Give you a feel®

When every point of the optical fiber is a sensor

Neural Optical Fiber Scope

NEUBRESCOPE *NBX-6066 / NBX-6166*

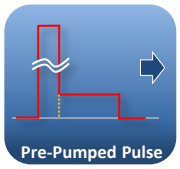
The Brillouin Backscattering Analyzer with patented Pulse-Pre-Pump technology with long distance measuring capability for Strain and/or Temperature measurement.

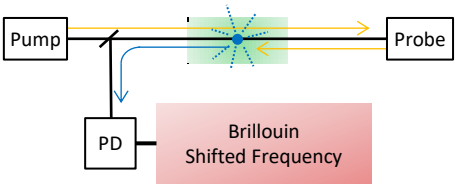
- **Built-in operation controller and data analyzer**
- Long measurement distance range up to **80km** (NBX-6166)
- Best Spatial Resolution: **10cm**
- Best Repeatability: **0.15°C / 3με** (NBX-6066 PPP-BOTDA)
- **High Speed** measurement up to **550 times/sec**

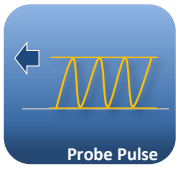
NEUBREX®

The Principle

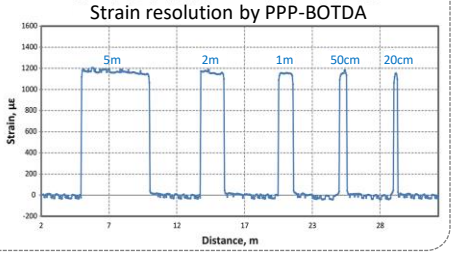
PPP-BOTDA



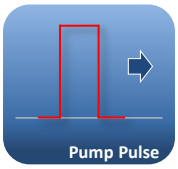


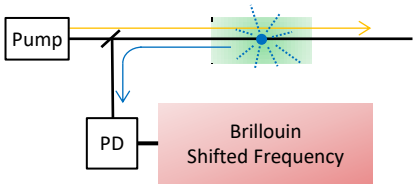


Strain resolution by PPP-BOTDA

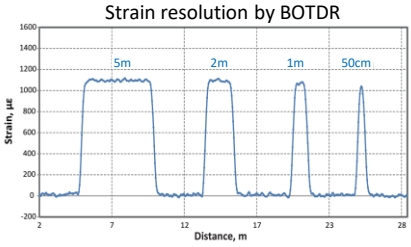


BOTDR

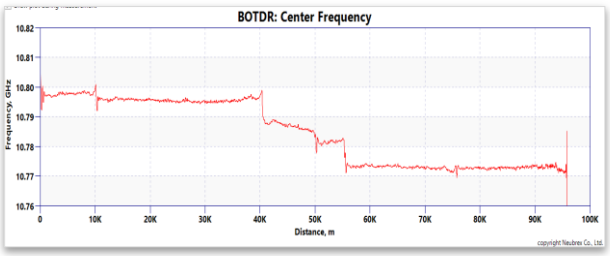




Strain resolution by BOTDR



Long Distance Measurement (NBX-6166)



The NEUBRESCOPE NBX-6166 is capable for long distance measurement in the function of BOTDR and COTDR.

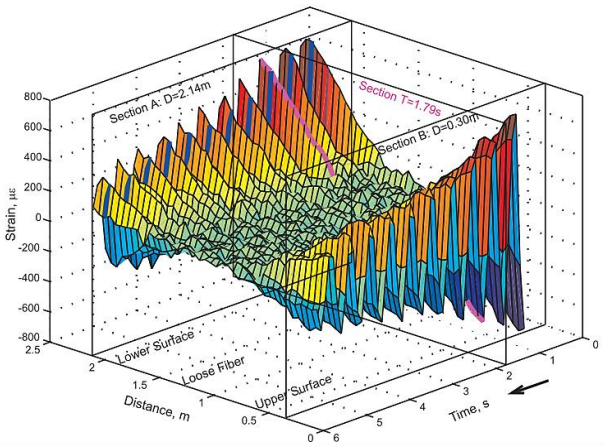
The test configuration is set by several fibers that attached together as the simulation of real fiber path. In the maximum pulse width 1000ns with suitable optical output power, the measurement range can be up to 80km.

High Speed Measurement

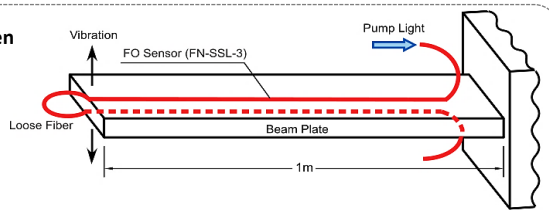
The NEUBRESCOPE NBX-6066 and NBX-6166 offers high speed measurement:

- Frequency Scanning (FS) Mode.
- Amplitude Transfer (AT) Mode.

The measurement speed can be up to 550 times per second (AT Mode) that can fulfill most requirements of vibration tests.



Test Specimen



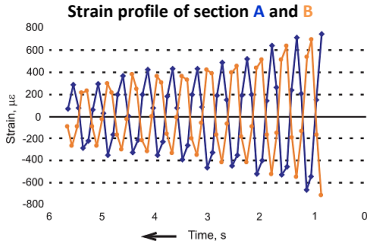
Test conditions

- Spatial resolution: 10m
- Sampling rate: 5cm
- Measured range: ±1500με
- Averaging counts: 2^8

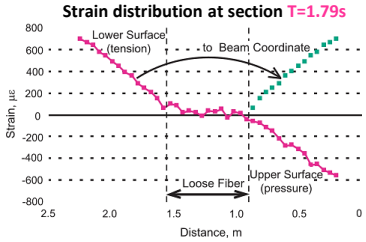
Conditions of Measurement Speed

Range (m)	50	100	500
Repeatability (με)	50	50	50
Speed (sec)	0.089	0.11	0.25

Strain profile of section A and B



Strain distribution at section T=1.79s



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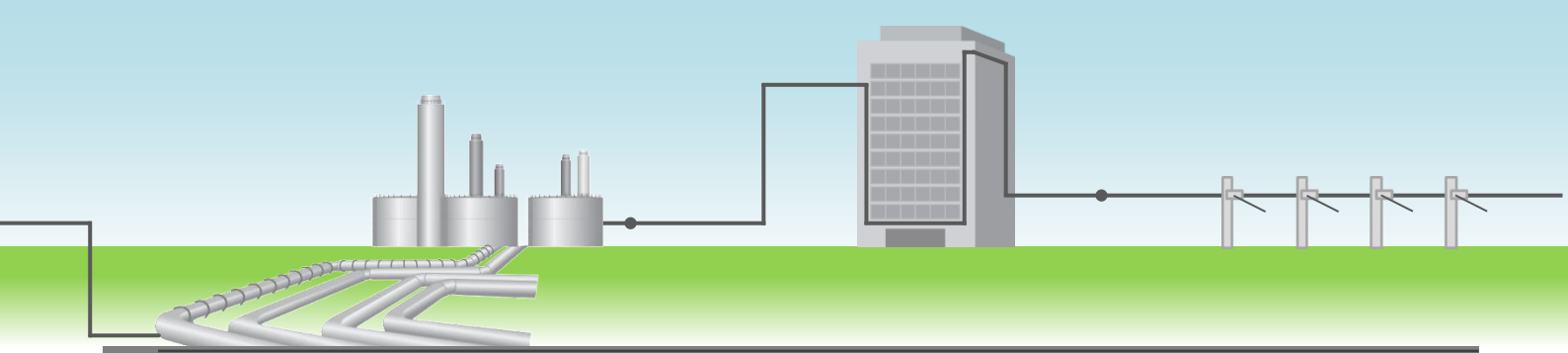
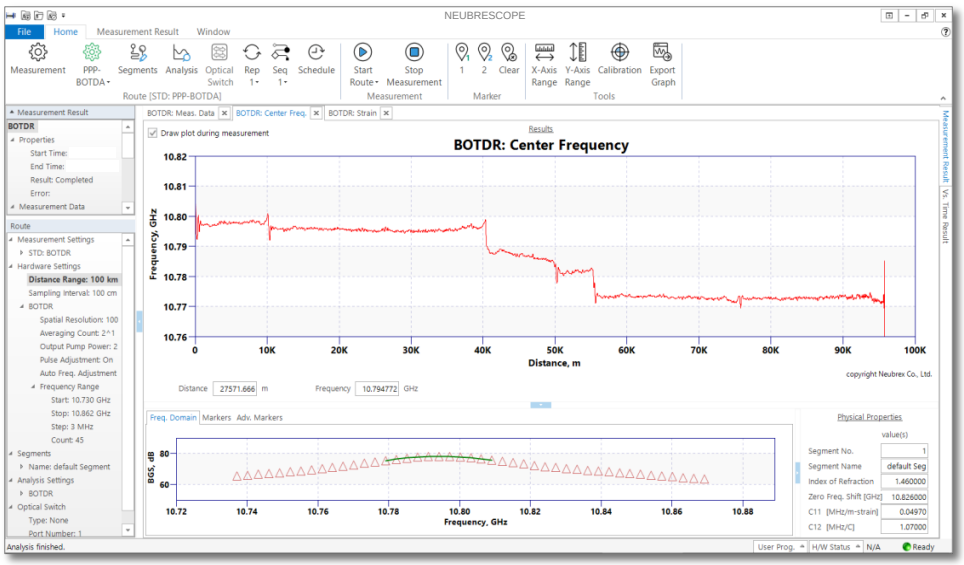
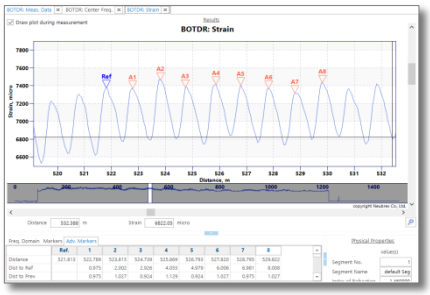


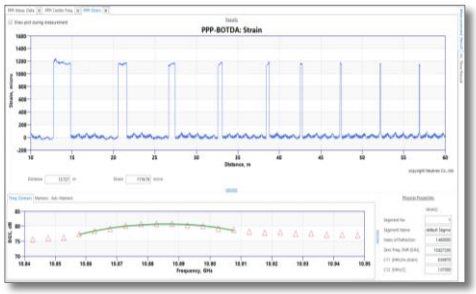
Software and Operation User Interface

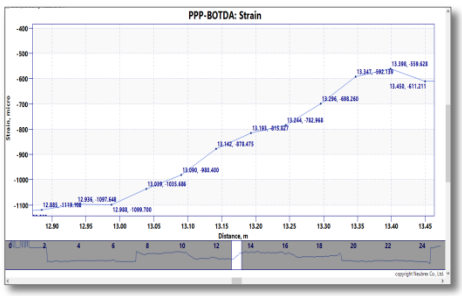
The NEUBRESCOPE software features redesigned User Interface, considerably improving user experience and productivity. The instrument is fully controlled via software by its Ethernet port. Moreover, software open-architecture allows one to extend this list and add support for any other format.

- Strain / Temperature waveform along with length of fiber.
- Gain of Frequency Shift.
- Comparison in between of multiple given measured data.
- Advanced Marker for cross reference easily and quickly.





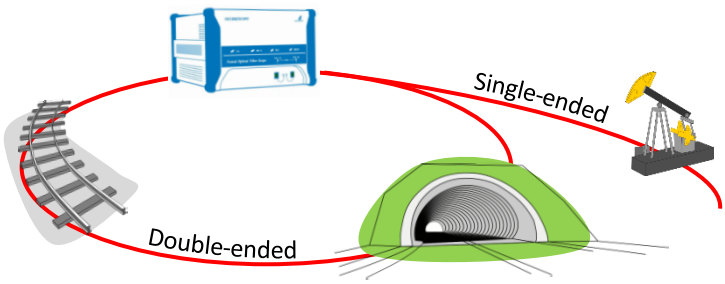




Configurations & Applications

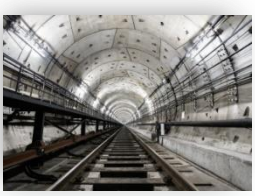
PPP-BOTDA

- Double-ended (Loop) fiber access.
- High resolution.
- Good accuracy and repeatability.
- Frequency Sweep (FS) and Amplitude Transfer (AT) mode available for dynamic stain sensing.



BOTDR

- Single-ended fiber access.
- Good accuracy for Strain or Temperature.
- Amplitude Transfer (AT) Mode available for dynamic strain sensing.



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Specifications NBX-6066 / NBX-6166

Wavelength	1550 ± 2 nm												
Displaying Range	100m ~ 100km (step: 1000m, 1km, 10km)												
Measurement Freq. Range	9 ~ 13 GHz												
Measurement Strain Range	-30,000 to +40,000 με (-3% to +4%)												
Freq. Scan Step	5, 10, 20, 50 MHz												
Readout Resolution	5cm, 10cm, 20cm, 50cm, 100cm												
Sampling Points	600,000 (maximum)												
Average Count	2^5 to 2^{24} (incl. Hardware Average Count 2^{16})												
Model	***NBX-6066***												
Function	PPP-BOTDA				BOTDR								
Pulse Width (ns)	1	2	5	10	5	10	20	50					
Spatial Resolution (m)	0.1	0.2	0.5	1	0.5	1	2	5					
Dynamic Range (dB) *1	1	2.5	3	6	2	4	6	10					
Measurement Range (km) *2	2	5	10	20	5	10	15	25					
Accuracy *3 *4	7με / 0.3°C				50με / 2.5°C	30με / 1.5°C							
Repeatability *3 *4 *5	3με / 0.15°C				20με / 1.0°C	20με / 1.0°C							
Model	***NBX-6166***												
Function	PPP-BOTDA				BOTDR								
Pulse Width (ns)	1	2	5	10	5	10	20	50	100	200	500	1000	
Spatial Resolution (m)	0.1	0.2	0.5	1	0.5	1	2	5	10	20	50	100	
Dynamic Range (dB) *1	2	3.5	6	8	3	5	8	12	15	16	22	24	
Measurement Range (km) *2	5	10	20	25	10	15	25	40	45	50	70	80	
Accuracy *3 *4	20με / 1.0°C				40με / 2.0°C								
Repeatability *3 *4 *5	10με / 0.5°C				20με / 1.0°C								
Function	COTDR												
Pulse Width (ns)	5	10		20	50	100		200		500		1000	
Spatial Resolution (m)	0.5	1		2	5	10		20		50		100	
Dynamic Range (dB) *1	10	13		16	20	23		26		30		30	
Measurement Range (km) *2	27	40		50	60	70		80		80		80	
High-speed Measurement	FS Mode*6	< 15 Hz											
	AT Mode*7	< 550 Hz											
Applicable Sensing Fiber	Single Mode Fiber												
Connector Type	FC/APC (factory default)												
Input/output Interface	USB 2.0 x4, LAN x2, RGB x1												
Power Supply	AC100 ~ 240V, 50/60Hz, 250VA												
Laser Safety Class	Class 1 (IEC60825-1 : 2001)												
Dimensions / Weight	approx. 456 (W) × 485 (D) × 286 (H) mm / 30 kg												
Operating Temperature	10 ~ 40 °C, Humidity below 85% (no dew condensation)												
Storage Temperature	0 ~ 50 °C												
Place of Production	Japan												

*1. Based on 2^{16} average cycles.
*2. Based on average fiber loss of 0.3 dB/km using single mode fiber.
*3. Based on the measurement of strain-free, UV-coated fiber.
*4. Based on the measurement with strain-free, UV-coated fiber and in constant temperature environment.
*5. Maximum standard deviation of measurement value in 5 consecutive measurements for 100 consecutive points.
*6: The settings of 50 m range, 2^8 count settings, 41 scanning steps in batch processing mode. (PPP-BOTDA Only)
*7: The settings of 50 m range, 2^8 count settings, 1 scanning step in batch processing mode.
*1-*5 are all based on a frequency scan step of 5 MHz with Pre-Pump Adjustment on.

* The specifications above and accessories layout are subject to change without notice. (20191118, A4)

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