TFN AM7800 Optical Spectrum Analyzer

Product Introduction

The AM7800 Optical Spectrum Analyzer is a high-performance precision instrument designed for professional spectral analysis across the 600nm to 1700nm wavelength range. Featuring exceptional wavelength accuracy of ±0.015nm and ultra-high sensitivity down to -90dBm, this advanced OSA delivers reliable measurements for both single-mode and multi-mode fiber applications. With its 10.1-inch capacitive touchscreen interface, 75dB dynamic range, and versatile connectivity options including Ethernet, USB, and GP-IB, the AM7800 streamlines optical testing workflows for telecommunications, research laboratories, and industrial manufacturing environments. Built-in wavelength calibration and automated analysis functions ensure consistent, accurate results for EDFA characterization, WDM system validation, and laser source evaluation.

Product Key Selling Points

☑ Ultra-Wide Wavelength Coverage from 600nm to 1700nm

The AM7800 covers an extensive spectral range spanning visible to near-infrared wavelengths, making it ideal for diverse applications including telecom C-band/L-band analysis, silicon photonics testing, and optical amplifier characterization. This broad coverage eliminates the need for multiple instruments, reducing capital expenditure while supporting both legacy systems and next-generation optical networks.

☑ Exceptional -90dBm High Sensitivity Detection

With industry-leading sensitivity reaching -90dBm in the 1300-1620nm range, the AM7800 captures extremely weak optical signals that conventional analyzers miss. This capability is critical

for measuring low-power outputs from optical amplifiers, evaluating passive components with high insertion losses, and ensuring accurate OSNR measurements in dense WDM systems where signal levels are often compromised.

☑ 7-Step Adjustable Resolution from 0.02nm to 2nm

Seven selectable resolution settings (0.02nm, 0.05nm, 0.1nm, 0.2nm, 0.5nm, 1nm, 2nm) provide unmatched flexibility for different measurement scenarios. Use ultra-fine 0.02nm resolution for precise DFB laser SMSR analysis, or select broader settings for rapid WDM channel overview scans. This adaptability optimizes measurement speed versus accuracy based on your specific testing requirements.

☑ 75dB Dynamic Range with Superior Stray Light Rejection

The monochromator-based optical design achieves 75dB dynamic range, enabling clear separation of closely spaced spectral signals. High stray light suppression ensures accurate measurement of small side-mode signals adjacent to powerful carrier peaks — essential for DWDM component testing, filter characterization, and high-contrast spectral analysis where weak features must be distinguished from strong background signals.

☑ Comprehensive Built-in Analysis Functions

Pre-configured measurement applications include automated EDFA-NF analysis for gain and noise figure calculation, WDM channel analysis supporting up to 1024 channels, DFB laser characterization with SMSR and linewidth measurement, and FP laser evaluation. These intelligent functions reduce operator training time, minimize manual calculation errors, and accelerate production testing throughput for optical device manufacturers.

Technical Specifications

Optical Spectrum Measurement

Parameter	Specification
Input Fiber	SM (9.5/125 μm), MMF (50/125 μm, 62.5/125 μm)
Wavelength Range	600 ~ 1700 nm
Resolution Bandwidth	0.02 ~ 2 nm
Resolution Settings	0.02nm, 0.05nm, 0.1nm, 0.2nm, 0.5nm, 1nm, 2nm
Wavelength Accuracy	±0.02 nm (1520-1620 nm); ±0.04 nm (1450-1520 nm); ±0.1 nm (Full Range)
Wavelength Repeatability	±0.005 nm (1 minute)
Wavelength Linearity	±0.01 nm (1520-1580 nm); ±0.02 nm (1450-1520 nm, 1580-1620 nm)
Minimum Sampling Resolution	0.001 nm

Power Measurement

Parameter	Specification
Power Sensitivity	-90 dBm (1300-1620nm, Resolution ≥0.05nm, HIGH3); -85 dBm (1000-1300nm, Resolution ≥0.05nm, HIGH3); -60 dBm (600-1000nm, Resolution ≥0.05nm, HIGH3)

Max Input Power	+23 dBm (All Channels, Full Range)
Power Accuracy	±0.4 dB (1310/1550nm, Input Power: -20dBm)
Power Linearity	± 0.05 dB (Input Power: -50 to +10 dBm, HIGH1/HIGH2/HIGH3)
Max Sampling Points	50001
Optical Return Loss	>35 dB (with APC connector)
Polarization Dependence	±0.05 dB (1550nm)
Optical Dynamic Range	Peak ± 0.1nm: 39 dB (Resolution: 0.02nm); Peak ± 0.4nm: 60 dB (Resolution: 0.05nm); Peak ±1.0nm: 73 dB (Resolution: 0.05nm)
Sweep Speed	0.3s (SPAN: 30nm; RES: 0.1nm; Sensitivity: MID)

General Specifications

Parameter	Specification
Display	10.1-inch 1280×800 Capacitive Touchscreen
Interfaces	USB 2.0 × 5, USB 3.0, VGA, GP-IB, Ethernet (10M/100M/1000M), RS232-DB9
Storage	128GB Hard Drive
Operating Temperature	+5 ~ +35 ° C
Storage Temperature	0 ~ +50 ° C
Power Supply	AC 100-240V, 1.7A, 50-60Hz
Dimensions	427 × 221 × 448 mm (W×H×D)
Weight	17 kg

Product Functions & Applications

- EDFA Performance Characterization & Optical Amplifier Testing

The AM7800 features a dedicated EDFA-NF analysis function that automates the complex process of measuring Erbium-Doped Fiber Amplifier performance. By capturing input and output spectra simultaneously, the system calculates gain, noise figure (NF), and amplified spontaneous emission (ASE) power with precision compliance to IEC standards. This eliminates manual data extraction errors and reduces measurement time from minutes to seconds. For optical component manufacturers and telecom operators, this capability ensures amplifier modules meet specifications before deployment, preventing costly network failures and reducing return merchandise authorization (RMA) rates. The built-in curve-fit algorithm accurately interpolates ASE levels between WDM channels, providing reliable NF measurements even in densely packed multi-channel systems.

- WDM Channel Analysis & DWDM System Validation

Supporting up to 1024 simultaneous channel measurements, the AM7800's WDM analysis function automatically detects peak wavelengths, power levels, and optical signal-to-noise ratios (OSNR) across entire C-band and L-band spectrums. The system calculates channel spacing, center wavelength deviations from ITU-T grids, and total system power with single-button operation. For network operators deploying 100G/400G coherent systems, accurate OSNR

measurement is critical because signal degradation directly impacts bit error rates. The analyzer's 75dB dynamic range enables precise noise floor measurement between closely spaced DWDM channels (50GHz spacing), ensuring compliance with stringent telecom standards and preventing channel crosstalk that causes data transmission errors.

- DFB Laser Source Characterization & Quality Control

The AM7800 provides comprehensive Distributed Feedback laser testing capabilities including center wavelength, peak power, 3dB bandwidth, side-mode suppression ratio (SMSR), and wavelength drift measurement. These parameters are essential for ensuring laser diodes meet specifications for telecom transceivers, LiDAR systems, and sensing applications. The high 0.02nm resolution enables detection of small side-modes that indicate manufacturing defects or aging degradation, while automated SMSR calculation eliminates operator interpretation variability. For photonics manufacturers, this functionality supports 100% production testing with pass/fail criteria, ensuring shipped lasers maintain stable single-mode operation throughout their operational lifetime and preventing field failures in critical communication infrastructure.

- FP Laser & Broadband Source Evaluation

For Fabry-Perot laser diodes and broadband light sources (SLD, ASE), the AM7800 measures RMS spectral width, full-width half-maximum (FWHM), mode spacing, and total integrated power. These measurements are critical for medical imaging systems, fiber optic gyroscopes, and optical coherence tomography (OCT) equipment where source characteristics directly impact system resolution and signal quality. The analyzer's 600-1700nm range covers both standard 850nm/1300nm multimode applications and specialized 1064nm industrial laser testing. By providing accurate spectral shape characterization, the AM7800 helps engineers optimize coupling efficiency into optical fibers, minimize dispersion penalties in high-speed data links, and ensure consistent performance in precision measurement instruments.

- Gas Detection & Spectral Absorption Analysis

When paired with supercontinuum (SC) or superluminescent diode (SLD) broadband sources, the AM7800 enables spectroscopic analysis of gas mixtures by measuring absorption spectra across the near-infrared fingerprint region. This capability supports environmental monitoring, industrial process control, and medical breath analysis applications where specific molecular absorption lines must be identified with high wavelength accuracy. The instrument's ±0.015nm wavelength precision ensures accurate identification of CO2, CH4, H2O, and other gas species, while the high sensitivity captures weak absorption features in low-concentration samples. For research institutions and industrial R&D labs, this transforms the AM7800 from a telecom tool into a versatile scientific instrument for photonics research and sensor development.

Q&A

Q1: What is the difference between the AM7800 and other optical spectrum analyzers in this price range?

The AM7800 distinguishes itself through its combination of 600-1700nm ultra-wide wavelength coverage, -90dBm exceptional sensitivity, and comprehensive built-in analysis functions (EDFA-NF,

WDM, DFB analysis) typically found only in premium instruments. The 10.1-inch capacitive touchscreen and multiple connectivity options (Ethernet, GP-IB, USB 3.0) provide superior usability and automation capabilities for production environments compared to entry-level models.

Q2: Can the AM7800 measure polarization-dependent loss (PDL) in optical components?
While the AM7800 has low polarization dependence (± 0.05dB) for accurate power measurements, it is not a full PDL measurement system. However, by using an external polarization controller and capturing multiple spectra with different polarization states, users can calculate PDL manually. For dedicated PDL testing, we recommend pairing the AM7800 with a polarization analysis accessory or considering specialized PDL measurement equipment.

Q3: How does the EDFA-NF analysis function work, and what standards does it comply with?
The EDFA-NF function uses the ASE interpolation method (IEC 61290-3 compliant) to measure gain and noise figure. The analyzer captures two traces: input spectrum (Trace A) and amplified output spectrum (Trace B). It automatically detects laser peaks, calculates integrated signal power, interpolates ASE noise levels between channels using curve-fitting algorithms, and computes gain and NF values. This automated process eliminates manual calculation errors and provides results consistent with telecom industry standards.

Q4: What maintenance and calibration does the AM7800 require?
The AM7800 features internal wavelength calibration using a built-in reference light source. For optimal performance, we recommend performing optical alignment and wavelength calibration monthly or when moving the instrument between environments. The system prompts users when calibration is needed. Annual factory calibration is recommended for maintaining guaranteed specifications, particularly for wavelength accuracy and power linearity critical in production testing environments.

Q5: Can the AM7800 be integrated into automated test systems?
Yes, the AM7800 supports comprehensive remote control via GP-IB (IEEE 488.2), Ethernet (TCP/IP), and RS-232 interfaces. SCPI command compatibility ensures integration with LabVIEW, Python, MATLAB, and other test automation platforms. The instrument can be programmed to perform sequential measurements, export data to network storage, and generate pass/fail reports without operator intervention — ideal for high-volume manufacturing lines and 24/7 production environments.

Package Contents

Standard Package Contents

1. AM7800 Optical Spectrum Analyzer Main Unit × 1
2. Power Cord (AC 100-240V) × 1
3. USB Mouse × 1
4. USB Keyboard × 1
5. User Manual (English) × 1

6. Programming Guide × 1
7. Calibration Certificate × 1
8. Factory Test Report × 1

Optical Interface Accessories

9. FC/APC Fiber Adapter (Installed) × 2
10. FC/PC Fiber Adapter × 2 (Optional)
11. SC/APC Fiber Adapter × 2 (Optional)
12. LC/APC Fiber Adapter × 2 (Optional)

Interface Cables

13. Ethernet Cable (CAT6, 2m) × 1
14. GPIB Cable (2m) × 1
15. RS-232 Cable (DB9, 2m) × 1
16. HDMI Cable (for external display) × 1

Software & Documentation

17. Instrument Control Software (CD/USB Drive) × 1
18. USB Driver & Documentation × 1
19. Remote Control Command Reference × 1

Packaging Specifications

20. Inner Package: Anti-static foam protection with moisture barrier bag
21. Outer Carton: Double-wall corrugated fiberboard (ISTA 3A certified)
22. Dimensions: 580 × 380 × 550 mm (L×W×H)
23. Gross Weight: 22 kg (including all accessories)
24. Pallet Option: Available for bulk orders (4 units per pallet)

Optional Accessories (Sold Separately)

25. Rack Mount Kit (19-inch, 4U)
26. Additional 128GB SSD Storage Module
27. External Monitor (24-inch, 4K)
28. Fiber Cleaning Kit (NFC-6000)
29. Polarization Controller (PC-300)
30. Tunable Laser Source (TLS-1550)