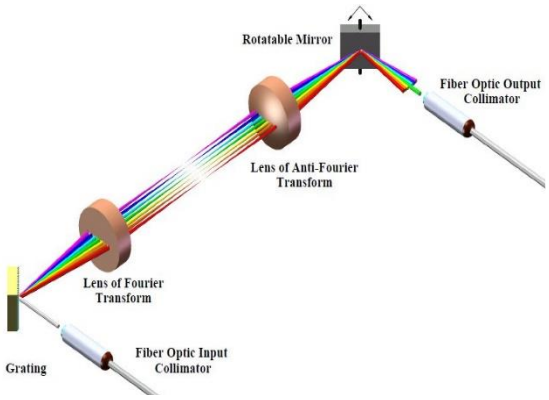
Gaussian-Shape Tunable Optical Filter over 780-1000nm

Gaussian-shape Tunable Optical Filter of WLTF-NM (or -NE) -series is built based on free-space optics combing with diffraction grating to producea band-pass transmission. It is a 2-port fiber-pigtailed device. Whena wide-band spectrum is injected to the input port, the tunable filter will select a narrow section for output and reject the rest band of spectrum. The center wavelength of the selected band is tunable over a range by either a precise micrometer driver oran electric actuator.

Patent-pending optics design offers a great option of bandwidths and tuning rangeswith unprecedented low insertion lossand polarization dependent loss (PDL) in the market.Precise tuning mechanism enables filters to provide high wavelength resolution and excellent wavelength-tuning repeatability.Both of manual and electric version filters are available over NIR band of 780-1000nm.



Operating Principle and TuningMechanism

Manual Version of WLTF-NM-P-

Electric Version of WLTF-NE-P-

Key Features

- Up to 120nm wavelength tuning range
- Down to 0.07nm FWHM bandwidth
- Unprecedented low insertion loss and PDL
- High optical power handling
- Accurate and uniform bandwidth over whole tuning range
- High out-band suppression

Applications

- ASE noise suppression
- Quantum optics
- WDM wavelength tuning
- Pulse shaping
- FBG sensor interrogation
- Tunable fiber lasers

Contact: sales@wlphotonics.com
300 Terry Fox Drive, Suite 600, Kanata, Ontario, K2K 0E3, Canada. Tel: +1 613-801-1825.

Specifications of Manual Tunable Optical Filter of WLTF-NM-P-

Central Wavelength	810nm, 880nm, 940nm or as per specified within 810-960nm
Tuning Range	60nm or 120nm
Insertion Loss	2.5dB typ. and 3.5dB max. (connector exclusive)
FWHM Bandwidth	1.00nm, 0.90nm, 0.80nm, 0.70nm, 0.60nm, 0.50nm, 0.40nm, 0.30nm, 0.25nm, 0.20nm, 0.15nm, 0.10nm, 0.07nm or as per specified.
Wavelength Resolution	0.02nm
Wavelength Repeatability	±0.02nm
Polarization-Dependent Loss	0.15dB typ./0.30dB max. (SM fibre pigtail only)
Extinction Ratio	20dB (Connector exclusive, PM fibre pigtail only)[2]
Out-Band Suppression	>45dB (Transmission peak to the average of background)
Bandwidth Ratio of 3/20/30dB	~1/2.5/3.5
Optical Power Handling[1]	300mW (CW)[1]
Return Loss	>45dB
Polarization Mode Dispersion	<0.2ps (SM fiber pigtail only)
Group Delay	<0.1ps/nm
Pigtail Fibre Type	SM fiber or PM fibre
	Such as Nufern's 780HP or Panda PM 850, or specified others
Operating Temp	10°C to 50°C
Storage Temp	-10°C to 75°C
Dimension	See drawings below
Weight	<0.5kg typical
Other	RoHS compliant
Notes	[1] High power version of up to 2.0W (CW) is available on request.
	[2] PM fibres aligned in PM slow axes (fast-axis blocking) as standard, otherwise as per the specified.

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Specifications of Electric Tunable Optical Filter of WLTF-NE-S or P-

Central Wavelength	810nm, 880nm, 940nm or as per specified within 810-960nm	
Tuning Range	S-version	P-version
	60nm	120nm
Insertion Loss	2.5dB typ. and 3.5dB max. (connector exclusive)	
FWHM Bandwidth	1.00nm, 0.90nm, 0.80nm, 0.70nm, 0.60nm, 0.50nm, 0.40nm, 0.30nm, 0.25nm, 0.20nm, 0.15nm, 0.10nm, 0.07nm or as per specified	
Wavelength Resolution	S-version	P-version
	0.01nm	0.001nm
Wavelength Repeatability	S-version	P-version
	+/-0.01nm	+/-0.005nm
Max. Tuning Speed	40nm/Sec.	
Polarization-Dependent Loss	0.15dB typ. and 0.30dB max. (SM fibre pigtail only)	
Extinction Ratio	20dB (Connector exclusive, PM fibre pigtail only)	
Bandwidth Ratio of 3/20/30dB	~1/2.5/3.5	
Max. Optical Power[1]	300mW (CW). Up to 2.0W (CW) power handling available on request	
Return Loss	>45dB	
Out-Band Suppression	>45dB (Transmission peak to the average of background)	
Polarization Mode Dispersion	<0.2ps (SM fibre pigtail only)	
Group Delay	<0.1ps/nm	
Pigtail Fibre Type[2]	SM fiber or PM fibre	
	Such as Nufern's 780HP, Panda PM 850 or specified others.	
Electric Interface	USB	
Operating Temp	10°C to 50°C	
Storage Temp	-10°C to 75°C	
Dimension	See drawings below	
Weight	<0.5kg	
Other	RoHS compliant	
Notes	[1] High power version of up to 2.0W (CW) is available on request.	
	[2] PM fibres aligned in PM slow axes (fast-axis blocking) as standard, otherwise as per the specified.	

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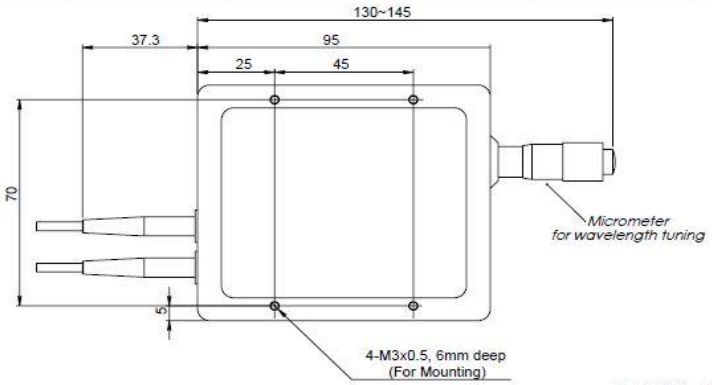
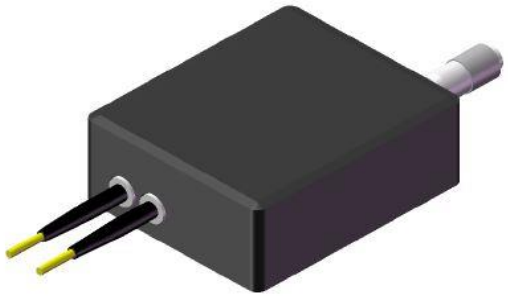
Dimensions of Manual Tunable Filter (WLTF-NM-P-version)





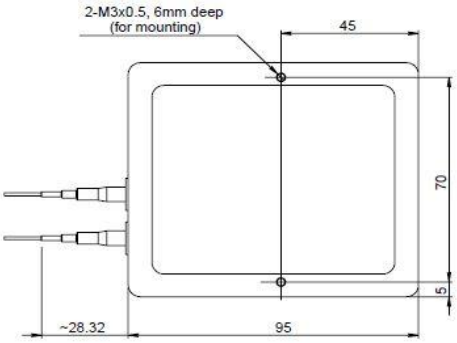
Typical Specifications:

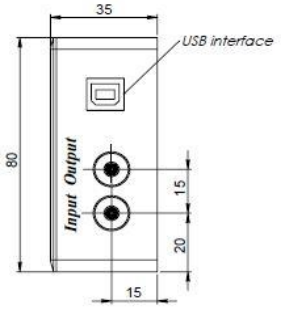
1. *Manual Tunable Optical Filter of P-Version with Fiber Pigtail over 780-1000nm.*
2. *Down to 0.07nm FWHM (Gaussian-shape) Bandwidth.*
3. *Up to 120nm Tuning Range.*
4. *2.5dB typ. and 3.0dB max. Insertion Loss over Tuning Range.*
5. *0.15dB typ. and 0.30dB max. PDL (SM fiber pigtail only).*
6. *>20dB ER (PM fiber pigtail only)*
7. *>45dB Off-Band Rejection*
8. *>45dB Return Loss.*
9. *300mW (CW) max. Optical Input Power. Up to 2.0W (CW) Optical Power Handling Available on Request.*

WL Photonics Inc. reserves the right to change dimensions without notice.

WL Photonics Inc.		TITLE: Dimensions of WLTF-NM-P-NIR Version Tunable Optical Filter		
	Date	SIZE A	DWG. NO. DS-013	REV 1
	Feb.15/2020	SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

Dimensions of Electric Tunable Filter of WLTF-NE-S-version with USB interface)





Typical Specifications:

1. *Electrically Tunable Optical Filter of S-Version over 780-1000nm.*
2. *Down to 0.07nm FWHM (Gaussian-shape) Bandwidth.*
3. *Up to 60nm Tuning Range.*
4. *2.5dB typ. and 3.5dB max. Insertion Loss over Tuning Range.*
5. *0.15dB typ. and 0.30dB max. PDL (SM fiber pigtail only).*
6. *>20dB ER (PM fiber pigtail only).*
7. *>45dB Off-Band Rejection*
8. *>45dB Return Loss.*
9. *300mW (CW) max. Optical Input Power. Up to 2.0 W (CW) Optical Power Handling Available on Request.*
10. *0.01nm Wavelength Resolution and +/-0.01nm Wavelength Repeatability*
11. *USB, SPI, or I2C Interface. Other Interfaces Available on Request.*

WL Photonics Inc. reserves the right to change dimensions without notice.

WL Photonics Inc.		TITLE: Dimensions of WLTF-NE-S-NIR Version Tunable Optical Filter		
	Date	SIZE A	DWG. NO. DS-014	REV 1
	Feb. 15/2020	SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

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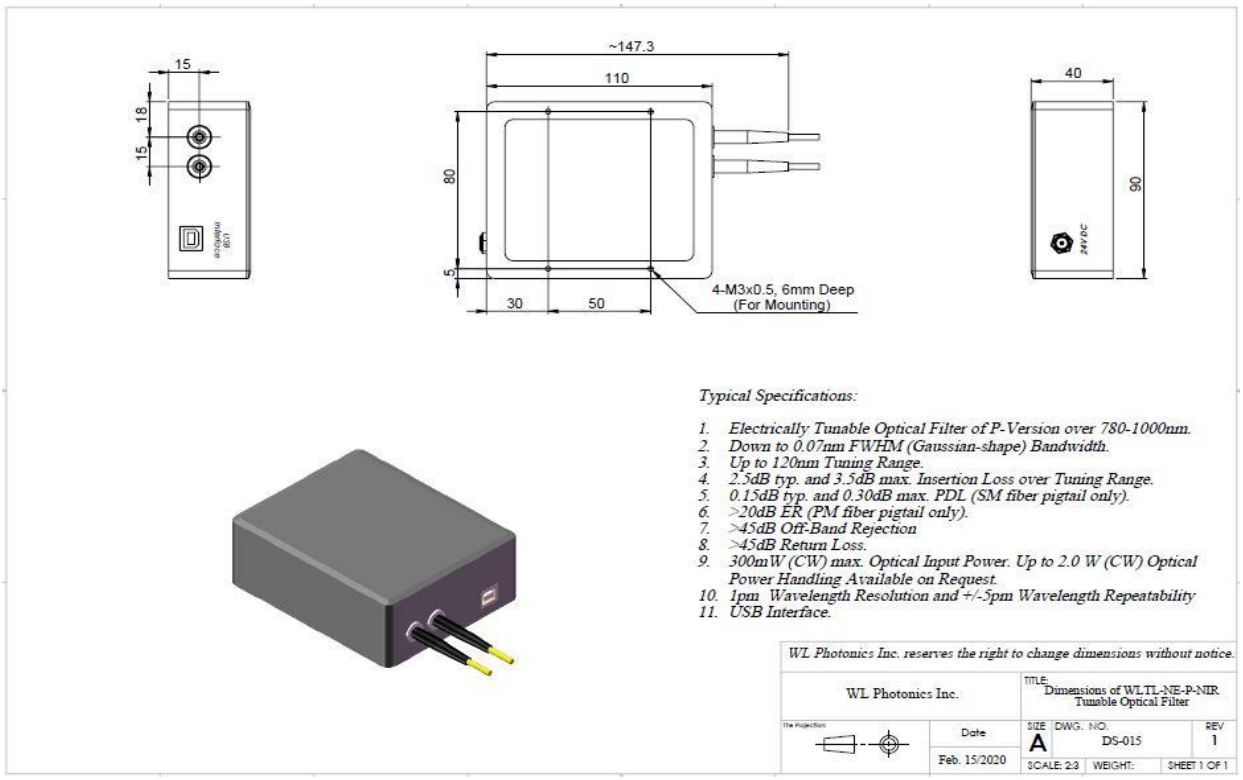
Dimensions of Electric Tunable Filter of WLTF-NE-P-version with USB interface)



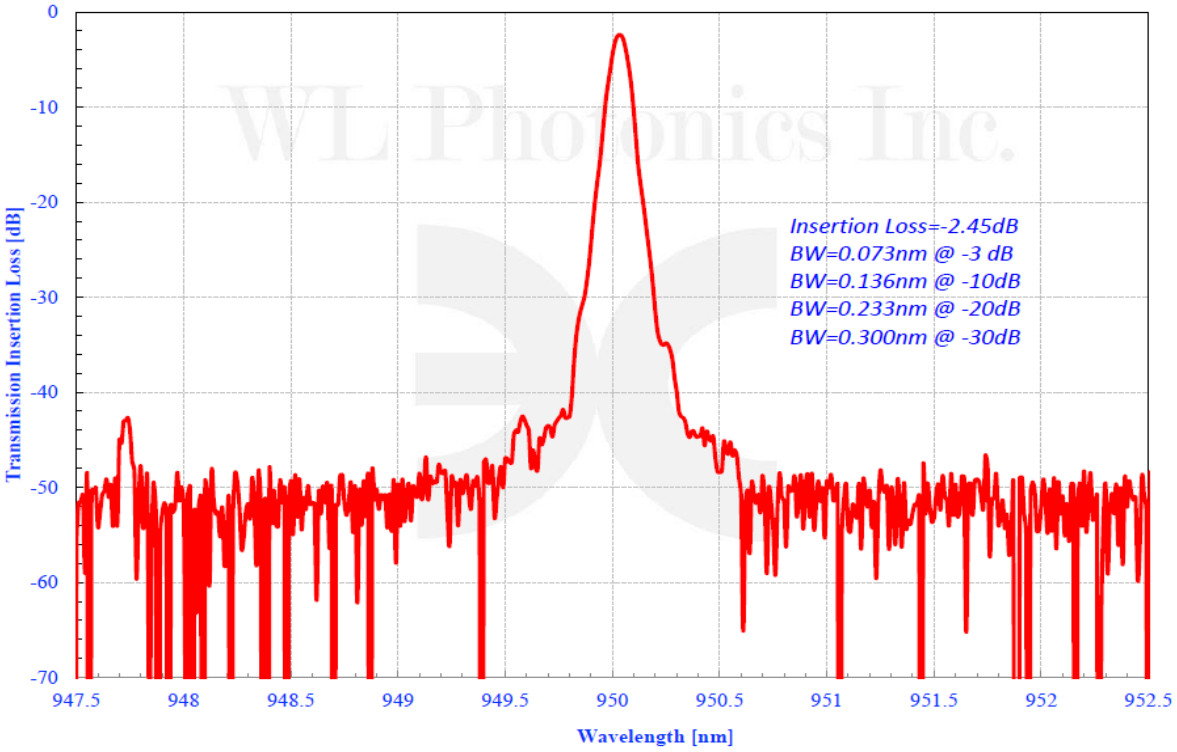
Typical Specifications:

1. *Electrically Tunable Optical Filter of P-Version over 780-1000nm.*
2. *Down to 0.07nm FWHM (Gaussian-shape) Bandwidth.*
3. *Up to 120nm Tuning Range.*
4. *2.5dB typ. and 3.5dB max. Insertion Loss over Tuning Range.*
5. *0.15dB typ. and 0.30dB max. PDL (SM fiber pigtail only).*
6. *>20dB ER (PM fiber pigtail only).*
7. *>45dB Off-Band Rejection*
8. *>45dB Return Loss.*
9. *300mW (CW) max. Optical Input Power. Up to 2.0 W (CW) Optical Power Handling Available on Request.*
10. *1pm Wavelength Resolution and +/-5pm Wavelength Repeatability*
11. *USB Interface.*

WL Photonics Inc. reserves the right to change dimensions without notice.

WL Photonics Inc.		TITLE: Dimensions of WLTL-NE-P-NIR Tunable Optical Filter	
	Date: Feb. 15/2020	SIZE: A	DWG. NO.: DS-015 / REV: 1
		SCALE: 2:3	WEIGHT: / SHEET 1 OF 1

Example: Typical Transmission Spectra of 0.07nm Tunable Filter Centred at 950nm



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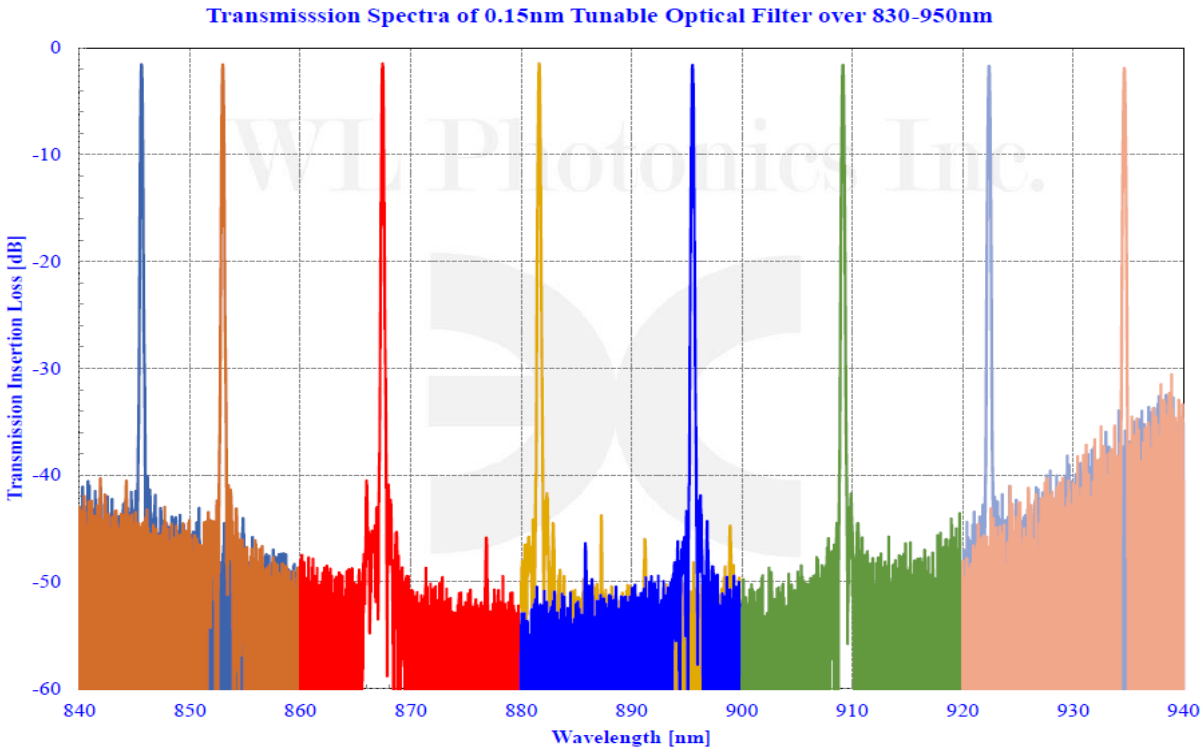
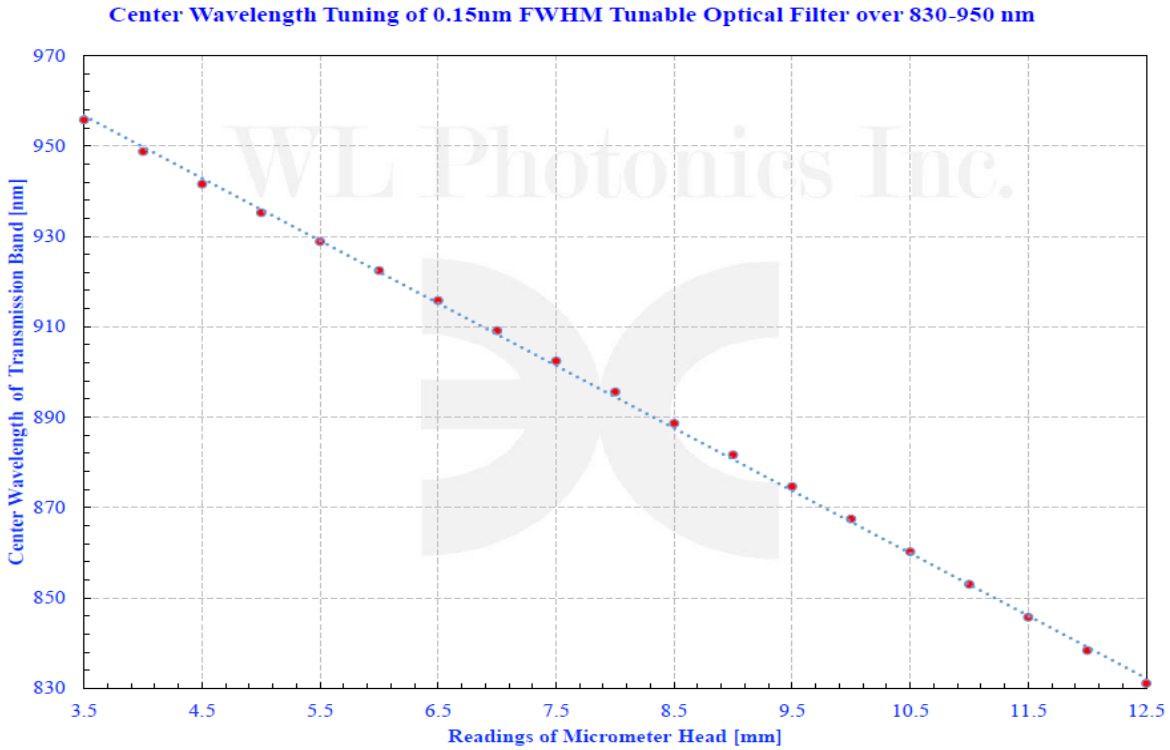
Example: Typical Spectra & Tuning Feature of 0.15nm FWHM Tunable Filter over 830-950nm





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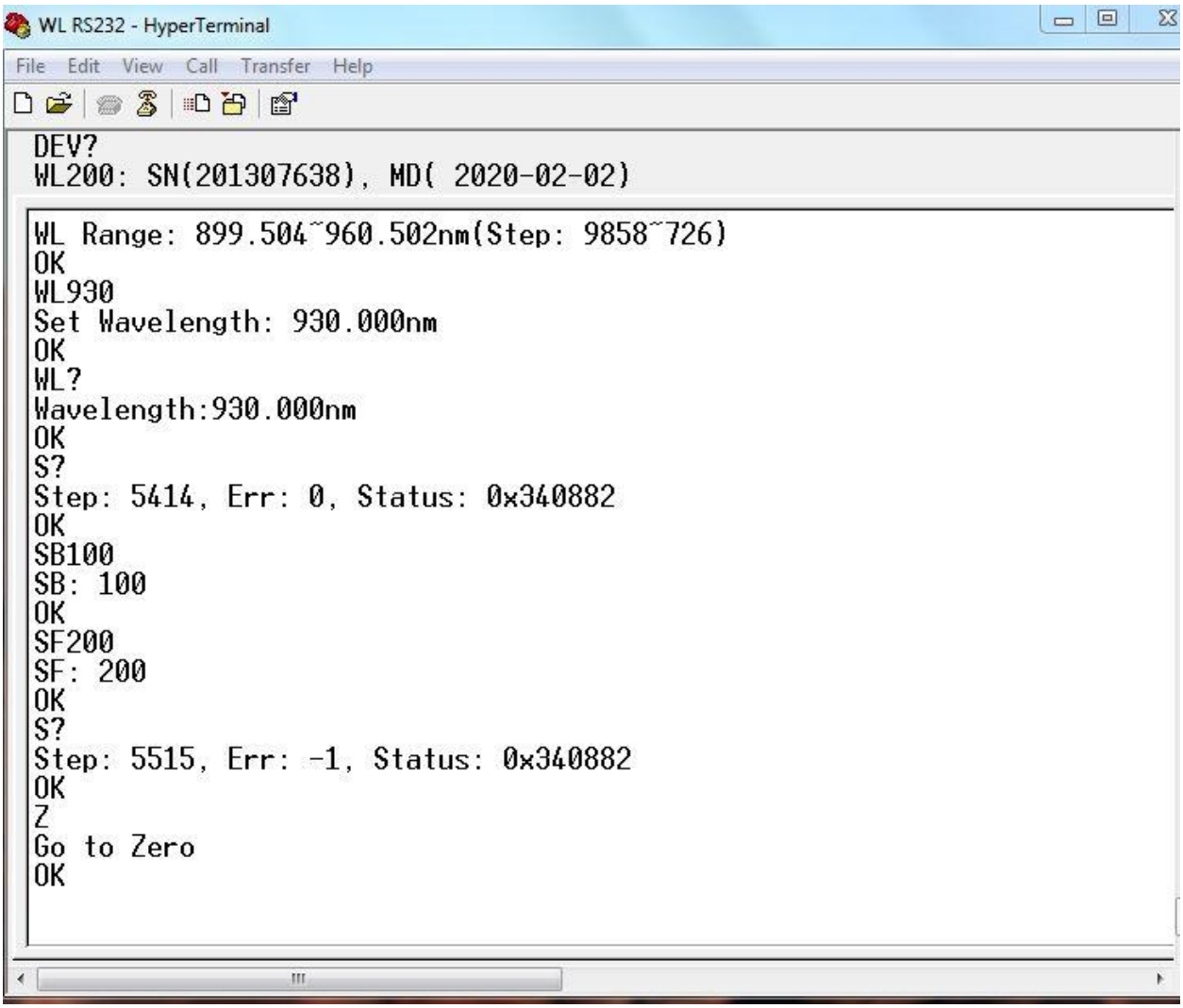
USB interfaceof S-version electric tunable filters for Filter Wavelength Tuning (FWT) through a PC is equipped with USB-RS232 virtual serial port interface (USB B-type connector). The power supply is provided from either USB directly or an extra 5V DC (on request). It is easy to use any Serial COM Port Software in PC to control FWT, such as HyperTerminal and Tera Term. The command set is very simple and easy to drive the filter to find the home position, go to desirable center wavelengths of transmission band or any indicated positions within actuation range.

Example: LWT control interface of WLTL-200 version.



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Ordering Information

Part Number of Manual Version: WLTF-NM-P-B-C/D-E-F/G-H

Part Number of Electric Version: WLTF-NE-A-B-C/D-E-F/G-H-I

A. Electric version type: P is P-version; S is for S-version.
B. Central wavelength of tuning range in nanometer: 890 is for centering tuning range at 890nm.
C. Tuning range in nanometer: 60 is for 60nm tuning range and 120 is for 120nm tuning wavelength range.
D. FWHM bandwidth in nanometer: 0.15is for 0.15nm FWHM bandwidth.
E. Fibre type:SM for single mode fiber and PM for Panda polarization maintaining fibre.
F. Pigtail cable diameter in millimeter: 0.25 is for 250μm OD buffer fibre, 0.9 is for 900μm OD loose tube and 3.0 is for 3.0mm OD cable.
G. Pigtail length in meter: 0.5 is for 0.5m long and 1.0 is for 1M long.
H. Connector type on pigtail termination: such as FC/APC, FC/UPC, SC/APC and 00 is for no connector.
I. Interface type of electric version filters: USB is for USB interface, I^2C is for I^2C interfaceand SPI is for SPI interface.

Example 1: **WLTF-NM-P-940-120/0.25-SM-3.0/1.0-FC/APC**
Description: P-version fibre optic polarization-insensitive manually tunable optical filter of 0.25nm FWHM (Gaussian-shape) bandwidth over 880-1000nm tuning range centred at 940nm with 1M long, 3.0mm OD loose cabled Nufern's 780HPfibre pigtails and FC/APC connectors onpigtail ends. 300mW (CW) max. input optical power.

Example 2: **WLTF-NM-P-850-60/0.50-SM-3.0/0.5-FC/APC-2.0**
Description: P-version fibre optic polarization-insensitive manually tunable optical filter of 0.50nm FWHM (Gaussian-shape) bandwidth over 820-880nm tuning rangecentred at 850nm with 0.5M long, 3.0mm OD loose cabled Nufern's 780HPfibre pigtails and FC/APC connectors on pigtail ends. 2.0W (CW) max. input optical power.

Example 3: **WLTF-NE-S-840-60/0.07-PM-0.9/1.0-FC/APC-USB**
Description: S-version fibre optic polarization-insensitive electrically tunable optical filter of 0.07nm FWHM (Gaussian-shape) bandwidth over 810-870nm centred at 840nm with 1M long, 0.9mm OD loose cabled Panda PM 850 fibre pigtails aligned in PM slow axes (fast -axis blocking) and FC/APC connectors on pigtail ends. 300mW (CW) max. optical input power and USB interface.

Example 5: **WLTF-NE-P-890-120/0.15-SM-3.0/0.75-FC/APC-USB**
Description: P-version fibre optic polarization-sensitive electrically tunable optical filter of 0.15nm FWHM (Gaussian-shape) bandwidth over 830-950nm centred at 890nm with 0.5M long, 3.0mm OD loose cabled Nufern's 780HPfibre pigtails and FC/APC connectors on pigtail ends. 300mW (CW) max. optical input power and USB interface.

Customization

Besides the specifications above, other customizationssuch as flat-top transmission spectra, both bandwidth and center wavelength tunable independently are available. Please ask our sales for solutions.

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