

FLEXPOINT® Machine Vision Lasers

MVmicro DIG Series

Microprocessor Controlled

The FLEXPOINT® MVmicro DIG series was developed for stand alone machine vision applications, primarily in use together with industrial cameras in 3D measurements. A built-in microprocessor offers various communication and reporting options.

The MVmicro DIG lasers are available with different line optics and wavelengths. Output powers up to 100 mW and a sophisticated focusing mechanism make them a universal tool for industrial inspection and 3D triangulation.



Features

- Uniform line
- Multiple lines
- Different focussing/optic options
- Available with adjustable or fixed focus
- Adjustable focus without removing the line optics
- Superior line and focussing quality
- Up to 100 mW
- Microprocessor controlled
- UART RS-232 communication
- Digital modulation and analog power adjustment included as standard
- Ruggedized housing for stand-alone applications
- Many options

Specifications

Fan angle	5, 10, 15, 20, 30, 45, 60, 75, 90 deg.
Line uniformity	± 20%, ± 10% as option (related to average power, within 80% of the line)
Line / focus options	Standard DL (for smaller line thickness) TS (for enhanced depth of focus)
Multiple lines	5 lines with 1.54° interbeam angle 11 lines with 1.6° interbeam angle
Wavelength	405 nm, 450 nm, 520 nm, 635 nm, 650 nm, 660 nm, 785 nm (other wavelengths on request)
Wavelength stability	≤ 0,25 nm/°C
Output power	<1 mW –100 mW (depends on wavelength)
Output power stability	< 5% (after warm up at 25 °C)
Digital modulation	up to 2 MHz, rise time < 50 ns, TTL logic, active low default
Analog power adjustment	linear range 0 to 5.0 V, max. bandwidth 1 kHz, active low default
Bore sighting	≤ 10 mrad
Pointing stability	10 µrad/°C
Focus	adjustable or fixed
Operating voltage	5 – 30 VDC (auto scaling reverse voltage protection)
Current consumption	< 400 mA (depending on laser diode)
Operating temperature (housing)	-20 to +50 °C (depends on wavelength)
Storage temperature	-20 to +60 °C
Housing material	Aluminum, red anodized, potential free
Housing dimensions	Ø 19 mm, l = 66,5 mm with fixed focus, l = 90 mm with adjustable focus
Protection class	IP54, IP67 as option
Connector	M12 sensor connector, 8 pins, series 713 (cable as option)
Accessories	Mount, laser safety eyewear

RS-232 Commands

Saving data and settings on the internal EEPROM

These modules have the option of storing relevant data and settings on the internal EEPROM. Data such as operating time can be stored; as well as operation parameters and production settings.

Command	Description	Return value
trig_x	x: active high/active low 1: active low (default) 2: active high	
dima xx_yy_z	analog power adjustment: xx → max. power adjustment [00 ... 50] (e.g. 00 ≙ 0V ... 50 ≙ 5V) yy → min. power adjustment [00 ... 50] (e.g. 00 ≙ 0V ... 50 ≙ 5V) z → modulation type [0, 1 or 2] 0: no modulation (disabled) 1: active low (default) 2: active high	
mon 1	12-bit resolution [0..4095]digits. permanent swm ESC → end of permanent swm	supply voltage [V] internal voltage [V] laser diode monitor current [μA] laser current [mA]
temp	temperature	temp: c
time	operating hours	days – hours – minuts
lasc	laser current	laser current [mA]

x) recommended terminal program: Turn Tem, for communication

Pin Out

PIN	Description	Comments
1	V_{IN}	input voltage
2	V_{power}	analog power adjustment input
3	V_{Mod}	trigger input
4	RxD	UART; communication interface
5	TxD	
6	C2CK	firmware flash access
7	C2D	
8	GND	ground

1. Analog power adjustment

Output power can be adjusted to any desired value within the capabilities of the installed laser diode. Due to safety regulations and laser classifications, the maximum output power can only be set by the factory during manufacture.

Please note: The maximum laser power is set during production; and the user can only reduce the laser power. This is locked via the firmware and password protected.

When using analog power adjustment, there is a distinction between active high and active low.

1.1. Active high

The output power of the laser is proportional to the input voltage. The input voltage can be set via RS-232 commands in the range 0 – 5 V.

1.2. Active low (default)

Inverse power adjustment follows an opposite relationship to the input voltage. The following graph (fig. 1) shows this relationship:

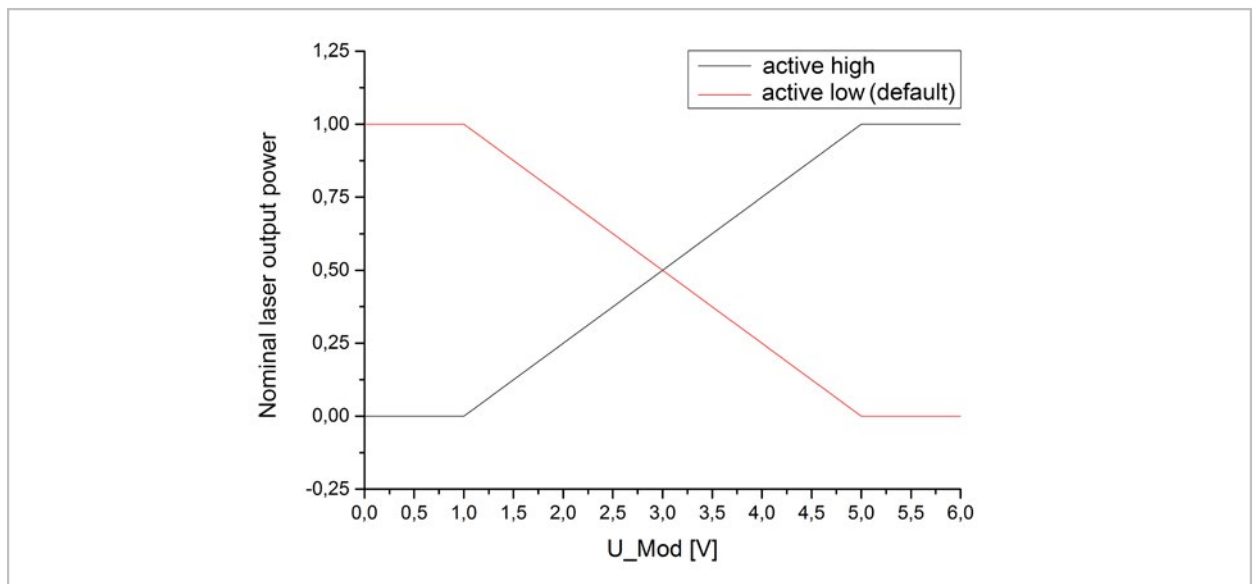


Fig. 1: Analog power adjustment

2. Digital modulation / Trigger

Triggering is controlled via an external TTL signal (transistor transistor logic).

The triggering signal can be switched between 2 input types:

- active high
- active low (default)

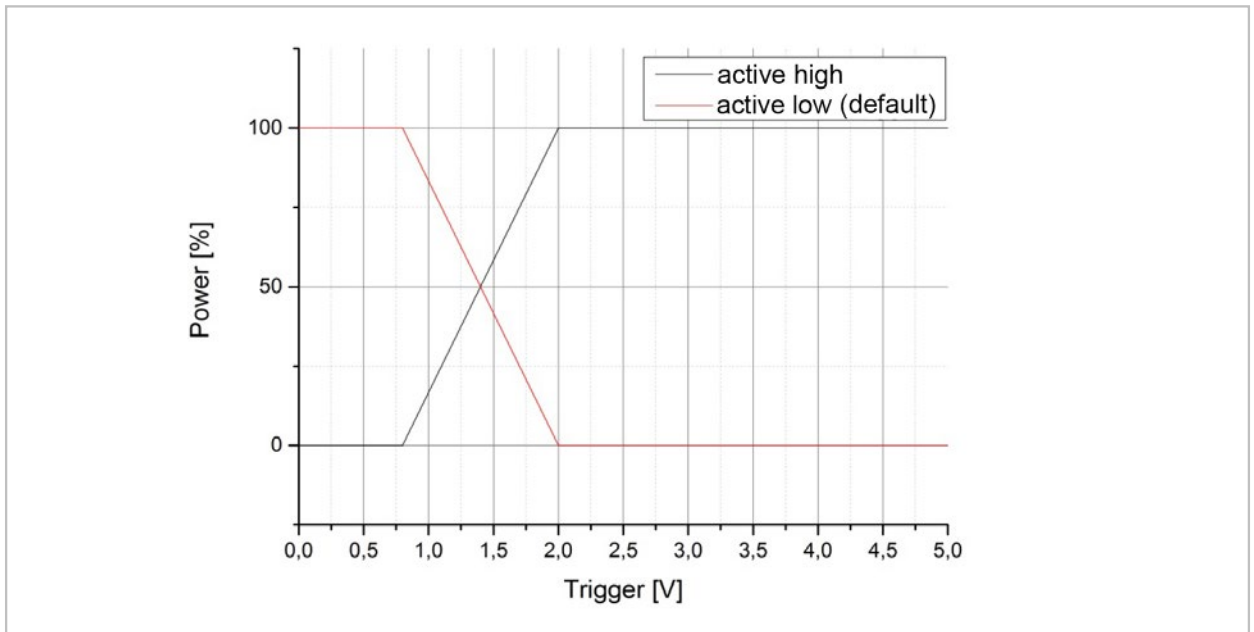


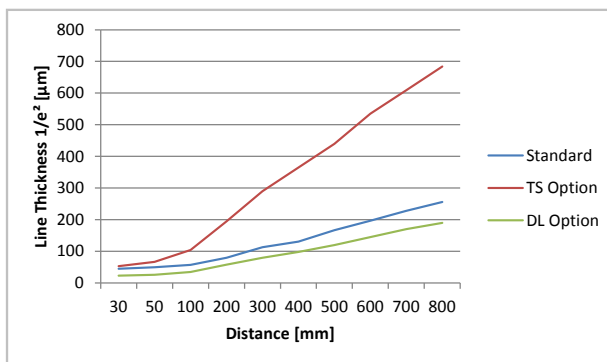
Fig. 2: Digital Modulation / Trigger

Line Width and Depth of Focus

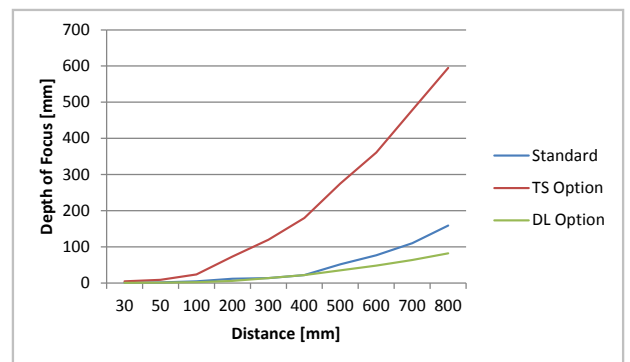
The following figures show the typical minimum line width (at $1/e^2$) and the typical focal depth that can be achieved with FLEXPOINT® MVmicro DIG lasers at different distances. The depth of focus is defined as the range in which the minimum line width increases by factor $\sqrt{2}$. Line lasers of the MVmicro DIG series can be focused between 30 mm and infinity. The lasers can be ordered with either adjustable focus, preset focus but still focusable or with fixed focus.

Farfield

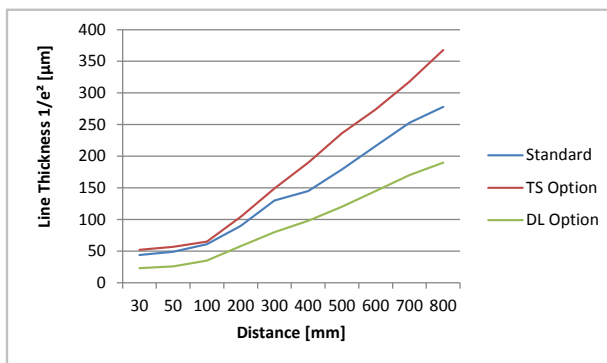
Line Thickness Farfield (P = 0...30 mW)



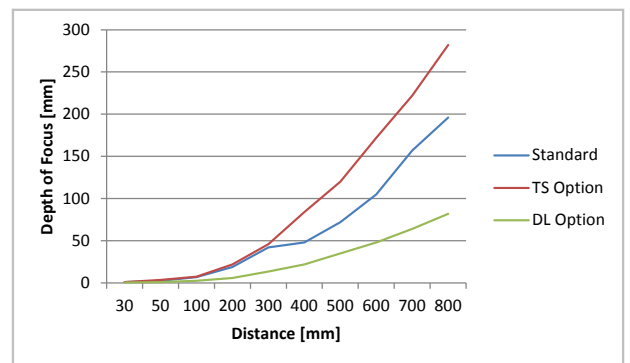
Depth of Focus Farfield (P = 0...30 mW)



Line Thickness Farfield (P = 0...100 mW)

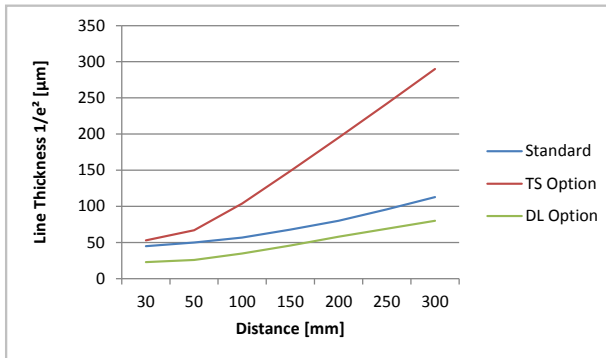


Depth of Focus Farfield (P = 0...100 mW)

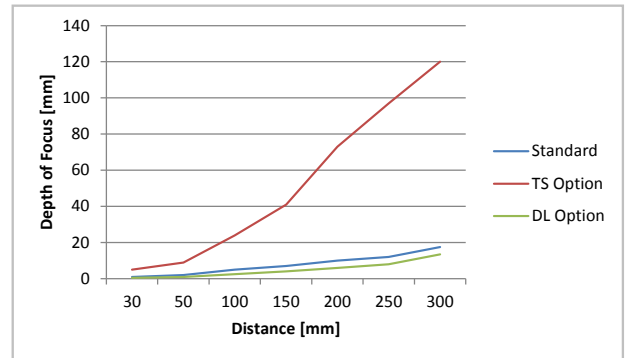


Nearfield

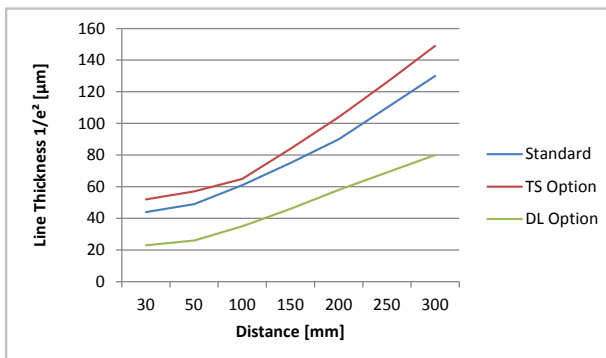
Line Thickness Nearfield (P = 0...30 mW)



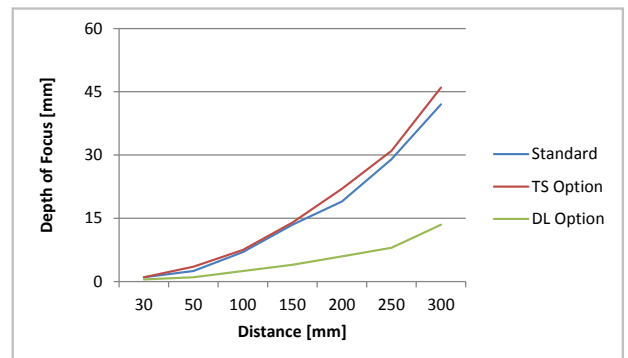
Depth of Focus Nearfield (P = 0...30 mW)



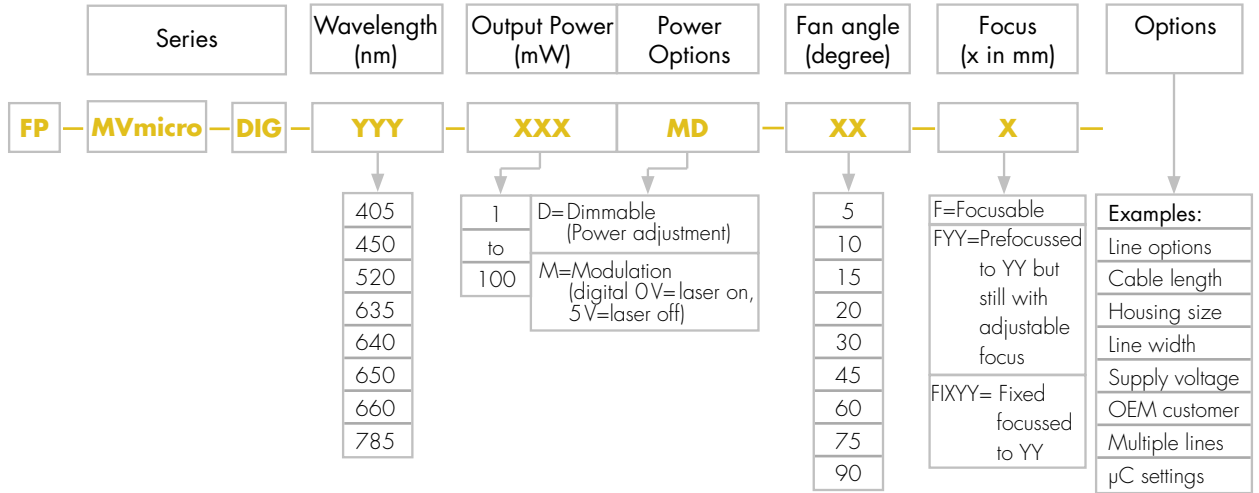
Line Thickness Nearfield (P = 0...100 mW)



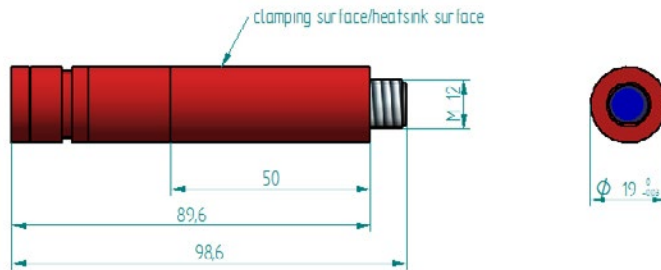
Depth of Focus Nearfield (P = 0...100 mW)



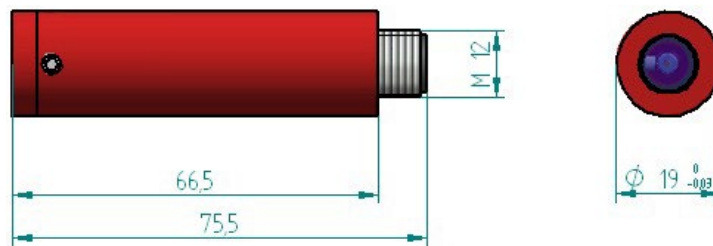
Ordering code FLEXPOINT® MVmicro DIG series



MVmicro DIG with adjustable focus



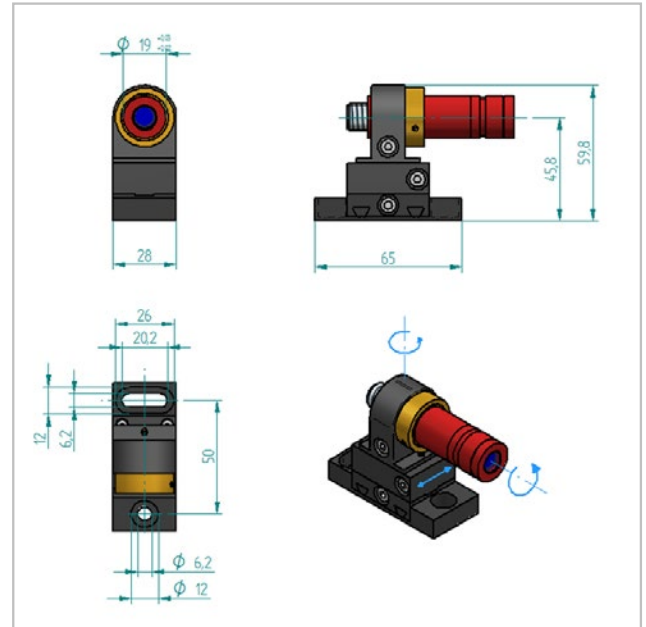
MVmicro DIG with fixed focus



Precision Mount for Laser Modules with 19 mm diameter

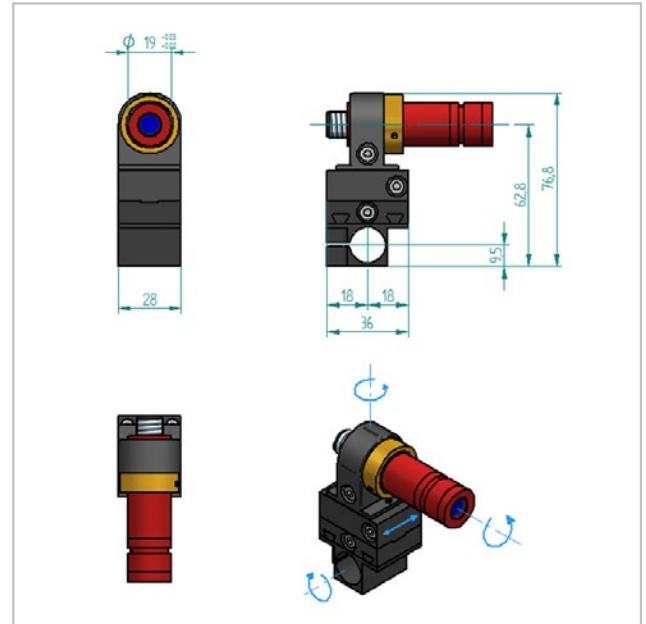
FP-MPT-19

- For flat surface mounting
- 360° rotation in 2 axes + parallel movement



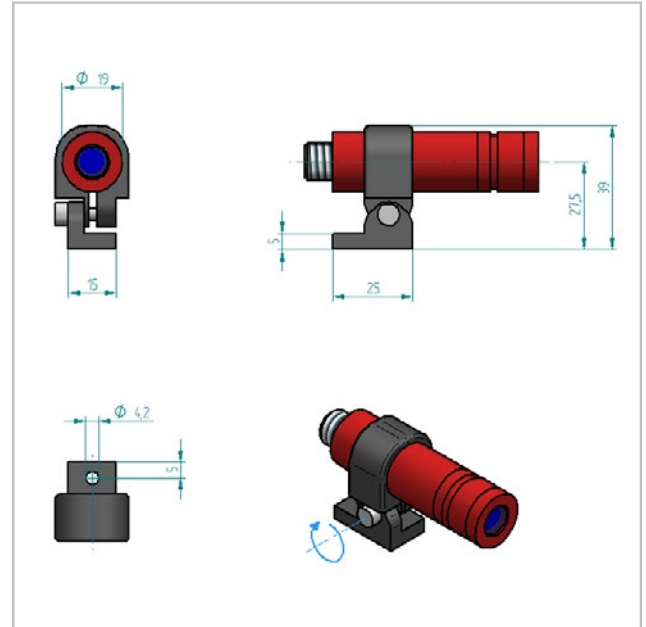
FP-MPS-19

- For mounting on a 16 mm shaft
- 360° rotation in 2 axes + parallel movement (+ rotation on shaft)



Standard Mount for Laser Modules with 19 mm diameter

FP-MS-19



FP-MG-19

