

Technical Information

Classification:	Release	Spec: 11 - 2020
Product Name:	Line laser modules, cross hair laser modules	
Description:	LLMi Hybrid laser modules 12mm	Rev: Running
Product line:	Line lasers, cross hair laser	

Product description:



Very small and reliable line laser and cross laser modules in different powers and wavelengths. The line position and focus are very easy to adjust.

The modules are designed in the latest hybrid circuit technology, which not only allows a wide supply voltage range but also a low heat development. Furthermore, all electronics are protected in the housing. All modules are equipped with kink-protected hose lines. Numerous electrical protective devices are mandatory

Adjustment of line width and optics

Both the focus (line width) and the line position (position) can be adjusted with the front screw adjustment. Once you have found the desired mounting distance, turn the front knurled ring until the line width corresponds to the best possible width. You can find a video instruction here:

<https://www.youtube.com/watch?v=U0Hlc3fbafE>

If a certain polarisation to the line is required, the line optic can also be changed in its position for screwing. To do this, turn the front holder completely out of the thread, then remove the collimator (black), turn the line optics by a few degrees, reinsert the collimator (manual screwing up to the pressure point) and then turn the entire element back into the actual module body. Please make sure that you do not touch the surfaces of the optics with your fingers! Use clean cotton swabs or plastic tweezers to adjust the line optics.



The optical assembly runs in an M9 x 0.5 fine thread, which has play in itself. This is intended. The position of the output beam in relation to the housing of the module can be adjusted by tilting the optics. It is thus possible for a laser cross to emerge absolutely concentric to the housing axis. To do this, first set the desired focus range, then tilt the optics slightly, which changes the position of the cross, and do not move it again until the screw lacquer has hardened. Detailed information on the bonding process can be found in the next section.

Fixation of optics

Once you have found the setting you want, the collimator can be glued into the housing using screw varnish. The glue should be viscous to avoid penetration into the module. (We recommend Electrolube BLR15ML) In

this case, the collimator assembly is first unscrewed relatively far, then screw varnish is applied to the thread and screwed back in to the appropriate focus. After the screw lacquer has dried, the optics is fixed.

Cleaning of optical elements

The cleaning of the optics is critical A dirty line optic or collimator optic shows itself through fogging and streaks around the laser line. If the optics have to be cleaned, preferably use clean compressed air or wound wooden cotton swabs (available at the pharmacy) and normal window cleaner. Make sure that after cleaning you rub with a dry cotton swab without pressure. Please note that the plastic optics are very sensitive to scratches. If the optical surfaces are scratched, they must be replaced.

Assembly and cooling

The LLMi modules do not require special cooling due to their specific design. In most cases it is sufficient to mount or clamp the module in a metal body to dissipate the heat. Care must be taken to ensure that no punctual pressure from a screw or similar is applied to the module housing. Ideally, the module is clamped flat.

MediaLas offers a wide range of different mounting options and brackets for mounting the line, cross and point laser modules.

	<p>3D ballhead mount</p> <p>Adjustable in tilt, Pan X, Pan Y, Angle 360°, tilting >180°.</p>
	<p>Pan/Tilt mount</p> <p>Solid XY bracket with adjustment possibilities in Pan and Tilt. Adjustment range 360° x 210°. The base plate can be adjusted by 90° by removing the lower screws.</p>
	<p>Mounting block</p> <p>Cooling and clamping block for easy mounting of all our 12mm modules.</p>
	<p>Flat mount</p> <p>Flat mount with clamp for our 12mm modules.</p>

Power supply / Connection

The LLMi modules in hybrid design have a very wide supply voltage range. Due to the internal switching regulator, the power consumption is almost linear over the entire voltage range. This means that with an increase in the supply voltage, the current consumption simultaneously decreases.

Due to the different operating voltages of the respective laser diodes, the supply voltage ranges of the laser modules are also different. Red laser diodes, with relatively low operating voltage, allow a supply voltage range of approx. 8 - 30 V. Green laser diodes require a higher voltage, which is why green modules cover a range of approx. 12 - 30 V.



Wire pair white / brown
White: + VDC
Brown: Mass
Longer connecting cables up to 100 m are possible at any time, depending on the customer's requirements.

Numerous protective measures are implemented in the internal electronics:

- Reverse polarity protection:** Currentless reverse polarity protection. If the polarity is reversed, simply nothing happens. After correct polarity, normal commissioning is possible without any restrictions.
- Over voltage protection:** The driver electronics switch off if the voltage is too high. The input protection is only destroyed when the destruction voltage of approx. 35 V is reached.
- Under voltage protection:** If the hybrid electronics receive too little supply voltage, it switches off to prevent an uncontrollable electrical operating state. Once the minimum voltage is reached, it is switched on again automatically.
- Switch-on delay:** To avoid switch-on peaks, the laser is only switched on after about 3 seconds.

General technical data

Diameter:	12 mm
Length:	55 mm housing length
Connection:	ca. 100 cm round cable, 3,2 mm diameter Cable ends with wire end sleeves
Source VCC:	Red LLMi Modules: ca. 8 – 30 VDC Green LLMi Modules: ca. 12 – 30 VDC
Switch off voltage:	ca. 1 V under VCC
Current consumption:	Depends on Laser power

Possible deflection angles and corresponding line lengths:

Angle	Distance	Line length ca.
5°	1m	8cm
10°	1m	0,17m
20°	1m	0,34m
35°	1m	0.62m
45°	1m	0.85m
60°	1m	1.16m
90°	1m	2m
110°	1m	3.0m
120°	1m	3.3m

Formula for calculation: **Line length = 2 x (tan (angle/2)) x distance**

Other possible line lengths can be found in our Online Shop.

Laser safety

Every laser is potentially dangerous. Therefore, the current regulations on laser safety must be observed and complied with. The current standards and regulations can be found in EN-60825-1 and/or IEC 60825-1.