Do you need to see with greater details?

AP2040 series/AP2050 series
Optical Spectrum Analyzer

5 MHz Resolution
+/- 3 pm WL accuracy
2 channels
1 per polarization axis
Ultra high resolutions:
140 MHz/1.12 pm;
20 MHz/0.16 pm;
5 MHz/0.04 pm...

1- Two internal channels (one OSA per polarization axis)
Optionaly two different aditional PM inputs are available. The user can select between the input independant of polarization or the two PM inputs.

Input independant of polarization:
After splitting the input signal into two orthogonal polarization axis, these polarization axes are analysed simultaneously by two internal independant channels. By using this method, APEX OSA can display the two polarization channels separetely or recombine them and display a polarization independent measurement.

Two PM inputs:
The two input signals can be analysed simultaneously by two internal independant channels. By using this method, APEX OSA can display the two signals separately.
2- Tunable Laser Source & Tracking generator
- The built-in Tunable Laser Source local oscillator can also be used as an independent TLS. In option a TLS optical output and a control software can be integrated into the equipment.
- The tracking generator option allows the user to synchronise the wavelength TLS output with the OSA measurement. With this combination, active and passive components transmission measurements (insertion loss/gain) are possible with a dynamic range of 63 dB and a resolution of 1 MHz.

3- Wavelength accuracy
The two different internal wavelength calibrators (absolute and relative) furnish to the equipment an accurate wavelength value of the TLS position. This technique provides a very high wavelength accuracy specification of +/- 3 pm.

The absolute wavelength calibrator is a gas cell.
The relative one is a Fabry Perot with a fixed free spectral range.

4- Close-in dynamic range
The resolution of APEX Technologies OSA aren’t related to optical filters but electrical ones. These electrical filters are close to rectangular shape. Thanks to these special electrical filter forms, the close-in dynamic range is very high:
- @ +/- 0.4 pm from the peak, the dynamic > 60 dB
- @ +/- 6 pm from the peak, the dynamic > 80 dB

... and typicals resolutions from 250 GHz/2 nm to 140 MHz/1.12 pm

APEX Technologies OSA rectangular shape filters allow a nearly perfect integration of the signal over the selected resolution, while a grating based OSA filter integrates inside a wide base triangular shape. This sharp integration allows our OSA to perform a much more realistic level measurement.

3

NTUITIVE SOFTWARE
APEX Technologies OSA software is appreciated by unexperienced as well as expert users. It combines a full panel of functions with an impressive usability.

STORAGE
The equipment is equipped with a 32 Gb hard drive and 3 USB inputs. bmp, txt and setup file formats are available.

EQUIPMENT CONTROL
The equipment can be controlled by 3 different ways:
- The front panel
- The sensitive screen
- A mouse and a keyboard

REMOTE CONTROL
The remote control allows the operator to set measurement parameters and to execute a measurement. The user can take the control and perform data transfer with a computer through GPIB or ethernet. It is also possible to take the control of the equipment through internet from everywhere in the world.
APEX TECHNOLOGIES TEAM DEVELOPED AN INTUITIVE SOFTWARE. THE GOAL OF THIS SOFTWARE IS TO JOIN SIMPLICITY AND POSSIBILITIES. LINES, MARKERS, AUTO SCALE MODE, 6 DIFFERENT TRACES, ZOOM, SCROLL, SETUP AND ANALYSIS FUNCTION ARE AVAILABLE.

1- Instrument selection
This button allows the user to select which function you want to display (Optical Spectrum Analyzer, Tunable Laser Source, Power meter, OS Settings).

2- Setup Function
This menu groups all the measurement configuration parameters for easy review. In just one window the OSA measurement parameters can be configured, loaded or saved.

3- Scale
The scale can be modified very quickly. Just press the button corresponding to the value or the unit you want to change and modify it.

The scale values can be modified with this following button type:

The scale units can be modified with this following button type:

4- Sweep
Three different sweep modes are always displayed and available on the screen

- Auto Sweep: Automatic search and display of the signal inside the equipment wavelength range.
- Single Sweep: A one time sweeping is done according to the start/stop or the center/span parameters.
- Repeat Sweep: This Sweeping mode repeats a sweep as many times as you need until you press the stop button.
5- Cursors settings

Three different cursors can be selected:

Zoom function:
While the top trace shows the complete span, the larger bottom trace represents the “zoomed-in” area. The Zoom function can easily be activated by drawing a rectangle at a specific area on the touch sensitive screen and can be repeated multiple times until the desired details become visible.

Scroll function:
The “zoomed-in” area can easily be moved by using the scroll function. The zoom can be kept and displaced inside the entire span.

Delta function:
This function is very useful for performing a quick delta measurement. This function draws a line and gives the (WL and power) deltas between the two extreme points of the line.

6- Full span display

This function will enable/disable the panoramic full span graph display.

7- Traces

Up to 6 different traces are available. Each trace can be displayed or blanked.

8- Lines and Markers

These 2 functions allow you to position benchmarks accurately on the trace.

- Two horizontal and two vertical lines can be displayed on the graph providing the absolute positions and the delta values between them.

- Up to five hundred markers can be positioned. A marker table can be displayed with all the marker information and saved in txt format.

9- Analysis functions

Useful functions are provided for fast analysis:

- Peak Search
- Line Width
- SMSR
- SNR
- Trace A - B
- etc.

TUNABLE LASER SOURCE SOFTWARE

This optional software allows you to control the internal Tunable Laser Source. Fixed wavelength or sweeping modes are possible. Two kinds of sweeps are available, continuous or step by step.

TRACKING GENERATOR

Thanks to this option, the internal TLS and the OSA sweepings are synchronised. The OSA is able to measure the insertion loss/gain of a DUT (Bragg grating, multiplexer, tunable filter, amplifier...) with a dynamic of 70 dB.

POWER METER

The internal power meter measures the average power value of the input signal. The power of the two independent polarization channels and the total power can be displayed simultaneously.
Ultra high resolution OSA AP2040 series

<table>
<thead>
<tr>
<th></th>
<th>AP2041B</th>
<th>AP2043B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength measurement range</td>
<td>1525 nm to 1607 nm</td>
<td>1520 nm to 1630 nm</td>
</tr>
<tr>
<td>Wavelength span range</td>
<td>80 pm to 82 nm</td>
<td>80 pm to 110 nm</td>
</tr>
<tr>
<td>Wavelength resolution (@ 3 dB)</td>
<td>5MHz/0.04pm, 10MHz/0.4pm, 20GHz/160pm</td>
<td>50GHz/0.4nm</td>
</tr>
<tr>
<td>Dynamic range</td>
<td>83 dB</td>
<td></td>
</tr>
<tr>
<td>Close-in dynamic range</td>
<td>&gt;40 dB @ +/- 0.1 pm</td>
<td>&gt;60 dB @ +/- 0.4 pm</td>
</tr>
<tr>
<td>Spurious free dynamic</td>
<td>55 dB Typical (50 dB min)</td>
<td></td>
</tr>
<tr>
<td>Sweep time</td>
<td>1s for 8 nm</td>
<td></td>
</tr>
<tr>
<td>Wavelength absolute accuracy</td>
<td>+/- 3 pm</td>
<td></td>
</tr>
<tr>
<td>Measurement level range</td>
<td>-73 dB (monochromatic) to +10dBm</td>
<td></td>
</tr>
<tr>
<td>Absolute level accuracy</td>
<td>+/- 0.3 dB (monochromatic)</td>
<td></td>
</tr>
<tr>
<td>Level repeatability</td>
<td>+/- 0.2 dB</td>
<td></td>
</tr>
<tr>
<td>Optical input</td>
<td>FC/PC for SM fiber</td>
<td></td>
</tr>
<tr>
<td>Internal absolute WL calibrator</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Display capabilities
- X scale: Wavelength in nm or frequency in GHz
- Y scale: Optical power in mW or dBm

Option OSA01
- Optical tunable laser source specifications
  - Wavelength range: 1525 nm to 1607 nm
  - Spectrum line width (@ 3 dB): 500 kHz typical
  - Output power: -8 dBm typical
  - SMSR: >45 dBc
  - ASE: < -40 dBc over 0.1 nm
  - RIN: < -135 dB/Hz
  - Wavelength stability: +/- 10 pm over 1 hour
  - Power stability: +/- 0.09 dB over 1 hour
  - Fiber/connector type: Polarization maintaining fiber FC/APC connector

Option OSA02
- Optical tracking generator specifications
  - Dynamic: 63 dB
  - Resolution: 1 MHz

Option OSA08
- Optical inputs: 1 FC/PC for SM fiber input, 2 FC/PC for PM fiber inputs

a) At 1550 nm
b) At 0 dBm
c) After Wavelength calibration
d) Typical
e) Resolution 140 MHz
f) Resolution 5 MHz
g) Resolution 20 MHz
1) Relative to total signal power
2) Inside spurious free dynamic
Otherwise: possible power offset (mW) < 10⁻⁹ x total signal power (mW)
### Compact high resolution OSA AP2050 series

<table>
<thead>
<tr>
<th></th>
<th>AP2050A</th>
<th>AP2052A</th>
<th>AP2051A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wavelength measurement range</strong></td>
<td>1526 nm to 1567 nm</td>
<td>1567 nm to 1607 nm</td>
<td>1526 nm to 1607 nm</td>
</tr>
<tr>
<td><strong>Wavelength span range</strong></td>
<td>170 pm to 41 nm</td>
<td>170 pm to 40 nm</td>
<td>170 pm to 81 nm</td>
</tr>
<tr>
<td><strong>Wavelength resolution</strong></td>
<td>20MHz/0.16pm, 140MHz/0.12pm, 2GHz/16pm</td>
<td>10GHz/80pm, 2GHz/16pm, 50GHz/0.4nm</td>
<td>100GHz/0.8nm, 400GHz/3.2nm</td>
</tr>
<tr>
<td><strong>Dynamic range</strong></td>
<td>83 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Close-in dynamic range</strong></td>
<td>&gt;40 dB @ +/- 1.3 pm</td>
<td>&gt;60 dB @ +/- 8 pm</td>
<td>&gt;70 dB @ +/- 30 pm</td>
</tr>
<tr>
<td><strong>Spurious free dynamic</strong></td>
<td>50 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sweep time</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wavelength absolute accuracy</strong></td>
<td>+/- 3 pm</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Measurement level accuracy</strong></td>
<td>-73 dBm (monochromatic) to +10 dBm</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Absolute level accuracy</strong></td>
<td>+/- 0.3dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Level repeatability</strong></td>
<td>+/- 0.2dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optical input</strong></td>
<td>FC/PC for SM fiber</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Internal absolute WL calibrator</strong></td>
<td>Yes</td>
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### Optimal tunable laser source specifications

<table>
<thead>
<tr>
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<th>AP2051A</th>
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</thead>
<tbody>
<tr>
<td><strong>Wavelength range</strong></td>
<td>1526 nm to 1567 nm</td>
<td>1567 nm to 1607 nm</td>
<td>1526 nm to 1607 nm</td>
</tr>
<tr>
<td><strong>Spectrum line width</strong></td>
<td>3 MHz Typical</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output power</strong></td>
<td>-8 dBm typical</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ASE</strong></td>
<td>&lt; - 50 dBc over 0.1 nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RIN</strong></td>
<td>-135 dB/Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wavelength stability</strong></td>
<td>1 pm @ 15 min, 2 pm @ 1 h</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power stability</strong></td>
<td>0.07 dB @ 15 min, 0.09 dB @ 1 h</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fiber/connector type</strong></td>
<td>Polarization maintaining fiber FC/APC connector</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Optical tracking generator specifications

<table>
<thead>
<tr>
<th></th>
<th>60 dB</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dynamic</strong></td>
<td>10 MHz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Optical inputs specifications

|                         | 1 FC/PC for SM fiber input | 2 FC/PC for PM fiber inputs |

### 5 MHz wavelength resolution instead of 20 MHz

|                         | >40 dB @ +/- 0.1 pm | >60 dB @ +/- 0.4 pm | >80 dB @ +/- 6 pm |

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**Notes:**
- a) At 1550 nm
- b) AT 0 dBm
- c) After Wavelength calibration
- d) Typical
- e) Resolution 140 MHz
- f) Resolution 5 MHz
- g) Resolution 20 MHz
- h) Relative to total signal power
- i) Inside spurious free dynamic
- Otherwise: possible power offset (mW) < 10 x total signal power (mW)
APEX Technologies

APEX Technologies is located in Marcoussis in the French Optics Valley. The company was founded in 1998 and our first equipment has been shipped in 2001. We develop and produce innovative ultra high performance test equipment intended for fiber optic telecommunications research. Our policy “knowledge is power” reflects our work ethic. APEX Technologies is a company centred around a strong research team, our goal is to stay at the top of the advanced technology...

Related products

Optical Complex Spectrum Analyzer:
This equipment is also based on an interferometric method and is able to measure spectrums with the same specifications as the AP2040 series instruments. It also has the added benefit of measuring phase as a function of frequency. The phase and intensity information can then be used to calculate chirp, phase, alpha parameter or pulse shape as a function of time, furthermore it can display constellation, phase and intensity eye diagrams. This equipment has no modulation format and bit rate limitation.

Multitest platform and plug-in modules:
A mainframe can control several plug-in modules (Tunable Laser Source, Power Meters, Switches, Tunable Attenuators...). Special methods have been developed for these products to be cost effective and still offer ultra high performance.

For further information or to book a demonstration, contact us or your local distributor.

Your local contact.

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