

Optical Spectrum Analyzer

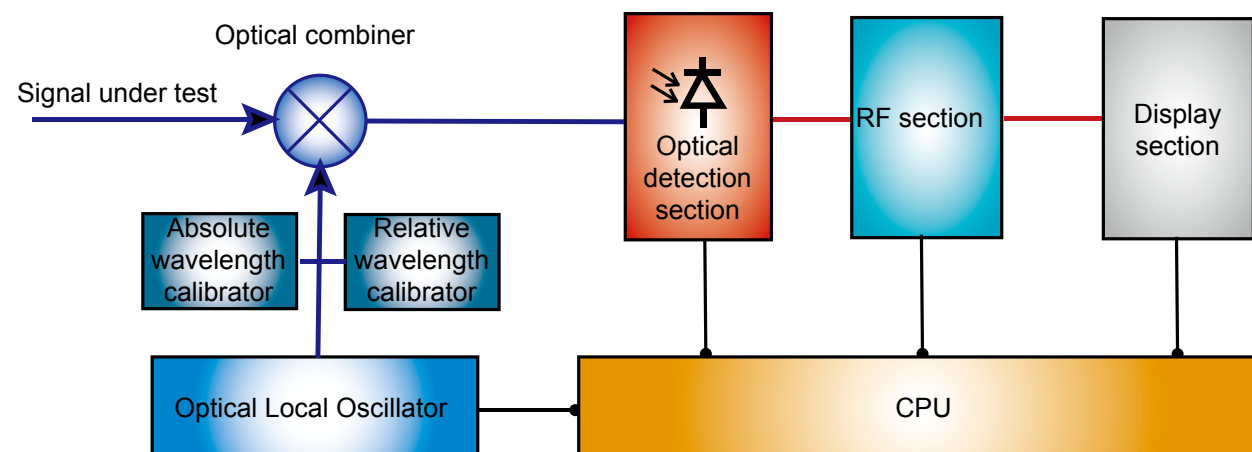
AP2050A/AP2052A

- Ultra-high resolution : 0.8 pm (100MHz)
- High close-in dynamic range : 50dB@+/-6pm
- High absolute wavelength accuracy : +/-3pm
- Ethernet and GPIB remote control
- Measurement level range : -70dBm up to +10dBm
- All-in-one equipment (no need of external equipment)



Principle

Based on an interferometric principle, the AP2050A/2052A can achieve a 12 times better resolution than monochromator based Optical Spectrum Analyzer.



Specifications are subject to change without notice.
March 2008

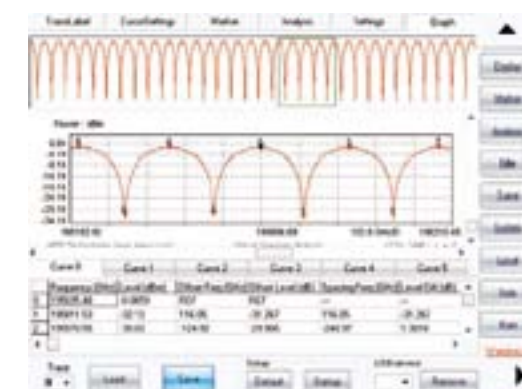
Main frame and software specifications

| | |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| OSA software functionalities | Auto measurement, zoom function, zoom to scale, auto calibration, peak search, line width, SMSR, markers, horizontal and vertical lines, peak centre,... |
| Trace | Up to 6traces |
| Screen | 10.4inch, color TFT, |
| Front keyboard | Yes |
| USB connector | Yes |
| Internal memory | More than 1,000 traces |
| File format | Trace file (.dat, .txt), setup file, screen copy (.bmp), marker table |
| Mouse and keyboard connector | Yes (USB type in front panel) |
| GPIB | Yes |
| Ethernet | Yes (10/100 base T) |
| Operating temperature | +10°C to +35°C |
| Power requirement | AC 100 to 120V / 200 to 250V, 50/60Hz |
| Optical input | FC/PC SMF28 |

| | AP2050A | AP2052A |
|-----------------------------------------------|----------------------------------------------|------------------|
| Optical spectrum analyzer specifications | | |
| Wavelength measurement range | 1525nm to 1567nm | 1570nm to 1608nm |
| Wavelength span range | 80pm to 42nm | 80pm to 38nm |
| Wavelength absolute accuracy ^{a b c} | +/-3pm | |
| Wavelength resolution(@3dB) ^d | 100 MHz (0.8 pm), in option 20 MHz (0.16pm) | |
| Measurement level range ^{a e} | -70dBm (monochromatic) to +10dBm | |
| Absolute level accuracy ^{a b e} | +/- 0.3dB | |
| Level repeatability ^{a b d e} | +/- 0.2dB | |
| Close-in dynamic range ^{a b e} | >40 dB @ +/- 2pm | >50dB @ +/- 6pm |
| Spurious free dynamic ^d | 60dB | |
| Sweep time ^{d e} | 1s for 1.5nm | |
| Optical input | FC/PC for SM fiber | |
| Tunable laser output | >-7dBm | |
| Internal absolute WL calibrator | Yes | |
| Display capabilities | | |
| X scale | Wavelength in nm or frequency in GHz | |
| Y scale | Optical power in mW or dBm | |

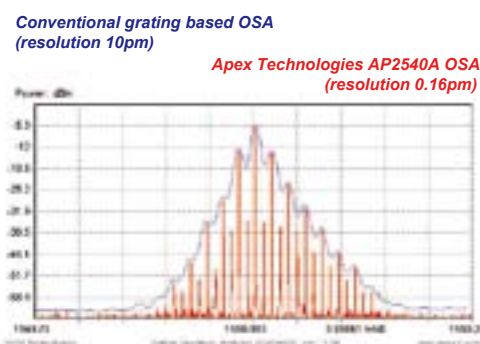
- a) At 1550nm
b) At 0dBm
c) After wavelength calibration
d) Typical
e) Resolution 100MHz

| Options | |
|--------------|---------------------------------------------------------------------------------------------------------------------|
| OSA07 | Continuous and step by step Optical Tunable laser source + Optical tracking generator for transmission measurements |



series Multi-channel Optical Spectrum Analyzer

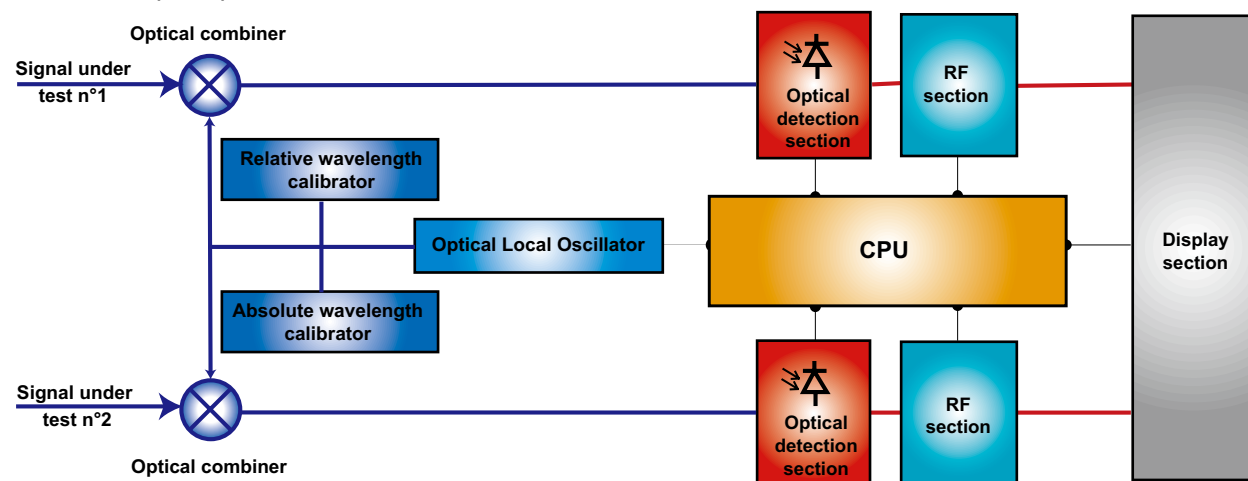
AP2540A



The AP2540A series offer the most economical solution when more than one optical spectrum analyzer is required. Based on an interferometric principle, the AP2540A series achieve a 0.16pm resolution (20MHz) at an absolute wavelength accuracy of +/-3pm and has a close-in dynamic range of 60dB at 10pm. Standard configurations range from 2 up to 6 channels and additional channels are possible upon request.

Principle

Dual channel principle :



Specifications are subject to change without notice.

Ordering information

- AP2540A-x** : C band (1520nm to 1567nm) Optical spectrum analyzer
Specify number of channels : 2, 4 or 6 (more upon request)
- AP2541A-x** : C band (1520nm to 1567nm) and L band (1557nm to 1607nm) Optical spectrum analyzer
Specify number of channels : 2, 4 or 6 (more upon request)
- AP2543A-x** : C+L band (1520nm to 1630nm) Optical spectrum analyzer
Specify number of channels : 2, 4 or 6 (more upon request)

Specifications are subject to change without notice.

Specifications

| | AP2540A-x | AP2541A-x | AP2543A-x |
|-----------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------|
| Wavelength measurement range | 1520nm to 1567nm | 1520nm to 1567nm & 1557nm to 1607nm | 1520nm to 1630nm |
| Wavelength span range | 80pm ^f to 47nm | 80pm ^f to 87nm | 80pm ^f to 110nm |
| Measurement sampling interval ^g | 0.5MHz (0.004pm) Max. (Span (80pm) / Number of measured and displayed points (20,000pts)) | | |
| Wavelength absolute accuracy ^{a b c} | +/-3pm | | |
| Wavelength resolution (@3db) ^d | 20MHz (0.16pm) and 100MHz (0.8pm) | | |
| 2 channel level range ^{a e} | -67dBm to +20dBm | | -64dBm to +20dBm |
| 4 channel level range ^{a e} | -64dBm to +20dBm | | -61dBm to +20dBm |
| 6 channel level range ^{a e} | -61dBm to +20dBm | | -58dBm to +20dBm |
| Absolute level accuracy ^{a b e} | +/-0.3dB | | |
| Level repeatability ^{a b d e} | +/-0.2dB | | |
| Close-in dynamic range ^{a b} | >40dB @ +/-2pm 60dB @ +/-10pm | | 60dB @ +/-1.7pm |
| Spurious free dynamic ^d | >60dB | | >45dB |
| Sweep time ^{d e} | 5s for 55nm | | 8s for 110nm |
| Optical input | FC/PC, SMF-28 fiber | | |
| Tunable laser output | >-5dBm | | >-7dBm |
| Internal absolute WL calibrator | Yes | | |

| | |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Software features | Auto measurement, Zoom function, Zoom to scale, Auto calibration, Peak search, Line width, SMSR, Markers, Horizontal and vertical lines, Peak center, and more |
| Display | |
| X scale | Wavelength in nm or Frequency in THz |
| Y scale | Power in linear or logarithmic mode |
| Trace | Up to 6 traces |
| Screen | 10.4inch, color TFT, 640x480pixels |
| Front keyboard | Yes |
| Touch sensitive screen | Yes |
| USB interface | 1x on front panel, 2x on back panel |
| Internal memory | More than 1,000 traces |
| File format | Trace file (.dat, .txt), Setup file, Screen copy (.bmp), Marker table |
| Mouse and keyboard connections | Yes (PS2 type on front panel) |
| GPIO | IEEE-488 |
| Ethernet | Yes (10/100 base T) |
| Operating temperature | +10°C to +35°C |
| Power requirements | AC 100 to 120V / 200 to 250V, 50/60Hz |
| Accessories | Touch sensitive pen |

- a) At 1550nm
b) At 0dBm
c) After wavelength calibration
d) Typical
e) Resolution 100MHz
f) Minimum span for 20,000pts. Zoom down this value is possible.
g) Resolution 20MHz

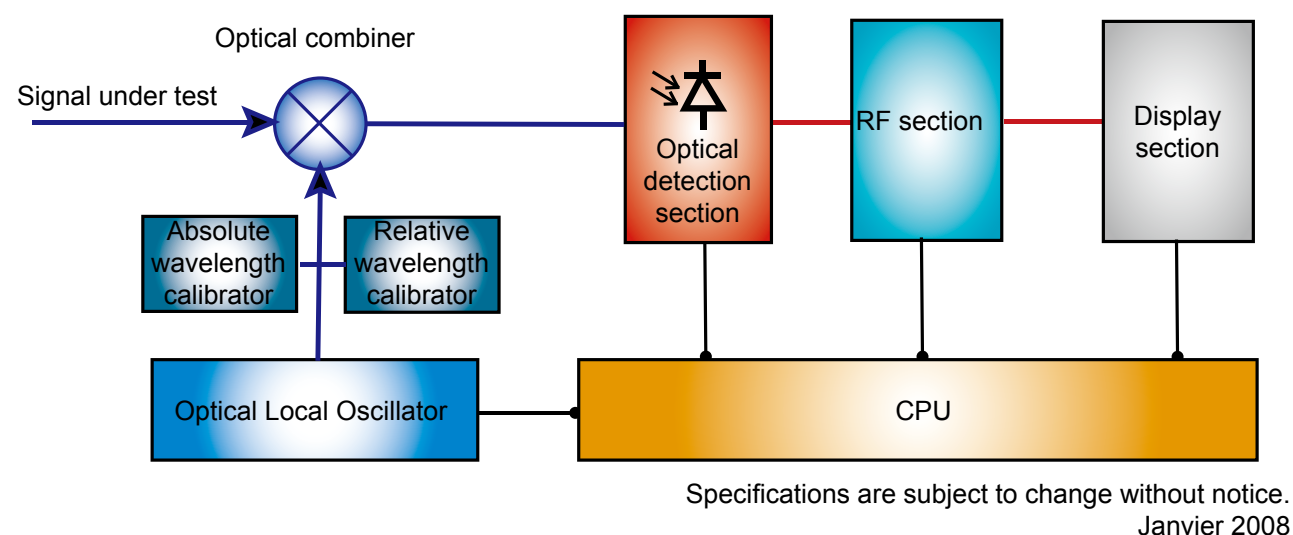
Optical Spectrum Analyzer

AP2041B/AP2043B

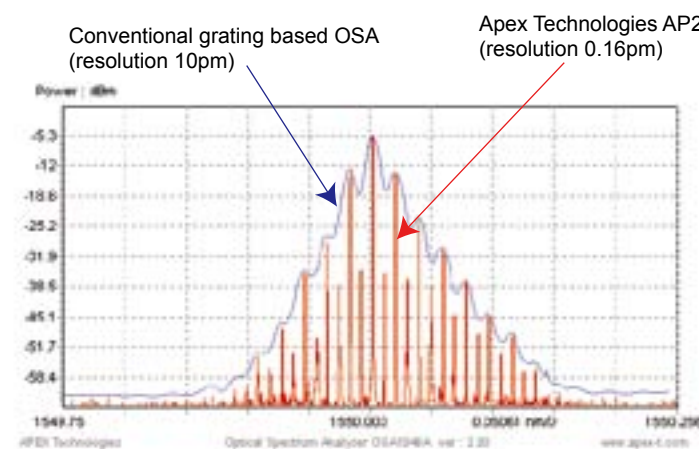
- Ultra-high resolution : 0.16pm (20MHz)
- High close-in dynamic range : 60dB@+/-3pm
- High absolute wavelength accuracy : +/-3pm
- Ethernet and GPIB remote control
- Measurement level range : -70dBm up to +10dBm
- All-in-one equipment (no need of external equipment)

Principle

Based on an interferometric principle, the AP2041B/2043B can achieve a 62 times better resolution than monochromator based Optical Spectrum Analyzer.

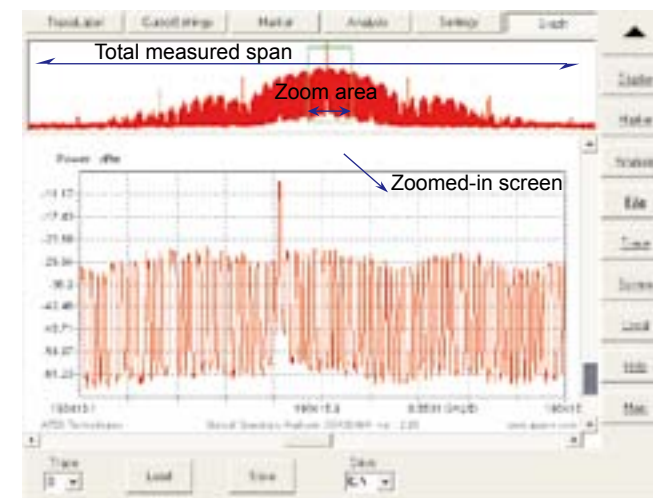


Measurement examples



AP2041B/AP2043B comparison with a grating based OSA :

This is a direct comparison between the two different Optical Spectrum Analyzer types measuring a 1.25GHz modulated signal. The AP2041B/AP2043B clearly shows approx. 62 times more detail than the grating based OSA and leaves any kind of guess work behind.



Zoom function :

This is a 10Gb/s modulated signal (PRBS 2⁷-1) measured with the AP2041B/AP2043B.

By utilizing the AP2041B/AP2043B's built-in zoom function, all frequencies generated by the modulation can be made visible and used for analysis.

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 available.

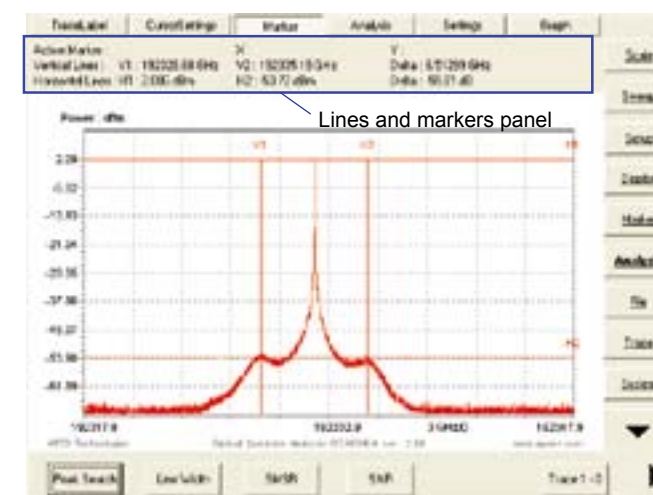
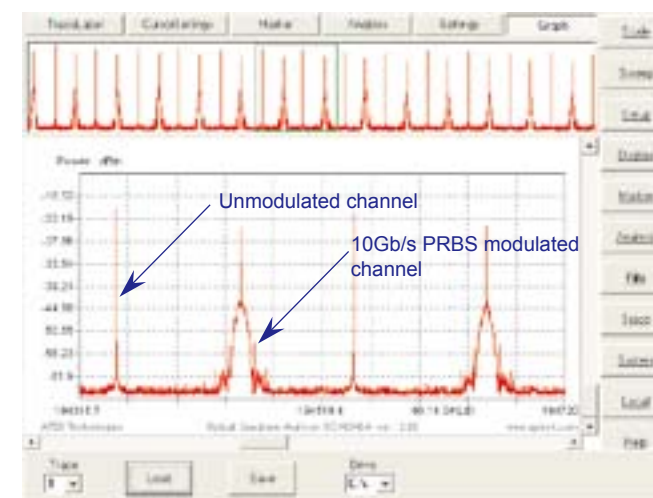
(C/D)WDM applications:

This is an AP2041B/AP2043B measurement of a 100GHz spaced WDM system carrying modulated and unmodulated signals.

Thanks to the ultra high resolution of the AP2041B/AP2043B, channel and even modulation types can easily be identified; in this particular case the 10Gb/s NRZ modulated signal is clearly recognized.

In D-WDM systems low channel crosstalk is crucial for optimum system performance and can easily be analyzed due to the AP2041B/AP2043B's 0.16pm wavelength resolution, and adjusting channels in the ITU grid is no longer a challenge thanks to the leaves any kind of guess work behind.

+/-3pm absolute wavelength accuracy of the AP2041B/AP2043B.



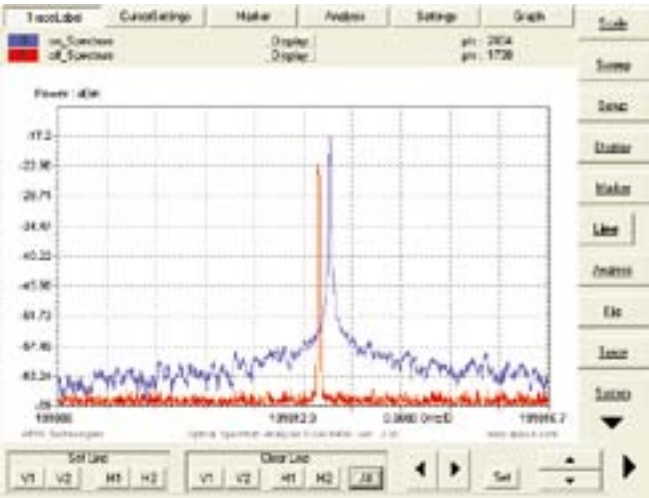
DFB relaxation oscillation :

AP2041B/AP2043B is the perfect tool for active device spectrum measurement.

In this example, a DFB laser is measured and the relaxation oscillation resonance can be analyzed giving information on the maximum direct modulation capability of the laser.

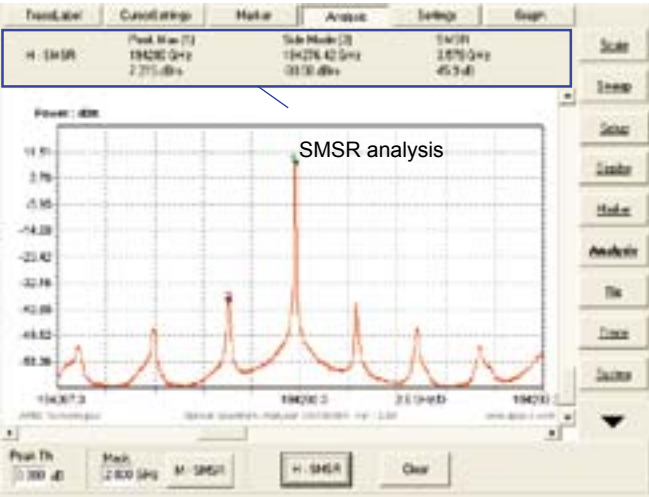
Horizontal and vertical lines can be used to measure this parameter. Lines can be moved directly by pointing on the screen or by using a mouse. Lines and marker value are displayed on the top of the screen.

Measurement examples



Laser spectrum widening :

In this example the same laser have been measured before and after transmission thru different optical components. The widening of the spectrum can be seen and measured. The built-in linewidth analysis function can be use to easily characterize the linewidth of the signal under test.



Side Mode Suppression Ratio of tunable lasers :

Tunable lasers source (TLS) are commonly used in WDM systems but cavity modes generating sidebands close to the main peak can have an influence on system performance (when TLS is modulated). With AP2041B/AP2043B sidebands can be measured easily with the built-in SMSR function. AP2041B/AP2043B.

Specifications

| | AP2041B | AP2043B |
|-----------------------------------------------|-----------------------------------|------------------|
| Wavelength measurement range | 1525nm to 1607nm | 1520nm to 1630nm |
| Wavelength span range | 80pm to 82nm | 80pm to 110nm |
| Wavelength absolute accuracy ^{a b c} | +/-3pm | |
| Wavelength resolution (@3db) ^d | 20MHz (0.16pm) and 100MHz (0.8pm) | |
| Measurement level range ^{a e} | -70dBm (monochromatic) to +10dBm | |
| Absolute level accuracy ^{a b e} | +/-0.3dB | |
| Level repeatability ^{a b d e} | +/-0.2dB | |
| Close-in dynamic range ^{a b e} | >40dB @ +/-1pm >60dB @ +/-3pm | |
| Spurious free dynamic ^d | 55dB Typical (50dB min) | |
| Sweep time ^{d e} | 5s for 55nm | 8s for 110nm |
| Optical input | FC/PC for SM fiber | |
| Tunable laser output | Yes | |
| Internal absolute WL calibrator | >-7dBm | |

| | |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Software features | Auto measurement, Zoom function, Zoom to scale, Auto calibration, Peak search, Line width, SMSR, Markers, Horizontal and vertical lines, Peak center, ... |
| Display | |
| X scale | Wavelength in nm or Frequency in THz |
| Y scale | Power in linear or log |
| Trace | Up to 6 traces |
| Screen | 10.4inch, color TFT, 640x480pixels |
| Front keyboard | Yes |
| Touch sensitive screen | Yes |
| USB interface | 1x on front panel, 2x on back panel |
| Internal memory | More than 1,000 traces |
| File format | Trace file (.dat, .txt), Setup file, Screen copy (.bmp), Marker table |
| Mouse and keyboard connections | Yes (PS2 type on front panel) |
| GPIO | Yes |
| Ethernet | Yes (10/100 base T) |
| Operating temperature | +10°C to +35°C |
| Power requirements | AC 100 to 120V / 200 to 250V, 50/60Hz |
| Accessories | Touch sensitive pen |

- a) At 1550nm
- b) At 0dBm
- c) After wavelength calibration
- d) Typical
- e) Resolution 100MHz

Ordering informations

AP2041B : C+L band Optical Spectrum analyzer
AP2043B : Extended C+L band Optical Spectrum analyzer

Optical Complex Spectrum Analyzer

AP2441B/AP2443B



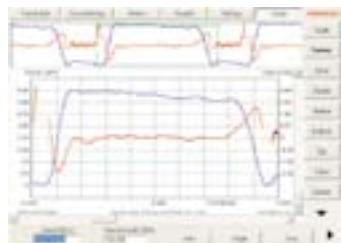
TIME DOMAIN MEASUREMENT

Temporal resolution 75fs max., bandwidth >6THz max.

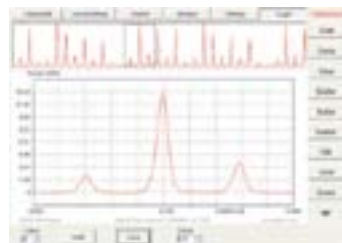
FREQUENCY DOMAIN MEASUREMENT

Resolution 20MHz (0.16pm), C and L band

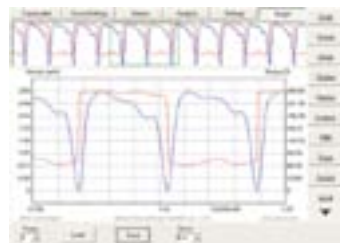
CHIRP & PULSE



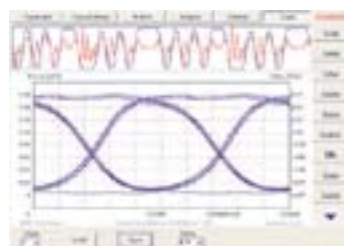
SHORT PULSES



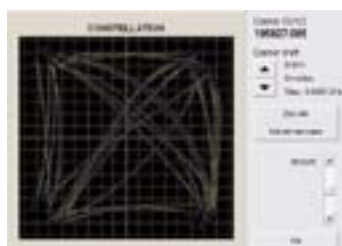
PHASE MODULATION



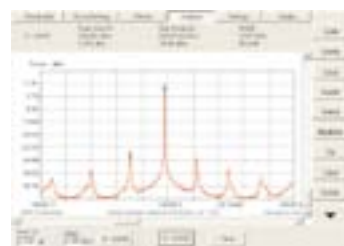
PHASE & INTENSITY EYE DIAGRAM



CONSTELLATION



ULTRA HIGH RESOLUTION OPTICAL SPECTRUM ANALYZER



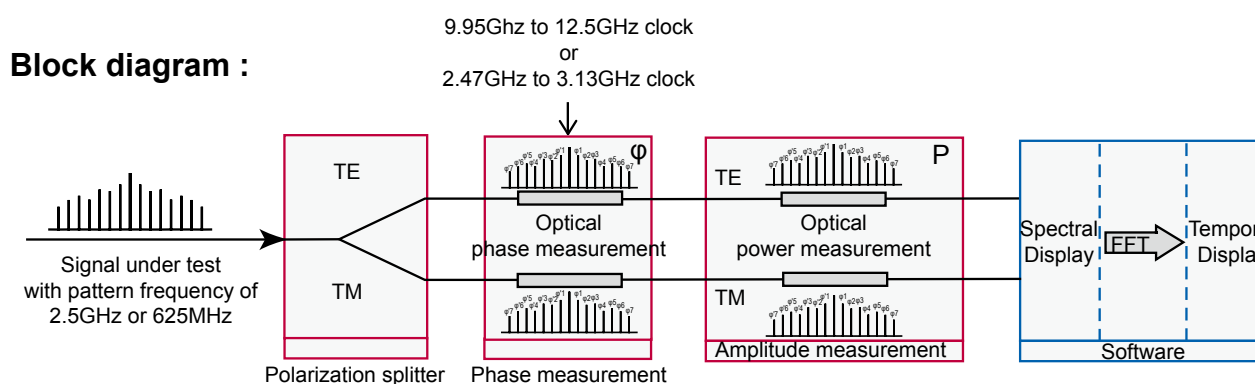
Measurement principle

While optical spectrum analyzer can only measure power of a modulated signals, Apex Technologies complex spectrum analyzer is able to measure also the optical phase.

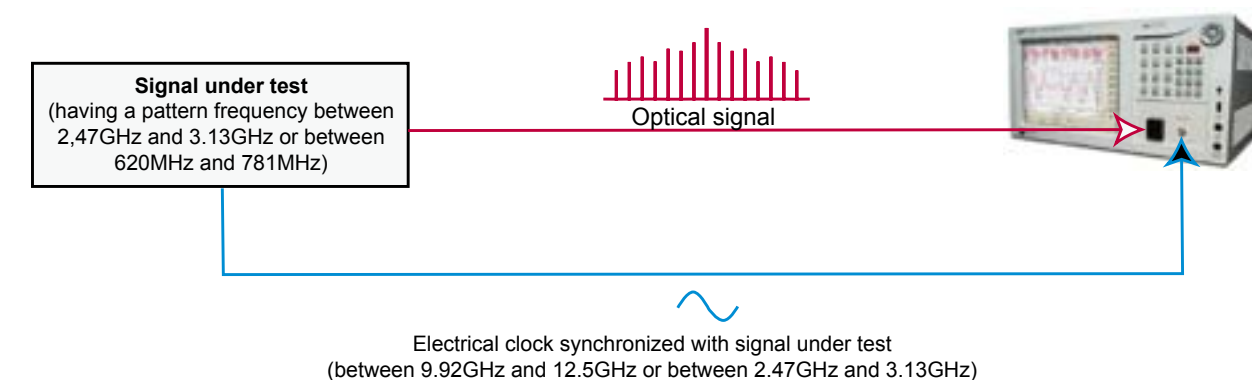
The patented method of the AP2441B/AP2443B is based upon a spectral analysis of the optical field, of which the amplitude and the phase of each frequency component are analyzed when all components are spaced by a fixed frequency ($F_{r1}=2.5\text{GHz}$ or $F_{r2}=625\text{MHz}$).

By knowing the amplitude and the phase of each spectral component, the temporal variations of the amplitude and the phase are calculated by the Fourier transform, providing the intensity and the chirp or phase as a function of time.

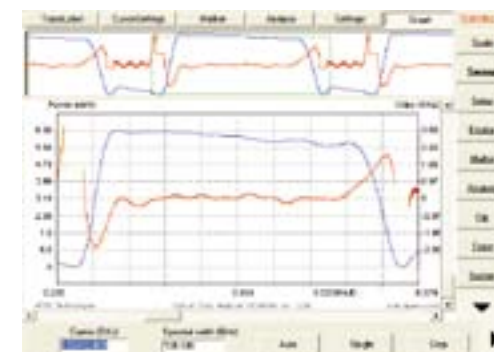
Block diagram :



Measurement configuration



Application examples



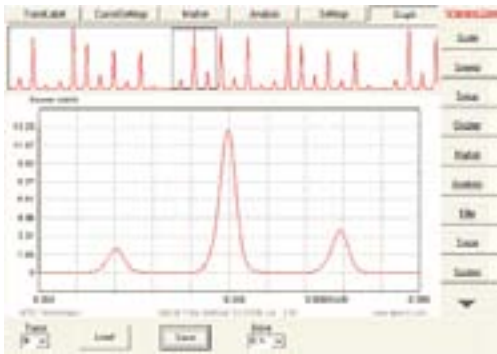
Time resolved chirp measurement :

Time resolved chirp is an important parameter to predict transmitters performances in a transmission system.

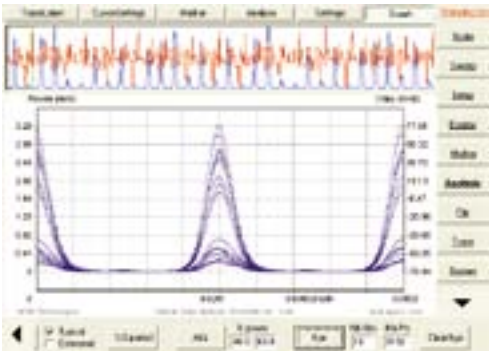
AP2441B/AP2443B is the best solution in question of accuracy, repeatability and measurement time, for chirp measurement at high bit rates.

Moreover Apex Technologies complex spectrum analyzer can measure the optical pulse shape in the same measurement.

For mach-zehnder modulator, it is also possible to display the Alfa parameter instead of the chirp.



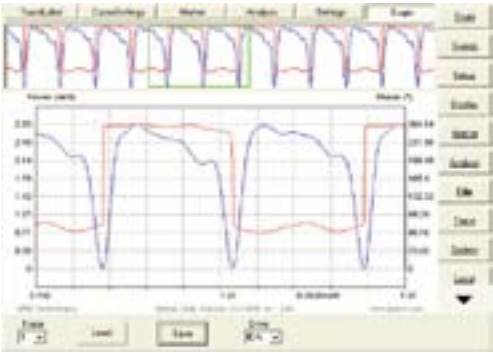
Mode locked fiber laser pulse measurement
(4ps pulsewidth)



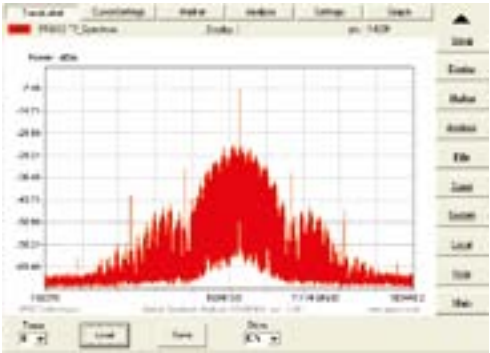
Eye diagram analysis of
a mode locked fiber laser pulse

Short pulses measurement :

Thanks to the complex spectral analysis principle, the bandwidth of AP2441B/AP2443B is determined by the wavelength range of the instrument.
So, the maximum temporal resolution of AP2441B/AP2443B is 75fs, giving the capability to measure ultra short pulses used in high bit rates systems.
Compared to a standard oscilloscope having a maximum bandwidth of 80GHz, AP2441B/AP2443B have a maximum bandwidth >6THz!



10Gb/s DPSK modulation
(phase in red and intensity in blue)



10Gb/s PRBS spectrum

Optical phase measurement :

A lots of new modulation formats appeared using intensity but also phase modulation in long distance optical transmission.
Apex Technologies complex spectrum analyzer is the only instrument able to measure these phase modulations.
It is now possible to characterize directly a phase modulation in a DPSK, QPSK, Duo-binary... modulation.
AP2441B/AP2443B can also be used as an ultra high resolution OSA to characterize spectral width of modulated signals.

Specifications

Main frame and software specifications

| | |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OSA software functionalities | Auto measurement, Zoom function, Zoom to scale, Auto calibration, Peak search, Line width, SMSR, Markers, Horizontal and vertical lines, Peak center, ... |
| Complex OSA software functionalities | Auto measurement, Zoom function, Averaging function, Auto calibration, Alfa parameter analysis, Eye diagram, Polarization analysis, Accuracy function, Total power measurement... |
| Trace | Up to 6 traces |
| Screen | 10.4inch, color TFT, 640x480pixels |
| Fron keyboard | Yes |
| Touch sensitive screen | Yes |
| USB connector | 1x front panel, 2x back panel |
| Internal memory | More than 1,000 traces |
| File format | Trace file (.dat, .txt), Setup file, Screen copy (.bmp), Marker table |
| Mouse and keyboard connector | Yes (PS2 type in front panel) |
| GPIO | Yes |
| Ethernet | Yes (10/100 base T) |
| Operating temperature | +10°C to +35°C |
| Power requirement | AC 100 to 120V / 200 to 250V, 50/60Hz |
| Accessories | Touch sensitive pen |
| Optical input | FC/PC SMF28 |
| Clock input | SMA |

Optical spectrum analyzer specifications

| | AP2441B | AP2443B |
|-----------------------------------------------|--------------------------------------|------------------|
| Wavelength measurement range | 1525nm to 1607nm | 1520nm to 1630nm |
| Wavelength span range | 80pm to 82nm | 80pm to 110nm |
| Wavelength absolute accuracy ^{a b c} | +/-3pm | |
| Wavelength resolution (@3db) ^d | 20MHz (0.16pm) and 100MHz (0.8pm) | |
| Measurement level range ^{a e} | -70dBm (monochromatic) to +10dBm | |
| Absolute level accuracy ^{a b e} | +/-0.3dB | |
| Level repeatability ^{a b d e} | +/-0.2dB | |
| Close-in dynamic range ^{a b e} | >40dB @ +/-1pm >60dB @ +/-3pm | |
| Spurious free dynamic ^d | 55dB Typical (50dB min) | |
| Sweep time ^{d e} | 5s for 55nm | 8s for 110nm |
| Optical input | FC/PC for SM fiber | |
| Tunable laser output | Yes | |
| Internal absolute WL calibrator | >-7dBm | |
| Display capabilities | | |
| X scale | Wavelength in nm or Frequency in THz | |
| Y scale | Power in linear or log | |

a) At 1550nm
b) At 0dBm
c) After wavelength calibration

d) Typical
e) Resolution 100MHz

Optical complex spectrum analyzer specifications

| | AP2441B | AP2443B |
|------------------------------------------|------------------------------------------------------------------------------|------------------|
| Wavelength measurement range | 1525nm to 1607nm | 1520nm to 1630nm |
| Clock frequency | Fclk1 = 9.92GHz to 12.5GHz or Fclk2=2.47GHz to 3.13GHz | |
| Clock power | 0 to +10dBm | |
| Pattern frequency | Fr1=2.48GHz to 3.12GHz and Fr2=620MHz to 781MHz (see pattern table below) | |
| Measurement level range ^c | -55dBm to +10dBm | |
| Maximum temporal resolution ^a | 95fs | 75fs |
| Chirp accuracy ^b | +/-60MHz | |
| Measurement time ^b | 5s | 7s |
| Display capabilities | | |
| X scale | Time in ps or Wavelength in nm or Frequency in THz | |
| Y scale | Intensity in mW or dBm, chirp in GHz, Phase in degree, Alfa parameter | |

a) If modulated signal cover the complete wavelength range
b) Maximum chirp deviation measured on a 2.5GHz sinusoidal signal with 30% modulation ratio
c) Power range of complex spectrum components for an accurate analysis

Optical complex spectrum analyzer pattern length

| Bit rate | 2.48Gb/s to 3.12Gb/s | 9.92Gb/s to 12.5Gb/s | 39.68Gb/s to 50Gb/s | 79.36Gb/s to 100Gb/s | 158.72Gb/s to 200Gb/s | 317.44Gb/s to 400Gb/s | 634.88Gb/s to 800Gb/s |
|------------------------|-------------------------|-------------------------|------------------------|-------------------------|--------------------------|--------------------------|--------------------------|
| Pattern length for Fr1 | 1bit | 4bits | 16bits | 32bits | 64bits | 128bits | 256bits |
| Pattern length for Fr2 | 4bits | 16bits | 64bits | 128bits | 256bits | 512bits | 1024bits |

Optical Tunable Laser Source Module

AP3350A/AP3352A

- C-band or L-band Wavelength range
- SMSR 50 dB @ 0.1 nm resolution
- Wavelength setting resolution < 1 pm
- Wavelength stability: 1 pm @ 15 min, 2 pm @ 1 h
- The TLS Modules must be inserted inside the mainframes controllers AP1000-2/AP1000-8
- Optical output level: +10 dBm typical (option only for C-band +13 dBm typical)



Specifications

| | AP3350A | AP3352A |
|---------------------------------------------|---------------------------------------------------------------|------------------|
| Optical Tunable Laser Source specifications | | |
| Wavelength range | 1525nm to 1567nm | 1570nm to 1608nm |
| Wavelength tunable range | 10pm to 42nm | 10pm to 38nm |
| Spectrum line width @ 3 dB | 3 MHz Typical 10 MHz maximum | |
| Output power | +10 dBm typical, +9 dBm min (option only for AP3350A +13 dBm) | |
| Output adjustment | 40 dB | |
| SMSR | 51 dB @ 0.1 nm resolution | |
| ASE | 50 dB @ 0.1 nm resolution | |
| Optical isolation | 25 dB | |
| RIN | -135 dB/Hz | |
| Wavelength stability @ + 9dBm | 1 pm @ 15 min, 2 pm @ 1h | |
| Power stability @ + 9 dBm | 0.01 dB @ 15 min, 0.02 dB @ 1h | |
| Tuning speed | 1.5 nm/s | |
| Fiber/connector type | Polarization maintaining fiber FC/APC connector | |
| Operating temperature | 15°C to 35°C | |
| Weight | 530 g | |
| Dimensions (W x H x D) | 35 x 130 x 175 mm | |



Specifications

| | AP1000-2 | AP1000-8 |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Mainframe controller specifications | | |
| Modules room | 2 | 8 |
| Mainframe Software Functionalities | Wavelength sweep mode (continuous and step by step), Static mode, ITU Grid, personalised Grid, power adjustment, output power monitoring display | |
| USB connectors | 3 in the front panel | |
| Internal memory | Yes | |
| File Format | Txt format | |
| GPIO | Yes | |
| Ethernet | Yes | |
| Mouse and Keyboard | Yes USB Type in front panel | |
| Screen | 5.7 inch sensitive screen | |
| Operating temperature | 15°C to 35°C | |
| Power requirement | AC 100 to 120 V/ 200 to 250 V, 50/60Hz | |

Modules

- | | | |
|------------------------------------|-----------------------------------------|-------------------------------------------------|
| • Tunable Laser Source (available) | • Coupler (available) | • Polarization controller (available in 2010) |
| • OSA (available in 2010) | • Tunable attenuator (available) | • EDFA (available in 2010) |
| • Complex OSA (available in 2010) | • Tunable filter (available in 2010) | • Broadband source (available in 2010) |
| • Power meter (available) | • DPSK demodulator (available in 2010) | • Modulator + driver 10Gb/s (available in 2010) |
| • Switches (available) | • DQPSK demodulator (available in 2010) | • Modulator + driver 40Gb/s (available in 2010) |

Hand-held Optical Power Meters

AP3010

General

The AP3010 series are high accuracy hand-held fiber optic power meters suitable for any type of power and loss measurements. With 3 different models available, the AP3010 series enables measurements within the range of 650nm to 1550nm with a dynamic range varying between +30dBm and -70dBm. The large LCD makes reading obtained results very easy and its ruggedized housing proves it to be the ideal instrument for harsh field applications.

Features

- Large size LCD display
- Auto turn-off and auto clear
- Compact and ruggedized
- Power, attenuation and relative display
- Low battery indicator
- InGaAs and Si detector types
- +30dBm measurement ceiling with the AP3016
- Excellent price-performance ratio!

Specifications

| Model | AP3011 | AP3013 | AP3016 |
|---------------------------|-------------------------|-----------------------------|------------------------|
| Detector type | Si | InGaAs | InGaAs |
| Wavelength range | 400nm to 1050nm | 800nm to 1700nm | 1000nm to 1700nm |
| Operation wavelength (nm) | 660, 670, 780, 820, 850 | 850, 1300, 1310, 1480, 1550 | 1300, 1310, 1480, 1550 |
| Measurement range | -70dBm to +5dBm | -70dBm to +5dBm | -50dBm to +30dBm |
| Accuracy | ±/-5% | | |
| Optical interface | FC adapter | | |
| Resolution | 0.01dBm | | |
| Operating Power | 2 x 1.5V, AAA batteries | | |
| Operating temperature | 0°C to +40°C | | |
| Storage temperature | -20°C to +70°C | | |
| Dimensions | 35mm x 60mm x 125mm | | |

Ordering information

AP3011 : Silicon, 400nm to 1100nm hand held optical power meter +5dBm to -70dBm
AP3013 : InGaAs, 800nm to 1700nm hand held optical power meter +5dBm to -70dBm
AP3016 : InGaAs, 1000nm to 1700nm hand held optical power meter +30dBm to -50dBm

Hand-held Optical Power Meters

AP3110

General

The AP3110 series are high accuracy hand-held fiber optic power meters suitable for any type of power and loss measurements. With 2 different models available, the AP3110 series enables measurements within the range of 800nm to 1700nm with a dynamic range varying between +33dBm and -70dBm. The large LCD makes reading obtained results very easy and its ruggedized housing proves it to be the ideal instrument for harsh field applications. The interangeable adaptor permits to connect different connector types, and the AP3110 series can be connected to a computer thanks to its RS232 connector.

Features

- Large size LCD display
- High accuracy and long term stability
- Ruggedized design
- Power, attenuation and relative display
- Max/Min recording for power fluctuation test
- Powered by internal battery (2x1.5V) or external adater
- Low battery indicator
- InGaAs detector types
- +33dBm measurement ceiling with the AP3116
- Excellent price-performance ratio!
- RS232 interface and monitoring software available

Specifications

| Model | AP3113 | AP3116 |
|---------------------------|-------------------------------------------------------------------|----------------------------------|
| Detector type | InGaAs | InGaAs |
| Wavelength range | 800nm to 1700nm | 800nm to 1700nm |
| Operation wavelength (nm) | 850, 980, 1310, 1480, 1550, 1610 | 850, 980, 1310, 1480, 1550, 1610 |
| Measurement range | -70dBm to +10dBm | -50dBm to +33dBm |
| Accuracy | ±/-3% (25°C, RH : 40% to 75%, after 15min warm up) | |
| Optical interface | Interchangeable (FC, SC, other types upon request) | |
| Resolution | 0.01dBm | |
| Operating Power | 2 x 1.5V,(AA/LR6 batteries) or DC12V adapter - Battery life >60h | |
| Operating temperature | 0°C to +40°C | |
| Storage temperature | -20°C to +70°C | |
| Dimensions and weight | Dimension : 180mm x 80mm x 25mm - Weight .<400mg | |

Ordering information

AP3113 : InGaAs, 800nm to 1700nm hand held optical power meter +10dBm to -70dBm
AP3116 : InGaAs, 800nm to 1700nm hand held optical power meter +33dBm to -50dBm
AP3110-FC : FC adapter
AP3110-SC : SC adapter
AP3110-X : Other models upon request

