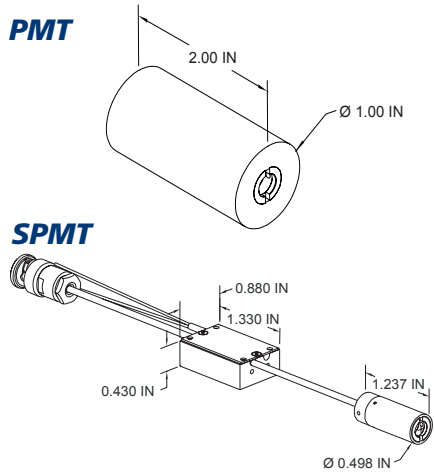


# TTL MODULATED LASERS



► SPMT is a separated geometry version of the PMT

SPMT, PMT, PPMT, & PMH

Our modules with digital beam output. TTL modulation can be used to enable, inhibit, or modulate a laser, making it an excellent resource for synchronized applications.

## TTL Modulated—

### PMT and SPMT Laser Modules:

The PMT and SPMT are versatile choices suitable for a variety of OEM environments. Both operate in constant current mode and are designed for digital beam modulation from CW to 20MHz. The PMT is a self-contained module, while the SPMT features a separated geometry. The separated geometry configuration promotes easy positioning of the components within the design constraints of your application.

## A<sub>+</sub> Recommended Option

For more control of your PMT and SPMT parameters, give option X22 (internal 3/4 pot) a try. See page 51 for more information.

MODULE SPECIFICATIONS	PMT	SPMT	PPMT	PMH	IQ1H/IQ2H <span style="color:red">NEW</span>
Dimensions, Ø x L, in. [mm]	1.0 x 2.05 [25.4 x 52.1]	.5 x 1.24 [12.65 x 31.42]	1.5 x 5.7 [38.05 x 144.78]	<del>1.0 x 2.65 [25.4 x 67.31]</del>	1.5 x 6.20 [38.05 x 157.48] / 1.5 x 7.52 [38.05 x 191.01]
Operating Voltage (VDC)	5 ± 0.5	5 ± 0.5	12 ± 1	<del>5—6.5</del>	11 - 14
Max. Operating Current (mA)	280	280	1500	<del>350</del>	3000
Max. Laser Drive Current (mA)	0 - 200	0 - 200	0 - 200	200-bias + 120-mod.	1000 bias + 120 mod.
Mod. Frequency Range (MHz)	CW - 20	CW - 20	CW - 20	<del>CW - 100*</del>	CW - 100*
Rise/Fall Times (ns)	6/15*	6/15*	6/15*	<del>2*</del>	2*
Propagation Delay (ns)	30*	30*	30*	<del>5*</del>	6*
Temperature Stability (°C)	—	—	.5	—	.002
Temperature Range (°C)	—	—	10 - 35	—	0 - 40
Control Signal Connector Type	SMC	BNC	BNC	<del>SMC</del>	SMC
Physical Diode Compatibility	9mm, 5.6mm	9mm, 5.6mm	9mm, 5.6mm	<del>9mm, 5.6mm</del>	9mm, 5.6mm
Diode Compatibility	all	all	all	all	all
Recommended Options**	D2, T, X22	D2, T, X25, X26	D2, D3, T	<del>D5, X21, X22, X23</del>	D4, D5, D6

\*Maximum modulation frequency and rise/fall times may vary depending on the laser diode chosen.

\*\*See pages 46 through 52 for our available options and accessories.

# TTL MODULATED LASERS

- **PPMT provides active temperature control for stability of output and wavelength**
- **PMH offers high speed beam modulation from CW to 100MHz**
- **IQ1H is available with an elliptical beam or a round beam achieved via a microlensed diode**
- **IQ2H incorporates anamorphic correcting prisms to produce a circularized beam**

## PPMT Laser Modules:

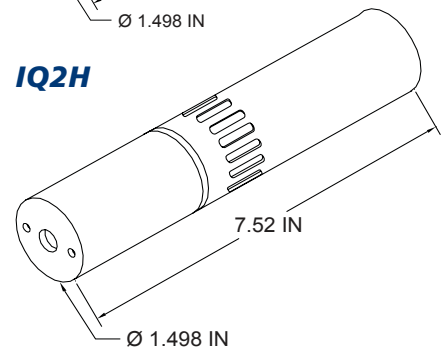
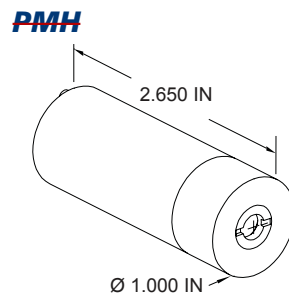
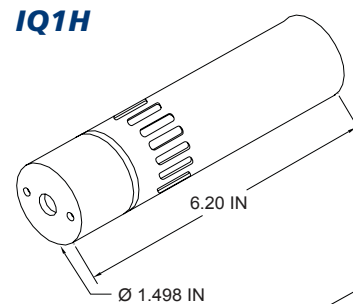
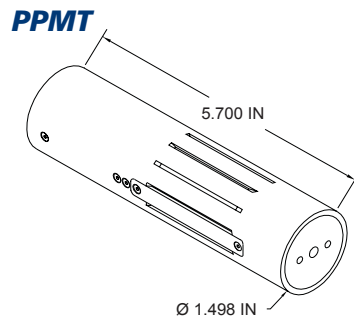
Like the PMT, the PPMT is designed for digital beam modulation from CW to 20MHz. However, the PPMT features active temperature control for added power and wavelength stability. The unit operates in constant current mode. Built-in potentiometers enable users to adjust the drive current or active temperature control parameters, and a 7-pin connector allows for DVM-compatible monitoring of these parameters.

## PMH Laser Modules:

The PMH offers beam modulation from CW to 100MHz, perfect for demanding applications where power and speed are of utmost importance. The module features digital beam modulation with drive currents up to 120mA.

## IQ1H & IQ2H Laser Modules:

For applications requiring beam modulation, power, speed, and our highest level of temperature stability available, the IQ1H and IQ2H are ideal solutions. Each incorporates a PID loop to control TE cooler output and features beam modulation from CW to 100MHz. The IQ1H is available with an elliptical beam or a round beam achieved via a microlensed diode. The IQ2H incorporates anamorphic prisms to produce a circularized beam.



**DVM-  
Compatible  
Monitoring**

The PPMT, IQ1H, and IQ2H allow for DVM-compatible monitoring of drive current and temperature control.

## Modulated Vs. Pulsed Lasers—

Pulsed lasers emit energy in a series of short bursts, or pulses, rather than in a continuous stream. Each pulse is essentially a bright flash of light, much like the flash of a camera, emitted at the wavelength of the diode. The limited "on" time of a pulser is due to its relatively high output level. Although each pulse is brief, lasting anywhere from nanoseconds to a few microseconds, these lasers typically deliver several Watts of peak power per pulse. The pulse length depends on the user's application and the amount of time the diode can operate at that level without damage. Pulsed lasers are inactive between each pulse. This "off" time allows the laser diode to cool down in preparation for another pulse.

Pulsed lasers require a trigger signal to operate. The trigger may be user-supplied or generated within the laser itself. If user-supplied, the individual will receive a maximum rate (repetition rate) at which he or she can safely trigger the pulse without damaging the laser. If the laser contains an internal trigger circuit, the repetition rate will be preset at the factory, and users need only supply power to the laser to operate it.

Modulated lasers, on the other hand, do not have a limited "on" time. They can be modulated to respond much more rapidly than pulsed lasers, although peak output power cannot match that of pulsers. Several of our laser diode modules employ one of two types of modulation: analog or TTL. Analog modulation allows users to adjust a laser's output to a desired level from less than 5% to 100% of its maximum. A DC voltage of 0 to 1 Volt generates this desired output, and this voltage can be modulated at a relatively high rate, up to 20MHz in some cases. Analog modulators attempt to follow the shape of the 0 to 1 Volt input signal with 0 to 100% laser output, limited only by how fast the modulator can respond and drive the laser.

TTL modulators emit 100% of their power when a TTL "0" (0 VDC) is input and less than 5% of their power when a TTL "1" (5 VDC) is input. Unlike analog modulated lasers, TTL modulated lasers cannot produce any level of fractional power. They are either ON or OFF. TTL modulators are designed primarily for applications requiring speed.