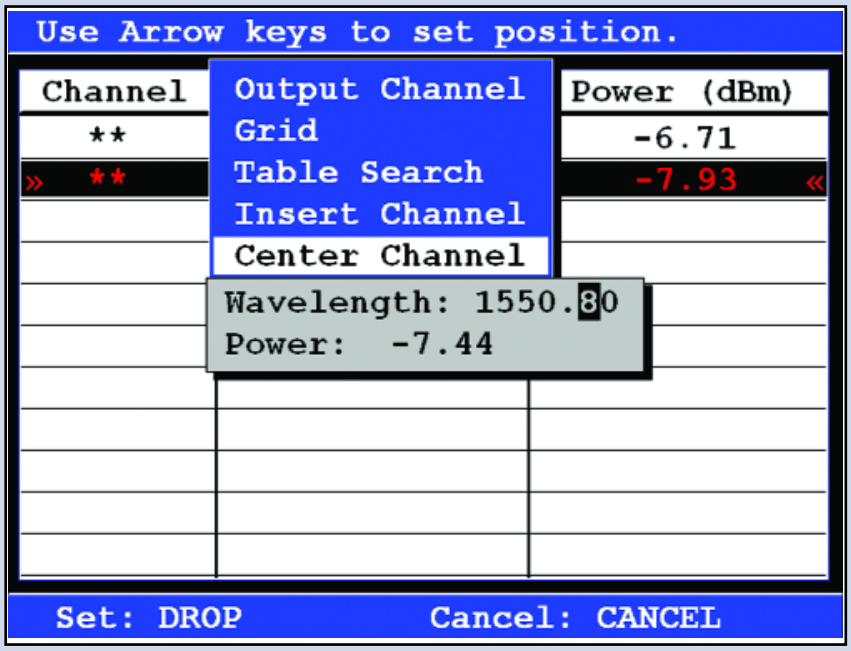
Click *SET* to create a new channel table with all of its channel positions assigned number "**".

Two wavelengths, one at 1553.20 nm and another at 1553.77 nm appear. They show up as two channel bars on the screen (see Figure 5).

To select the 1553.77 nm wavelength for output, move the cursor to the "CHANNEL" drop-down menu. Then move the cursor down to the 1553.77 nm channel selection and (see Figure 6) press *SET*. This channel will be sent to the OCDU output port.



(Figure 6) Selecting a Wavelength for Output



(Figure 7) Center Channel Function

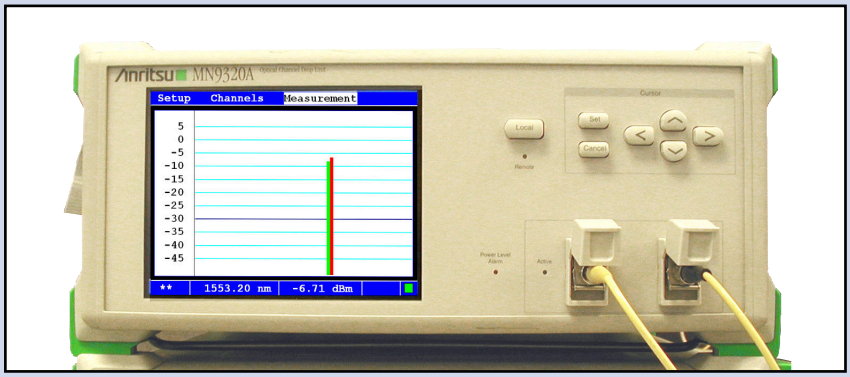
Note: Because the lasers in the GBIC modules can drift, the OCDU has a "CENTER CHANNEL" function. This option may be used to locate the actual peak of a wavelength and center it (see Figure 7). However since the "DETECT GRID" function was used, the channels are centered automatically.

TESTING WITH THE OCDU AND MD1230A

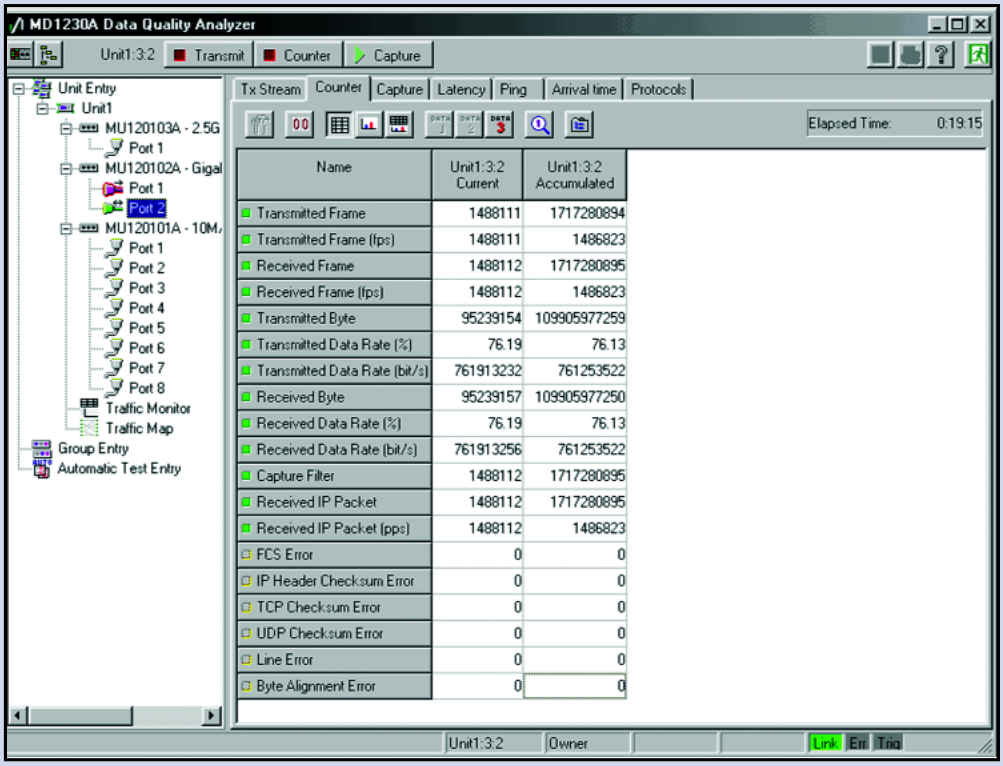
Once the signals are characterized (see Figure 8), each one may be selected for passing on to a protocol analyzer such as the MD1230A for monitoring and/or testing (see Figure 9).

TWO POWERFUL INSTRUMENTS — ONE UNIQUE SOLUTION

As DWDM GbE networks make further inroads into the LAN and Metro space, it becomes more critical to test and maintain these networks. The Anritsu's MN9320A and MD1230A can provide these test solutions. Please call 1-800-ANRITSU or visit our web site at www.us.anritsu.com for more information.



(Figure 8) Two Wavelengths Characterized by the OCDU



(Figure 9) MD1230A Display with an Error-Free Traffic Link Set Up through the OCDU

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