

Worked Example #1: Instrument Type Multi-Wavelength Light Source



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4 Wavelength Fiber coupled Laser Source 365nm + 405nm + xxx + xxx FILS000078 S/N: 12210121803-003



This device provides 120mW or 160mW optical power from current stabilized laser diodes. The lasers can be switched on and off manually. The power can be regulated with 270° knob.

Emission is indicated by a red LED at the fiber outputs. The laser emission can be switched by a TTL compatible signal at the back panel of the device via BNC connectors.

Caution: *Visible laser radiation of class 3B is emitted! Never look directly or indirectly into any optical output!*

Worked Example #1: Instrument Type Multi-Wavelength Light Source

1. Electrical specification

<u>Parameter</u>	<u>Specification</u>
Input	100-240VAC @ < 0,5 A (Fuse 2AT)
Interlock	M8 connector (short pin 1 and 3)
TTL	BNC connector, TTL active high, pull up

2. Optical specification

<u>Parameter</u>	<u>Specification</u>
Power	120 mW @ 375nm 160mW @405nm
Center Wavelength	375nm +/- 10nm 407 nm +/- 7nm add-on kit for wavelength # 3 and # 4
Connector	FC/PC (200µm MMF, SI)

3. Mechanical specification

<u>Parameter</u>	<u>Specification</u>
Height	90 mm
Width	310 mm
Length	270 mm
Weight	2kg

4. Operating conditions

<u>Parameter</u>	<u>Specification</u>
Storage	-20°C – 60°C
Operation	0°C – 40°C (non condensing)

Worked Example #2: Lab Type Point-Light Source



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SLD Source 830nm 2mW FC/APC

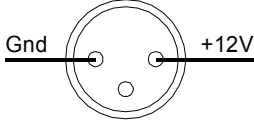


This module provides approximately 2mW of optical power from a current and temperature stabilized 830nm SLD out of a SMF terminated with a FC/APC connector. The module must be supplied with 12 V DC voltage. The SLD can be switched on and off manually or switched to a position where an external TTL modulation via BNC plug switches the SLD. Operation is indicated by a LED (red) beside the switch.

Caution: *Visible laser radiation of class 3R is emitted! Never look directly or indirectly into any optical output!*

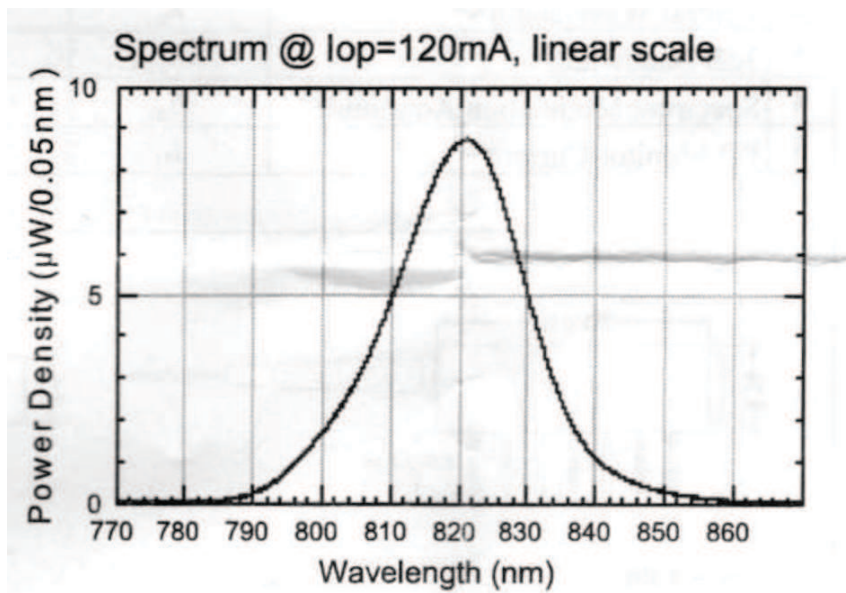
Worked Example #2: Lab Type Point-Light Source

1. Electrical specification

<u>Parameter</u>	<u>Specification</u>
Input DC connector	+11 V..+13 V DC reg. @ < 0,5 A 
Interlock connector	SUB-D9 female →Short Pin1 and 2 for normal operation
Modulation	BNC TTL 50Ω (rise time <10ns optical)

2. Optical specification

<u>Parameter</u>	<u>Specification</u>
Power	2mW
Center Wavelength	820nm
Connector	FC/APC (5/125 μm SMF)



3. Mechanical specification

<u>Parameter</u>	<u>Specification</u>
Height	55 mm
Width	130 mm
Length	185 mm
Weight	750 g (without power supply)

Worked Example #3: Module Type Light Source with Small Spot Size Focuser



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26.04.2018

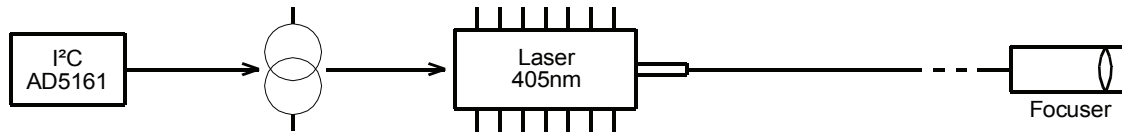
Laser Source with Focuser (405nm / 15mW)



This module provides approximately 15 mW optical output power at 405 nm wavelength. The laser diode inside is temperature and current stabilized. The light is focused by a Focuser at the end of the fiber pigtail. The module must be supplied with 12 V DC voltage, and the laser diode itself can be switched on and off manually. There also is the opportunity for external switching via a D Sub connector. Operation is indicated by a LED (red) beside the switch.

Caution: *Visible laser radiation of class 3R is emitted! Never look directly or indirectly into any optical output!*

Worked Example #3: Module Type Light Source with Small Spot Size Focuser



Basic structure

I²C-Port

The laser current is controlled by an I²C Potentiometer. An AD5161 is used for this purpose.(further information:

<http://www.analog.com/media/en/technical-documentation/data-sheets/AD5161.pdf>

The address of the I²C is set to **2Ch**, the data bytes that follow define the laser current.

examples:

$I_{\text{Laser}} = 0$ corresponds to **00 00h**

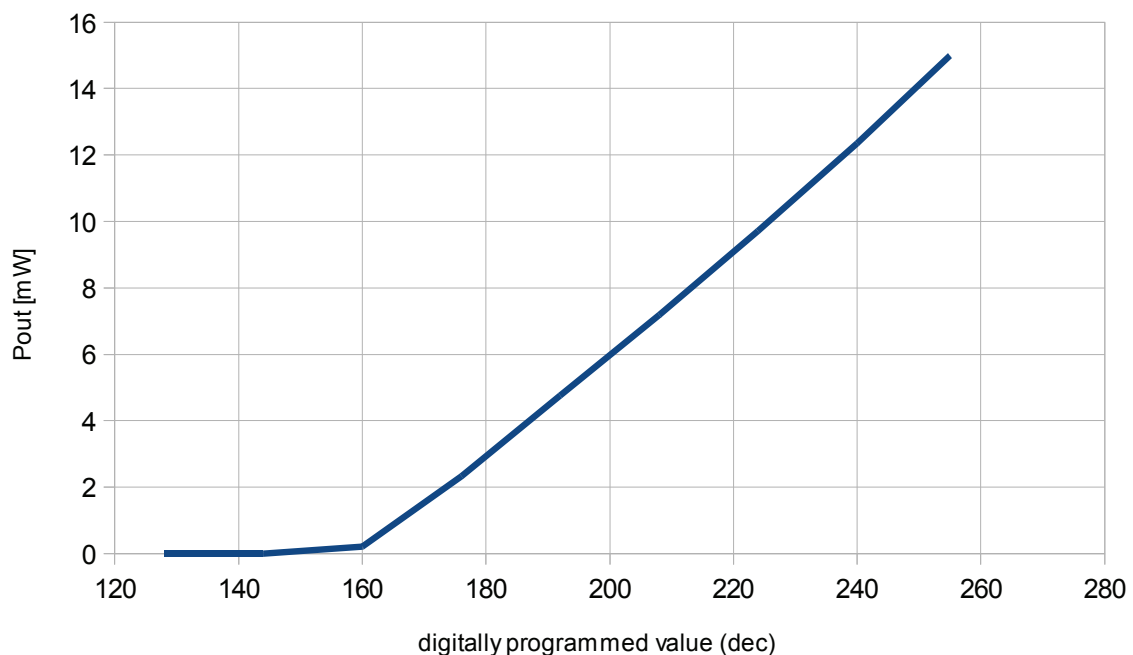
$I_{\text{Laser}} = \text{maximum}$ corresponds to **00 FFh**

After power on the device, the laser current I_{Laser} is set to a medium value (80h).

Operation of the device

To switch on the laser diode, the following steps are necessary

- the laser current must be set via the I²C port
- at the D Sub connector „enable“, pin 1 and 2 must be short circuited, indicated by the LED „Enabled“ (yellow)
- the switch „Emission“ must be set to „on“, indicated by the red LED.



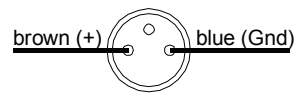
Worked Example #3: Module Type Light Source with Small Spot Size Focuser

Plot showing the optical output power over the set point of the I²C pots

1. Electrical specification

<u>Parameter</u>	<u>Specification</u>
Input powersupply	+11,5 V..+13 V DC reg. @ < 600 mA
Input I ² C, Enable	0 .. 5,0 V

DC connector



I²C connector:

D Sub 9 pol. male
SDA: Pin 3
SCL: Pin 4
Gnd: Pin 5

Enable connector

D Sub 9 pol. female
/Enable: Pin 1
Gnd: Pin 2

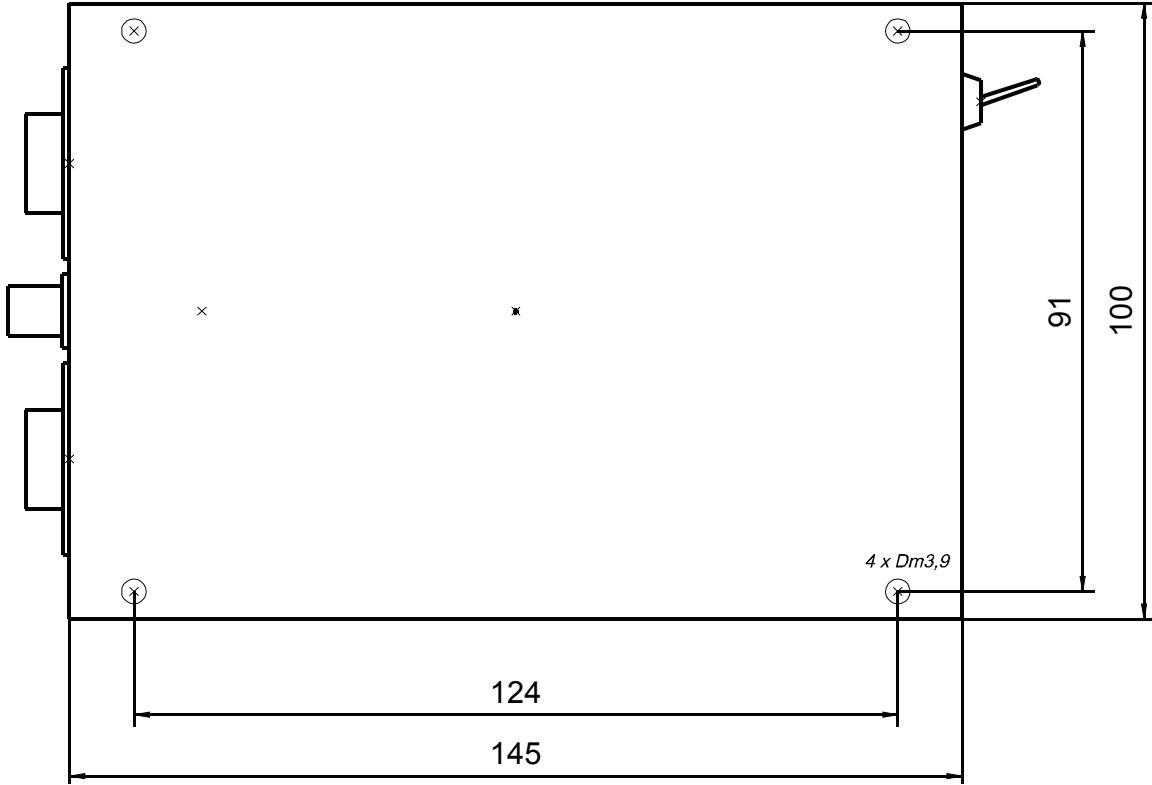
2. Optical specification

<u>Parameter</u>	<u>Specification</u>
Power	15 mW
Center Wavelength	405 nm
Focuser	2 μm spot size @3.5 mm distance
Spot Size: tested values	
diameter	1.25 μm
aspect ratio	0.9

Worked Example #3: Module Type Light Source with Small Spot Size Focuser

3. Mechanical specification

Parameter	Specification
Height	17 mm
Width	100 mm
Length	165 mm
Weight	350 g (without power supply)



Fixing Points



Fibotype

Worked Example #4: OEM-Type Light source (for printing head)

Features:

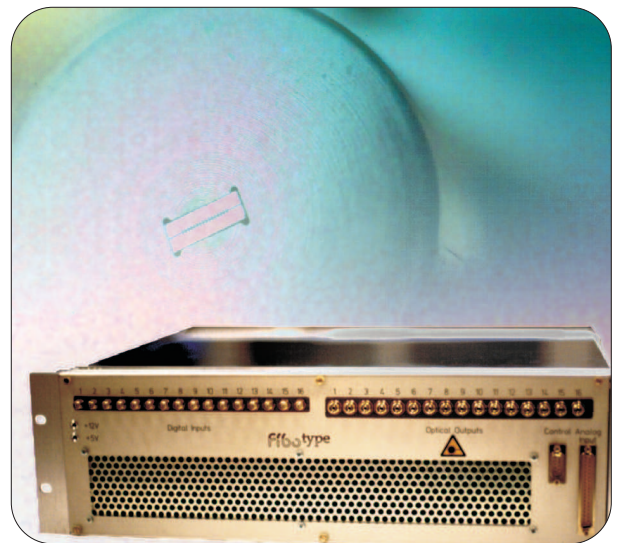
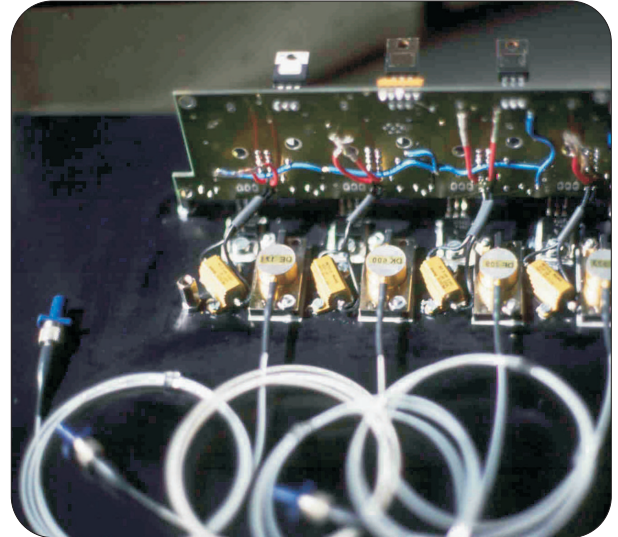
- high current drivers
- high speed
- wide choice of laserdiodes
- custom packages
- optics and fiber-arrays optional

MM-Fiber Coupled Laserdiode Subsystems

Fiber-coupled laserdiodes are widely used in many industrial applications such as the printing industry, other graphic arts, material processing and sensing instruments.

Laserdiodes need safe drive conditions guaranteed by ready-to-use laserdiode subsystems. These products are cost savers for the customers dealing with industrial environment or growing complexity of the final system. Fibotec offers subsystems that provide fast modulation of high-current laserdiodes with fiber arrays attached.

Laserdiodes to be integrated to a subsystem are used according to the customer's need from a variety of different suppliers or specified by the final customer to address certain purchasing agreements or qualification processes.



FIBOTEC





Fibot type

Worked Example #4: OEM-Type Light source (for printing head)

Specifications: MM-Fiber Coupled Laserdiode Subsystems

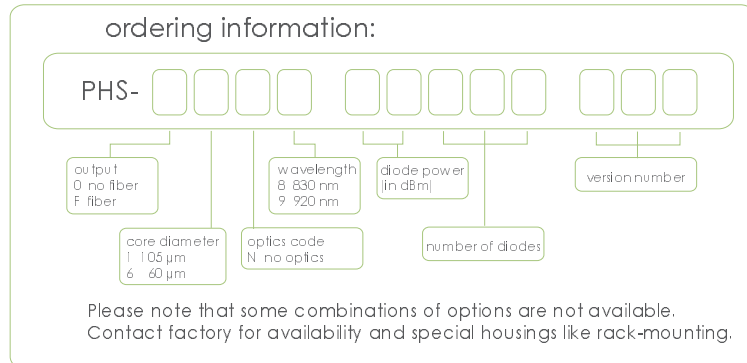
Parameter	PHS-F6N8 28001 01	PHS-F6N8 28004 01	PHS-F1N9 34004 01	unit
laserdiodes / module	1	4	4	pcs.
power / channel	0.65	0.65	2.5	W
wavelength	typ. 830	typ. 830	typ. 830	nm
fiber core diameter*	60	60	104	µm
NA out of fiber*	0.14	0.14	0.14	
fiber pitch*	N/A	128	128	µm
rise/fall time	max. 50	max. 50	max. 200	ns
drive current @5 VDC	2	8	25	A

* arrayed output

Options:

- A: customized packaging
- B: different fiber core diameter or NA and laserdiode power or wavelength
- C: connectorized fiber ends or arrayed fiber with different pitch

Please indicate requirements by selecting options from the table or filling in desired values that still need to be confirmed by the manufacturer



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Specification:

- size: approx. 40 ccm/channel (without heatsink)
- weight: approx. 200 g (without heatsink)
- supply: 5 V DC
- working temperature: 10°C-30°C (non-condensing)
requires heatsinking (0.5°C/W)
aircooled option available
- storage temperature: -0°C-55°C

complies with CE

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