

51nano-S-1550-4.5-Q04-P-5-2-28-0-150

Fiber-coupled low coherence laser source with polarization-maintaining fiber cable



FEATURES

The Laser Diode Beam Source of type 51nano-S-1550-4.5-Q04-P-5-2-28-0-150 has a reduced power noise, a reduced coherence length and a low speckle contrast.

- Reduced power noise: typ. < 0.05 % of P₀ (RMS, Bandwidth < 1 MHz)
- Reduced coherence length: coherence length ≈ 300 µm
- Reduced speckle contrast
- Wavelength: 1550 nm
- Laser output power: 4.5 mW
- Polarization-maintaining fiber cable
- FC APC connector (8°-polish)
- Modulation analog and TTL
- With interlock and key switch (conform to EN 60825-1)

Alternative: Laser Diode Beam Source <u>51nano-N</u> (OEM version w/o key switch and w/o interlock)

DESCRIPTION

The fiber-coupled Laser Diode Beam Source of type 51nano-S-1550-4.5-Q04-P-5-2-28-0-150 has a reduced power noise (typ. < 0.05 % of P_0 (RMS, Bandwidth < 1 MHz)), reduced coherence length (\approx 300 μ m) and a lowered speckle contrast.

Electrical features

The output power is adjustable using a potentiometer or using the two modulation inputs for analog and TTL

Fiber cable

The source is fiber-coupled to a polarization-maintaining fiber cable (standard, polarization extinction ratio ≥ 23 dB). As a result the beam profile is rotationally symmetric with Gaussian intensity distribution. The fiber cable is equipped with an FC APC type connector (8°-polish). The fiber cable has a strain-relief and a protective sleeving (\emptyset 3 mm). Standard cable length is 150 cm.



Options:

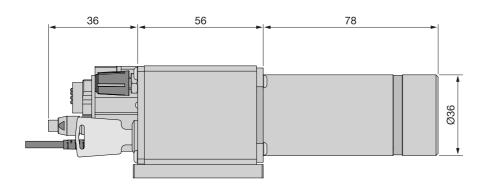
- Single-mode fiber
- Core-centered (single-mode only)
- Multiple fiber output cables (51nanoC, single-mode only)
- Other connector types including FC PC, DIN or AVIO, or E2000
- Other fiber cable lengths
- Incorporated vacuum feed-through

Laser safety

The laser safety is conform to IEC 825 / EN 60825-1.

- Interlock chain for the remote deactivation of the laser
- Laser power-up is only possible using the key switch
- LED status indicator for "Laser ON"
- For a quick start the laser is shipped with a interlock connector type <u>BC0106F-iLCK</u>

An OEM version is available as type <u>51nano-N</u> without key switch or interlock which is not conform to EN 60825-1.



TECHNICAL DATA

51nano-S-1550-4.5-Q04-P-5-2-28-0-150

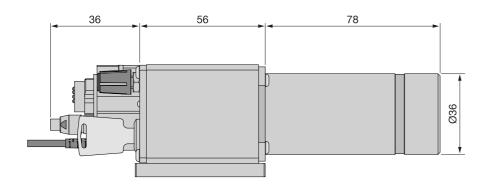
Order Code	51nano-S-1550-4.5-Q04-P-5-2-28-0-150	
Will replace	51nanoFCM-S-1550-4.5-Q04-P-5-2-28-0-150	
Series	51nano-S (PM)	
Laser class	1	
Center wavelength	1550 ± 20 nm	
Bandwidth	0.7 - 4 nm	
Output power	typ. 4.5 mW	
Power adjustment	< 1 - 100 %	
Power noise	typ. < 0.05 % of P_0 (RMS, BW < 1 MHz)	



Fiber cable polarization-maintaining Fiber type PMC-1300 Nominal fiber NA 0.12 Effective fiber NAe² 0.077 ± 10 % (1/e²) Mode field diameter MFD 12.8 μm ± 10 % (1/e²) PER ≥ 23 dB Fiber cable length 1.5 ± 0.05 m (standard) Fiber cable type Ø 3 mm with Kevlar strain-relief Fiber connector type FC APC (standard) Power stability max. 12 % power variation between 15°C and 35°C Electronics type H Electr. cable length 1.5 ± 0.1 m (standard) Connector type 3 pin (male, Lumberg SV30) Supply voltage 5.0 ± 0.2 V Max. current consumption* 260 mA Modulation input connector 6 pin (male, Lumberg SV60) Modulation inputs Analog TTL Max. input voltage 5 V 5 V Voltage for P _{min} / Po 0 V / 2.5 V 5 V Voltage for P _{min} / Po 0 V / 2.5 V 2 C Avhm Max. modulation frequency 1.00 kHz 1.00 L μs Time delay ON/OFF* 2/0.3 μs	Coherence length	oherence length ≈ 300 μm		
Nominal fiber NA 0.12 Effective fiber NA _e ² $0.077 \pm 10 \% (1/e^2)$ Mode field diameter MFD $12.8 \mu m \pm 10 \% (1/e^2)$ PER $23 dB$ Fiber cable length $1.5 \pm 0.05 m$ (standard) Fiber cable type $\emptyset 3 mm with Kevlar strain-relief$ Fiber connector type FC APC (standard) Power stability max. $12 \% power variation between 15 ^{\circ}C and 35 ^{\circ}C$ Electronics type H Electr. cable length $1.5 \pm 0.1 m (standard)$ Connector type $3 pin (male, Lumberg SV30)$ Supply voltage $5.0 \pm 0.2 V$ Max. current consumption* $260 mA$ Modulation input connector $6 pin (male, Lumberg SV60)$ Modulation input connector $6 pin (male, Lumberg SV60)$ Modulation input voltage $5 V 5 V$ Voltage for P_{min} / P_O $0 V / 2.5 V V 5 V$ Voltage for P_{min} / P_O $0 V / 2.5 V V V V V V V V V $	Fiber cable polarization-maintaining			
Effective fiber NAe² 0.077 ± 10 % (1/e²) Mode field diameter MFD 12.8 μm ± 10 % (1/e²) PER ≥ 23 dB Fiber cable length 1.5 ± 0.05 m (standard) Fiber cable type Ø 3 mm with Kevlar strain-relief Fiber connector type FC APC (standard) Power stability max. 12 % power variation between 15°C and 35°C Electronics type H Electr. cable length 1.5 ± 0.1 m (standard) Connector type 3 pin (male, Lumberg SV30) Supply voltage 5.0 ± 0.2 V Max. current consumption* 260 mA Modulation input connector 6 pin (male, Lumberg SV60) Modulation input connector 6 pin (male, Lumberg SV60) Modulation input voltage 5 V 5 V Voltage for P _{min} / P _O 0 V / 2.5 V < 0.8 V / > 2 C × 0.8 V / > Voltage for P _{min} / P _O 0 V / 2.5 V < 0.8 V / > 2 C × 0.8 V / > <t< th=""><th colspan="3">Fiber type PMC-1300</th></t<>	Fiber type PMC-1300			
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Electronics typeHElectr. cable length $1.5 \pm 0.1 \text{ m}$ (standard)Connector type $3 \text{ pin (male, Lumberg SV30)}$ Supply voltage $5.0 \pm 0.2 \text{ V}$ Max. current consumption* 260 mA Modulation input connector $6 \text{ pin (male, Lumberg SV60)}$ Modulation inputsAnalogTTLMax. input voltage 5 V 5 V Voltage for P_{min} / P_O $0 \text{ V} / 2.5 \text{ V}$ $< 0.8 \text{ V} / > 2.4 \text{ V}$ Input impedance 22 kOhm 22 kOhm Max. modulation frequency 100 kHz 100 kHz Time delay ON/OFF* $2/0.3 \text{ µs}$ $1.5/0.1 \text{ µs}$ * Typical value. Depends on laser diode.Operating temperature $15 - 35^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ Warm-up timeapprox. 10 min Air humiditymax. 90% non-condensingWeight 530 g Dimensions $50 \times 58 \times 166 \text{ mm}$	Fiber connector type	FC APC (standard)		
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Modulation input connector6 pin (male, Lumberg SV60)Modulation inputsAnalogTTLMax. input voltage 5V 5V Voltage for P_{min} / P_{O} $0 \text{V} / 2.5 \text{V}$ $< 0.8 \text{V} / > 2.4 \text{V}$ Input impedance 22kOhm 22kOhm 22kOhm Max. modulation frequency 100kHz 100kHz Time delay ON/OFF* $2/0.3 \mu \text{s}$ $1.5/0.1 \mu \text{s}$ Rise / fall time* $1.0/1.0 \mu \text{s}$ * Typical value. Depends on laser diode.Operating temperature $15 - 35 \text{°C} \pm 0.5 \text{°C}$ Warm-up timeapprox. 10min Air humiditymax. 90% non-condensingWeight 530g Dimensions $50 \text{x} 58 \text{x} 166 \text{mm}$	Supply voltage	5.0 ± 0.2 V		
Modulation inputsAnalogTTLMax. input voltage 5V 5V Voltage for P_{min} / P_{O} 0V / 2.5V $< 0.8 \text{V}$ / $> 2.4 \text{V}$ Input impedance 22kOhm 22kOhm Max. modulation frequency 100kHz 100kHz Time delay ON/OFF* $2/0.3 \mu \text{s}$ $1.5/0.1 \mu \text{s}$ Rise / fall time* $1.0/1.0 \mu \text{s}$ $1.0/1.0 \mu \text{s}$ * Typical value. Depends on laser diode.Operating temperature $15 - 35^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ Warm-up timeapprox. 10min Air humiditymax. 90% non-condensingWeight 530g Dimensions $50 \times 58 \times 166 \text{mm}$	Max. current consumption*	260 mA		
Max. input voltage 5 V 5 V Voltage for P_{min} / P_O $0 \text{ V} / 2.5 \text{ V}$ $< 0.8 \text{ V} / > 2.4 \text{ V}$ Input impedance 22 kOhm 22 kOhm Max. modulation frequency 100 kHz 100 kHz Time delay ON/OFF* $2/0.3 \mu\text{s}$ $1.5/0.1 \mu\text{s}$ Rise / fall time* $1.0/1.0 \mu\text{s}$ $1.0/1.0 \mu\text{s}$ * Typical value. Depends on laser diode.Operating temperature $15 - 35^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ Warm-up timeapprox. 10 min Air humiditymax. 90% non-condensingWeight 530 g Dimensions $50 \times 58 \times 166 \text{ mm}$	Modulation input connector	6 pin (male, Lumberg SV60)		
$\begin{tabular}{ l l l l l l l l l l l l l l l l l l l$	Modulation inputs	Analog	TTL	
Input impedance 22 kOhm 22 kOhm Max. modulation frequency 100 kHz 100 kHz Time delay ON/OFF* 2/0.3 μ s 1.5/0.1 μ s Rise / fall time* 1.0/1.0 μ s 1.0/1.0 μ s *Typical value. Depends on laser diode. Operating temperature 15 - 35°C \pm 0.5°C Warm-up time approx. 10 min Air humidity max. 90 % non-condensing Weight 530 g Dimensions 50 x 58 x 166 mm	Max. input voltage	5 V	5 V	
$\begin{array}{c ccccc} \textbf{Max. modulation frequency} & 100 \text{ kHz} & 100 \text{ kHz} \\ \hline \textbf{Time delay ON/OFF*} & 2/0.3 \mu s & 1.5/0.1 \mu s \\ \hline \textbf{Rise / fall time*} & 1.0/1.0 \mu s & 1.0/1.0 \mu s \\ \hline * \textbf{Typical value. Depends on laser diode.} \\ \hline \textbf{Operating temperature} & 15 - 35^{\circ}\text{C} \pm 0.5^{\circ}\text{C} \\ \hline \textbf{Warm-up time} & approx. 10 \text{ min} \\ \hline \textbf{Air humidity} & max. 90 \% \text{ non-condensing} \\ \hline \textbf{Weight} & 530 \text{ g} \\ \hline \textbf{Dimensions} & 50 \times 58 \times 166 \text{ mm} \\ \hline \end{array}$	Voltage for P _{min} / P _O	0 V / 2.5 V		
Time delay ON/OFF* $2/0.3\mu s$ $1.5/0.1\mu s$ Rise / fall time* $1.0/1.0\mu s$ $1.0/1.0\mu s$ * Typical value. Depends on laser diode.Operating temperature $15 - 35^{\circ}C \pm 0.5^{\circ}C$ Warm-up timeapprox. 10 minAir humiditymax. 90 % non-condensingWeight $530~g$ Dimensions $50 \times 58 \times 166~mm$	Input impedance	22 kOhm	22 kOhm	
Rise / fall time* $1.0/1.0 \mu s$ $1.0/1.0 \mu s$ * Typical value. Depends on laser diode.Operating temperature $15 - 35^{\circ}C \pm 0.5^{\circ}C$ Warm-up timeapprox. 10 minAir humiditymax. 90 % non-condensingWeight $530 g$ Dimensions $50 \times 58 \times 166 mm$	Max. modulation frequency	100 kHz	100 kHz	
* Typical value. Depends on laser diode. Operating temperature 15 - 35°C ± 0.5°C Warm-up time approx. 10 min Air humidity max. 90 % non-condensing Weight 530 g Dimensions 50 x 58 x 166 mm	Time delay ON/OFF*	2/0.3 μs	1.5/0.1 μs	
Operating temperature $15 - 35^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ Warm-up timeapprox. 10 minAir humiditymax. 90 % non-condensingWeight 530 g Dimensions $50 \times 58 \times 166 \text{ mm}$	Rise / fall time*	1.0/1.0 μs	1.0/1.0 μs	
Warm-up timeapprox. 10 minAir humiditymax. 90 % non-condensingWeight530 gDimensions50 x 58 x 166 mm	* Typical value. Depends on laser diode.			
Air humidity max. 90 % non-condensing Weight 530 g Dimensions 50 x 58 x 166 mm	Operating temperature	15 - 35°C ± 0.5°C		
Weight 530 g Dimensions 50 x 58 x 166 mm	Warm-up time	approx. 10 min		
Dimensions 50 x 58 x 166 mm	Air humidity	max. 90 % non-condensing		
	Weight 530 g			
Protection Class IP30	Dimensions	Dimensions 50 x 58 x 166 mm		
	Protection Class IP30			



Dimensions (for a complete dimensional drawing please refer to the downloads section)



TECHNOTES

- Fiber-coupled low noise beam source
 Comparison of a low noise laser source to a conventional laser source
- 51nano: Electronics Type H
 Electronic features for electronics type H

DOWNLOADS



000829001100.pdf (Dimensional drawing)



Conformity 51nano 2023 E web.PDF (CE certificate)

ACCESSORIES

PS051003E Power Supply 5 V

BC0106F-ILCK Interlock connector

FIBER COLLIMATORS Fiber Collimators for collimating light exiting a single-

SINGLE-MODE/PM mode or polarization-maintaining fiber cable

RELATED PRODUCTS

51NANO-S (SINGLE- Fiber-coupled low coherence laser source with

MODE) single-mode fiber cable



51NANO-N (POLARIZATION-MAINTAINING, OEM) Fiber-coupled low coherence laser source with polarization-maintaining fiber cable (OEM version)

51NANOFI-S WITH FARADAY ISOLATOR

Fiber-coupled low coherence laser source with

polarization-maintaining fiber cable

(PM)

This is a printout of the page $\underline{\text{https://sukhamburg.com/products/details/51nano-S-1550-4}}$ from 5/4/2024

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