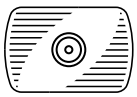


Wavelength Meter

WS7-30 Series

HighFinesse
The Standard of Accuracy

Ångstrom

Available Measurement Ranges

WS7-30 Standard (VIS)	330 – 1180 nm
WS7-30 UV-I	248 – 1180 nm
WS7-30 IR-I	630 – 1750 nm
WS7-30 IR-II	1000 – 2250 nm [1)]

Absolute (and Other) Accuracies [2)]

192 – 330 nm (with multi mode fiber)	0.1 pm
330 – 375 nm	50 MHz
375 – 800 nm	30 MHz
800 – 1180 nm	25 MHz
1180 – 2250 nm	20 MHz
Quick coupling accuracy (with 50 µm multi mode fiber)	100 MHz
Wavelength deviation sensitivity/Measurement resolution [3)]	1 MHz
Linewidth estimation accuracy [4) 5)]	200 MHz

Measurement Speed

500 Hz

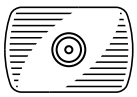
1) Photonic Crystal Switches can be used up to 2000 nm. Please contact HighFinesse if you want to measure over 2000 nm.

2) According to 3σ criterion, but never better than 20 % of the laser linewidth.

3) Standard deviation. WS7-30 requires photonic crystal (endlessly singlemode) fibers to reach this resolution.

4) Not better than 20 % of the linewidth.

5) Each instrument in each mode can measure lasers with a linewidth up to 30 % of the correspondig FSR.



Wavelength Meter

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Required Minimum Input Energy and Power [6)]

Standard (VIS)	0.08 – 60 µJ or µW
UV-I	0.08 – 40 µJ or µW
IR-I	8 – 800 µJ or µW
IR-II [7)]	8 – 800 µJ or µW

FSR of the Fizeau Interferometers (Fine/Wide Mode)

4 GHz/32 GHz [5)]

Calibration

Stabilized HeNe laser, SLR-1532, or any other well known laser source Δv < 5 MHz

Recommended calibration period ≤ 10 hour

Warm-up Time

> 30 min. warm-up, or until ambient equilibrium

Dimensions L × W × H

360 × 200 × 120 mm

Weight

6.1 kg

Interface

High-speed USB 2.0 connection

5) Each instrument in each mode can measure lasers with a linewidth up to 30 % of the correspondig FSR.

6) The CW power interpretation in [µW] compares to an exposure of 1 s (generally the energy needs to be divided by the exposure time to obtain the required power).

7) µJ interpretation for pulsed lasers. CW signals need more power in [µW] since the exposure is limited at IR-II instruments.

Power Supply

Power consumption < 2.3 W, power provided directly via USB cable
WS7-30 IR-I and WS7-30 IR-II: external power supply included

Options

External Trigger (TTL)

All wavelength meters detect and measure pulsed signals automatically. Additionally, this option allows the user to trigger pulsed measurements externally. The TTL option guarantees synchronization between pulsed excitation and measurement. It provides low-noise signals without parasitic parts when measuring pulsed signals with low duty cycles.

Please note, if the option MC is ordered together with the TTL option, the TTL mode can only be used if the switch is set fixed to one input channel.

Laser Control (PID)

With the PID option it is possible to stabilize the frequency of a laser connected to the wavelength meter using a software based proportional-integral-derivative controller (PID controller). Unlike analog PID electronics, the PID option provides software based signal processing, allowing the laser to be stabilized to a specific user defined frequency or regulated with an arbitrary pattern.

This makes it extremely useful in experiments where the laser frequency has to be actively regulated or varied to fit changing experimental conditions, such as laser cooling, atomic detection, trapping and spectroscopy.

Combined with the MC option the wavelength meter can be used to stabilize multiple lasers simultaneously. The regulation speed, quality and absolute accuracy match the measurement speed, relative accuracy and absolute accuracy of the wavelength meter respectively. The measurement speed is not affected by the regulation.

Photonic Crystal Multichannel Switch (MC)

In order to measure the frequencies of more than just one laser at a time, an opto-mechanical switch is used. The combination of our high-speed wavelength meters with one of the quickest fiber switches available allows up to eight channels to be measured almost simultaneously. Exposure time and other parameters can be defined independently for each light source.

The WS7-30 series features the use of an endlessly singlemode switch based on photonic crystal technology. This allows to measure any laser wavelength on all switch input channels within all measurement ranges of the WS7-30.

Please note, if the option MC is ordered together with the TTL option, the TTL mode can only be used if the switch is set fixed to one input channel.

Linewidth Estimation (L)

The linewidth estimation of a singlemode laser source is performed by a special algorithm which eliminates the interferometer's instrument response function. The algorithm enables the estimation of the linewidth with an accuracy better than the tenth of the instrument FSR.

The linewidth option can also be used for measuring the linewidth of multimode lasers or lasers with sidebands. In this case, the longitudinal mode splitting needs to be less than the instruments spectral resolution and the calculated result is the FWHM of the envelope function of the multiline spectrum. Any instrument can be upgraded with the L-option.

Singlemode fibers are required.

Options

External Calibration (CAL)

Standard HighFinesse wavelength meters up to an absolute accuracy of 60 MHz feature autocalibration via an integrated calibration source. This guarantees the accuracy and stability of measurements with our wavelength meters. For the higher accuracies we offer a variety of frequency stabilized, narrow linewidth, laser sources with up to ± 10 kHz frequency stability for different applications.

For further information see our product description here: **https://www.highfinesse.de/cal**

Typical Applications

The WS7-30 is a high-end solution for wavelength monitoring and control with an absolute accuracy of 30 MHz and a wavelength deviation sensitivity down to 1 MHz.

It perfectly combines with the singlemode multichannel option for selected wavelength intervals or the photonic crystal fiber technology enabling multichannel operation in the spectral range of the wavelength meter.

The specified absolute accuracy is reached, when the instrument is calibrated with one of our recommended calibration sources (or other suitable stabilized lasers with equivalent absolute accuracy or better).

Further Information

For further technical information, application examples, diagrams and for customization of the WS7-30 series please contact:

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