Agilent N7711A, N7714A Tunable Laser Sources

Data Sheet
Version 2.0

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Agilent Technologies

Introduction

The Agilent N7711A and N7714A tunable lasers are single-port and four-port sources, available with C-band or L-band wavelength coverage. With high output power up to +15 dBm, narrow linewidth of 100 kHz, gridless and grid-defined wavelength setting, and offset fine-tuning capability, the N7711A and N7714A make them ideal sources for realistic loading of the latest transmission systems.

To owners of Agilent's proven Lightwave Measurement System the 81950A tunable laser source module offers the same features as the N7711A. The 81950A plugs into the 8163B and 8164B mainframes. For additional information about the 81950A please refer to the Compact Tunable Laser data sheet, publication no. 5988-8518EN.

Operation Modes

When operated in gridless mode, the wavelength can be set anywhere within its range using the same commands as with other Agilent tunable lasers.

In system loading applications, it may be preferable to grid-tune the lasers like system transmitters, simply by changing the channel index. The channel grid is adjustable to standard ITU-T grid spacing like 50 GHz, and to arbitrary grids. Likewise, the zero frequency (base channel) of the chosen grid is adjustable. A 12 GHz fine-tuning range allows adjustment of the frequency without interrupting the laser output.

Key specifications and features

- Compact instrument format with one or four ports per unit on one-half 19-inch width and one-unit height;
- Flexible configuration of four-port model between C- and L-band channels (N7714A);
- Adjustable to any wavelength grid (ITU-T 100 GHz, 50 GHz, 25 GHz, and arbitrary grids); and gridless tuning;
- Narrow linewidth less than 100 kHz and offset-grid tuning greater than ± 6 GHz ideally suited for coherent mixing applications and new complex modulation formats; and
- Up to +15 dBm output power, with 8 dB power adjustment range.
- Equipped with Panda polarization maintaining fiber.

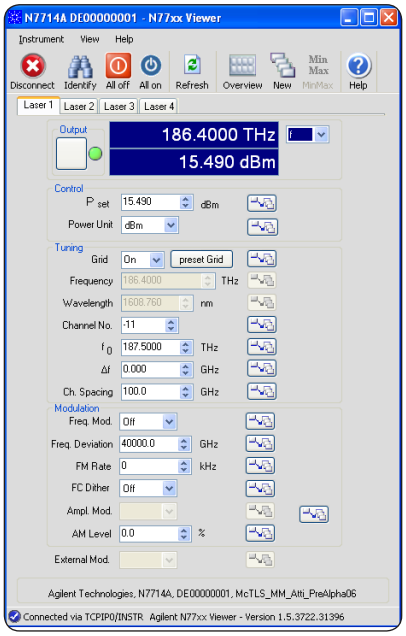

Figure 1. Graphical user interface

The 77-Series Optical Test Instruments

Targeted for high test throughput, lowest cost-per-channel, and narrow footprint, all members of Agilent's 77-Series optical test instruments are built on a common platform and a common PC-based user interface. A complete set of control interfaces including LAN, USB2.0 and GPIB simplifies integration with manufacturing control systems. Code compatible to Agilent's Lightwave Measurement System modules, the new instrument generation can serve as plug-in replacements in existing test solutions.

All 77-series optical test instruments share:

- "just–enough-test" approach with lowest hardware overhead;
- LAN, USB and GPIB interfaces;
- Built-in international power supply;
- SCPI command set, compatible with existing instrument categories for easy drop-in replacement; and
- Agilent IO libraries and a PC-based graphical user interface.

The N77-Viewer: An easy-to-use graphical user interface

The N77's Window's based graphical user interface offers flexible and extensive control of the instrument.

- Easy switching between channels with tabs.
- Overview window with all channels at a glance.
- Two instrument configurations can be stored and recalled.
- Turn on and off the laser output with one click.
- Choose between setting a laser's wavelength, frequency, channel or its output power.

Technical specifications

Specifications apply to wavelengths on the 50 GHz ITU-T grid, after 1 hour warm-up, in non-condensing conditions, in CW operation.

Parameter	Agilent N7711A, N7714A	
Wavelength	**Options #210, #222, #240**	**Options #201, #222, #204**
Wavelength (frequency) range	1527.60 nm to 1565.50 nm (196.25 THz to 191.50 THz)	1570.01 nm to 1608.76 nm (190.95 THz to 186.35 THz)
Frequency (wavelength) resolution	100 MHz (0.8 pm at 1550 nm)	
Fine tuning range	Typical ± 6 GHz	
Fine tuning resolution	Typical 1 MHz	
Absolute wavelength (frequency) accuracy	± 22 pm (± 2.5 GHz)	
Relative wavelength (frequency) accuracy	± 12 pm (± 1.5 GHz)	
Wavelength (frequency) repeatability	Typical ± 2.5 pm (± 0.3 GHz) [2]	
Wavelength (frequency) stability	Typical ± 2.5 pm (± 0.3 GHz), 24 hours [2]	
	Typical ± 0.5 pm, 1 minute [2]	
Tuning time	Typical < 30 sec [3]	
Optical power		
Max. output power	≥ +13.5 dBm	
	Typical ≥ +15 dBm	
Power stability	Typical ± 0.03 dB over 24 hours [2]	
	Typical ± 0.03 dB over 1 hour [2]	
Power flatness	Typical ± 0.2 dB (full wavelength range)	
Power repeatability	Typical ± 0.08 dB [2]	
Spectral		
Linewidth	Typical < 100 kHz (SBS suppression off)	
Side mode suppression ratio (SMSR)	Typical 50 dB	
Source spontaneous emission (SSE)	Typical 50 dB/ 1 nm [1]	
	Typical 60 dB/ 0.1 nm [1]	
Relative intensity noise (RIN)	Typical –145 dB/Hz [1] (10 MHz to 40 GHz)	

1. *At maximum specified output power, as specified per wavelength range*
2. *At constant temperature ± 0.5 K*
3. *Including power stabilization*

Supplementary Performance Characteristics, Non-warranted

Parameter	Agilent N7711A, N7714A
Grid spacing	100 GHz, 50 GHz, 25 GHz, or arbitrary grid
Fine tuning speed	15 sec from -6 GHz to +6 GHz
Warm-up time	1 hour, immediate operation after boot-up
Output power	
Power attenuation range	8 dB
Power setting resolution	0.1 dB
Residual output power (shutter closed)	≤ –45 dBm
Stimulated Brillouin scattering suppression	
SBS suppression FM p-p modulation range	0 GHz to 1 GHz
SBS suppression dither frequency	20.8 kHz

General Characteristics

Parameter	Agilent N7711A, N7714A
Connectivity	FC/APC angled (option #072) or FC/PC straight (option #071) connector interface
Fiber type	9/125 µm panda PMF, TE mode in slow axis, in line with connector key
Polarization extinction ratio	16 dB typical
Output isolation	30 dB typical
Laser safety	Class 1M
Recommended recalibration period	24 months
Operating conditions	+10 °C to +35 °C
	< 80% relative humidity, non-condensing
Altitude	Max 2000 m
Pollution protection	Designed for pollution detection degree 2
Storage conditions	–40 °C to +70 °C
	< 80% relative humidity, non-condensing
Form factor	One rack unit, ½ 19" width
Dimensions (H x W x D)	43 mm x 212 mm x 372 mm
Weight	3.8 kg (6 lbs)
Front panel	Status LEDs, laser on/off buttons, line power on/off switch
Connectivity, rear panel	USB 2.0, LAN 10/100 Mbit/s, GPIB
User interface	PC user interface application, SCPI commands, Agilent IO libraries
Power consumption	AC 100-240 V ±10%, 50 Hz/60 Hz, 60 VA maximum
Laser safety information INVISIBLE LASER RADIATION DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS CLASS 1M LASER PRODUCT (IEC 60825-1:2007)	All laser sources specified by this data sheet are classified as Class 1M according to IEC 60825-1 (2007). All laser sources comply with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated 2007, June 24.

Ordering Information

All systems have 1 year warranty

Model number	
N7711A	Tunable laser source, 1 port
N7714A	Tunable laser source, 4 ports
Connector interface option	
-071	Straight connector interface, PMF
-072	Angled connector interface, PMF
Wavelength (frequency) option	
N7711A	
-210	C-band laser
-201	L-band laser
N7714A	
-240	4 C-band lasers
-204	4 L-band lasers
-222	2 C-band lasers and 2 L-band lasers
Accessories	
N7744-100	Rack mount kit for 1 or 2 units
Warranty	
Select coverage	
Included	3-year warranty (return to Agilent), standard
R-51B-001-5Z	5-year warranty assurance plan (return to Agilent): Priority warranty service includes one-time coverage for an EOS/ESD failure
Calibration	
Select Agilent calibration plan	
R-50C-011-3	3-year calibration assurance plan (return to Agilent): Priority calibration service covering all calibration costs for 3 years; 15% cheaper than buying stand-alone calibrations.
R-50C-011-5	5-year calibration assurance plan (return to Agilent): Priority calibration service covering all calibration costs for 5 years; 20% cheaper than buying stand-alone calibrations.

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Other AP Countries	(65) 375 8100

Europe & Middle East

Belgium	32 (0) 2 404 93 40
Denmark	45 45 80 12 15
Finland	358 (0) 10 855 2100
France	0825 010 700*
	*0.125 €/minute
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Ireland	1890 924 204
Israel	972-3-9288-504/544
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