

Give you a feel[®]
When every point of the optical fiber is a sensor

Neural Optical Fiber Scope

NEUBRESCOPE NBX-6026 / NBX-6056

The Brillouin Backscattering Analyzer with patented Pulse-Pre-Pump technology that dedicates for distribution fiber optic Strain and/or Temperature measurement



Built-in operation controller and data analyzer

The **cm-grade** Spatial Resolution in **2cm** (NBX-6026) / **5cm** (NBX-6056)

Strain Repeatability: **7.5 $\mu\epsilon$** (NBX-6026) / **3 $\mu\epsilon$** (NBX-6056)

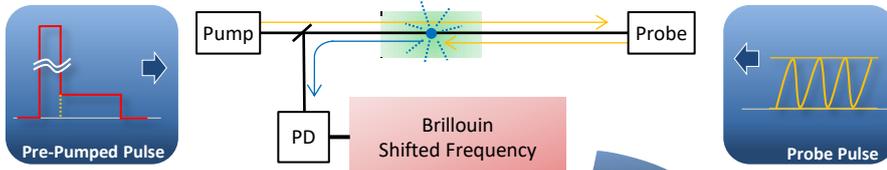
Temperature Repeatability: **0.35 $^{\circ}\text{C}$** (NBX-6026) / **0.15 $^{\circ}\text{C}$** (NBX-6056)

High Speed measurement up to **550 times/sec** (NBX-6056)





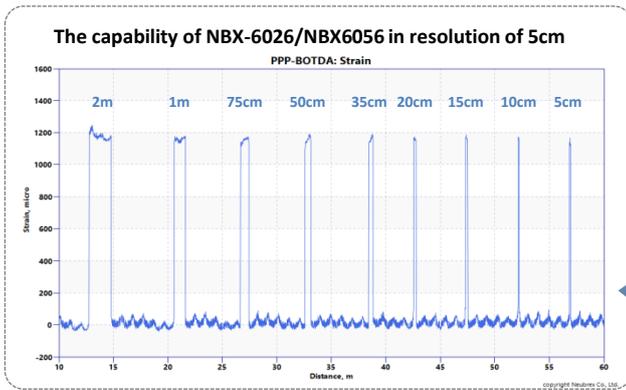
The Principle of PPP-BOTDA



The patented pump laser control technology; the Pulse Pre-Pump (PPP) was conducted into the NBX-6026/NBX-6056 with the sophisticated design and state-of-art manufacturing.

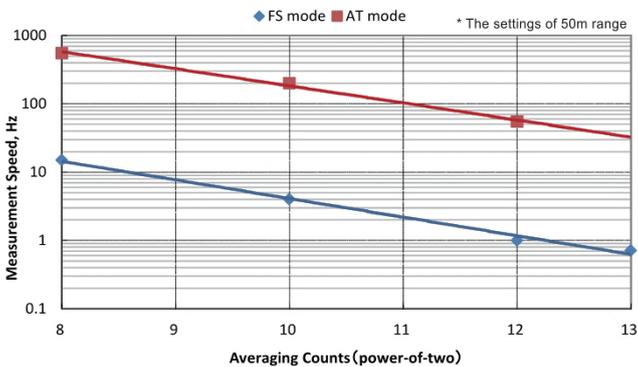
By the pre-stimulated Brillouin effects in the sensing fiber, the NBX-6026/NBX-6056 has better gain response from the activated area of Strain or Temperature.

The measurement data resolution can be significantly improved to the level of 5 cm-order, and the measurement accuracy can be up to $7.5\mu\epsilon / 3\mu\epsilon$.



Capabilities

Relation between measurement and averaging counts



The NEUBRESCOPE NBX-6026/NBX-6056 offers two high speed measurement modes:

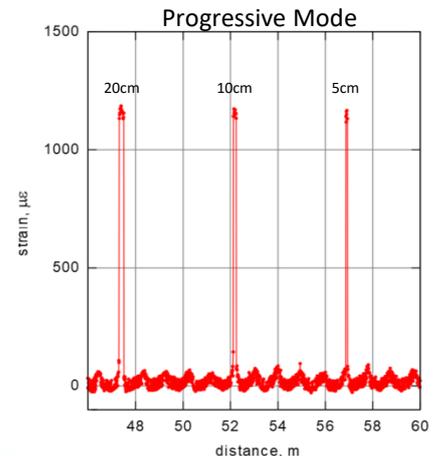
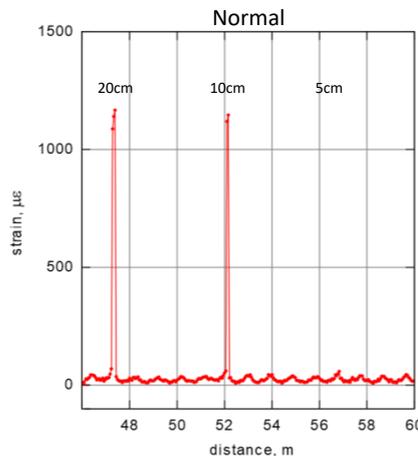
- Frequency Scanning (FS) Mode.
- Amplitude Transfer (AT) Mode.

On the left the picture denotes the high speed measurement result of FS Mode and AT Mode. The test specimens is an aluminum plate in 100cm x 5cm size, and vibrated in 10Hz at one end of the plate.

As the result, the measurement speed is related with the length of fiber and the average counts. More details can be obtained by contact our representatives respectively.

The NBX-6026/NBX-6056 provides the Progress Mode that provides higher spatial resolution for the certain applications as required.

In progressive mode, high spatial resolution is achieved by specially designed pulse pre-pump scheme, resulting in signal power level higher by 1.5 dB than that of Normal measurement mode.



Specifications NBX-6026 / NBX-6056

Measurement Mode	PPP-BOTDA								
Wavelength	1550 ± 2 nm								
Displaying Range	25km								
Measurement Freq. Range	9 ~ 13 GHz								
Measurement Strain Range	-30,000 to +40,000 $\mu\epsilon$ (-3% to +4%)								
Freq. Scan Step	1, 2, 5, 10, 20, 50 MHz								
Readout Resolution	5cm (default), 1cm (minimum)								
Sampling Points	600,000 (default)								
Average Count	2 ⁵ to 2 ²³ (incl. Hardware Average Count 2 ¹⁶)								
Model	NBX-6026				NBX-6056				
Pulse Width (ns)	0.2	0.5	1	2	0.5	1	2	5	10
Spatial Resolution (cm)	2	5	10	20	5	10	20	50	100
Dynamic Range (dB) *1	0.5	1	1.5	3	1	1.5	3	3	6
Measurement Range (km) *2	0.5	1	2	5	1	2	5	10	20
Optical Budget *1 *6	2	3	5	7	2	5	7	8	10
Measurement Accuracy *1 *3 *4	15 $\mu\epsilon$ / 0.75°C		7.5 $\mu\epsilon$ / 0.35°C		15 $\mu\epsilon$ / 0.75°C		7 $\mu\epsilon$ / 0.3°C		
Repeatability *1 *3 *4 *5	10 $\mu\epsilon$ / 0.5°C		7.5 $\mu\epsilon$ / 0.35°C		7.5 $\mu\epsilon$ / 0.35°C		3 $\mu\epsilon$ / 0.15°C		
Measurement Time *7 (NBX-6026 Only)	10 sec (at Readout Resolution 5cm) 60 sec (at Readout Resolution 1cm)				-				
High-Speed Measurement (NBX-6056 Only)	-				Frequency Sweep (FS) Mode*8 : < 15 Hz Amplitude Transfer (AT) Mode *9 : < 550Hz				
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 2¹⁵ average cycles by progressive measurement mode.

*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 of strain-free, UV-coated fiber and in constant temperature environment.

*5: The maximum standard deviation of measurement value in 5 consecutive measurements for 100 consecutive points.

*6: Within the allowable range adjusted by the optical power excluding the case of nonlinear phenomena.

*7: The settings of 50 m distance range, 2¹⁴ count settings, 41 scanning steps excluding the time for Pulse Adjustment.

*8: The settings of 50 m range, 2⁸ count settings, 41 scanning steps in batch processing mode.

*9: The settings of 50 m range, 2⁸ count settings, 1 scanning step in batch processing mode.

*1 to *7 are all based on a frequency scan step of 5 MHz and with Pulse Adjustment and Auto Frequency Adjustment on.

* The specifications above and accessories layout are subject to change without notice.
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