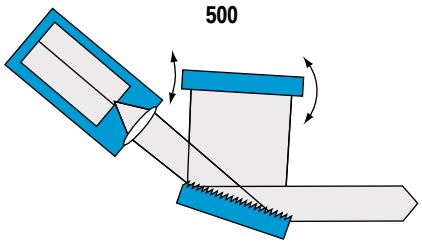
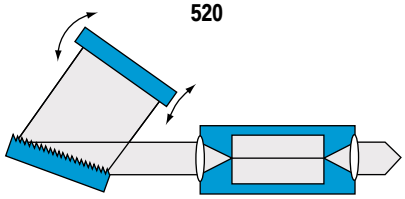
Turnkey Systems





TEC 500 / TEC-520 Lion Series Littman

The TEC 500 / TEC-520 External Cavity Diode Laser in Littman configuration is designed for moderate output power up to 100mW, narrow linewidth in the order of 500kHz and a large mode-hop free tuning range of up to 100GHz. A new high power version with more than 100mW at 780nm and 850nm is available.

The laser system consists of a diode laser, collimating optics, a diffraction grating and a tuning prism. The laser light is collimated and coupled to the diffraction grating. The first order diffraction beam is coupled to a reflection prism which makes the cavity design self-aligning. The reflecting prism feeds the laser beam back to the diffraction grating where it is finally directed back into the laser chip. The rear facet bem of the laser chip is coupled out of the laser system. The major advantages of this laser design are the large mode-hop free tuning range due to the double passing of the diffraction grating and the absolute beam direction stability.

TEC 500 / 520

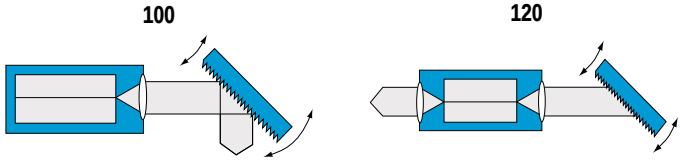
General Specification TEC500 / 520:	
Linewidth	< 1MHz, typ. 0.5MHz (50ms), < 5MHz, typ. 2MHz (20s)
Side Mode Suppression	typical 40 dB
Long Term Drift (24h)	typical 300MHz
Output Power	3mW … 100mW, depending on the actual wavelength
Coarse Tuning Range	10nm ... 100nm, depending on the actual wavelength
Fine Tuning (Mode-Hop Free / Total)	5GHz ... 100GHz / 80GHz … 200GHz
Frequency Modulation	> 1kHz @ 30GHz frequency change

Model	Wavelength Regime	Power	Tuning Total	Tuning Fine	Tuning Modehop-Free	Features
TEC-500-0635-05	630-640nm	5mW	5nm	0.4nm 300GHz	30GHz typ. 100GHz	He-Ne Laser
TEC-500-0645-03	640-650nm	3mW	5nm	0.4nm 300GHz	30GHz typ. 100GHz	
TEC-500-0655-03	650-660nm	3mW	5nm	0.4nm 300GHz	30GHz typ. 100GHz	
TEC-500-0665-03	660-670nm	3mW	5nm	0.4nm 300GHz	30GHz	
TEC-500-0675-05	670-680nm	5mW	5nm	0.4nm 300GHz	30GHz typ. 100GHz	Lithium
TEC-500-0685-05	680-690nm	5mW	5nm	0.4nm 300GHz	30GHz typ. 100GHz	
TEC-500-0740-10	735-745nm	10mW	8nm	0.4nm 200GHz	30GHz typ. 100GHz	
TEC-500-0755-10	750-760nm	10mW	8nm	0.5nm 200GHz	40GHz	
TEC-500-0765-10	760-775nm	10mW	10nm	0.5nm 200GHz	4-6GHz	Oxygen
TEC-500-0780-20	775-785nm	20mW	10nm	0.5nm 200GHz	60GHz	Rubidium
TEC-500-0780-30	775-785nm	30mW	10nm	0.5nm 200GHz	30GHz typ. 100GHz	Rubidium
TEC-520-0780-100	770-790nm	100mW	20nm	0.5nm 200GHz	30GHz typ. 100GHz	Rubidium, Opt. Cooling
TEC-500-0795-20	790-800nm	20mW	10nm	0.5nm 200GHz	30GHz typ. 100GHz	Rubidium
TEC-500-0820-20	800-830nm	20mW	20nm	0.5nm 200GHz	30GHz typ. 100GHz	
TEC-500-0850-20	840-855nm	20mW	25nm	0.4nm 300GHz	30GHz typ. 50GHz	Ceasium
TEC-520-0850-100	830-870nm	80mW	30nm	0.4nm 300GHz	30GHz typ. 100GHz	Ceasium, Opt. Cooling
TEC-500-0870-20	860-890nm	20mW	15nm	0.4nm 300GHz	30GHz typ. 50GHz	Ceasium
TEC-500-0910-20	895-925nm	20mW	40nm	0.8nm 200GHz	40GHz	Water BTX
TEC-500-0960-30	930-980nm	30mW	40nm	0.8nm 200GHz	40GHz	Water BTX
TEC-500-1020-30	1000-1040nm	30mW	40nm	0.4nm 100GHz	6-8GHz	
TEC-500-1060-30	1040-1080nm	30mW	40nm	0.4nm 100GHz	6-8GHz	Nd-YAG
TEC-500-1080-30	1070-1090nm	30mW	40nm	0.4nm 100GHz	6-8GHz	He
TEC-500-1250-03	1240-1280nm	3mW	60nm	0.6nm 100GHz	80GHz	
TEC-500-1310-05	1250-1330nm	5mW	60nm	0.6nm 100GHz	80GHz	Telecom
TEC-500-1380-03	1330-1410nm	3mW	60nm	0.6nm 100GHz	80GHz	Water-Vapour, Telecom
TEC-500-1450-03	1400-1480nm	3mW	60nm	0.6nm 100GHz	80GHz	Telecom
TEC-500-1520-05	1480-1540nm	5mW	60nm	1.0nm 120GHz	80GHz	Telecom
TEC-500-1550-10	1500-1580nm	10mW	80nm	1.0nm 120GHz	80GHz	Telecom
TEC-500-1630-03	1595-1655nm	3mW	80nm	1.0nm 120GHz	80GHz	Methane, Telecom

Tunable Laser Systems

Name	Cavity	Series	Max Power	Linewidth	Tuning Range	Mode Hop Free Tuning Range	Wavelengths Available
Lion	Littman	500/520	100mW	500kHz	5-80nm	100GHz	630-1655nm
Amplified Littman	Lion + Amplifier	420	500-1000mW	500kHz	10-40nm	30-100GHz	760-1060nm
Lynx	Littrow	120	500mW	1MHz	2-60nm	30GHz	370-422; 630-1680nm
Tiger	Littrow	300	1000mW	1MHz	8-25nm	15GHz	730-1090nm
Cougar	Littrow	200	1500mW	10GHz	5-20nm	0	630-1080nm

TEC 120 Lynx Series Littrow



The TEC 120 External Cavity Diode Laser in Littrow configuration is designed for high output power up to 500mW, narrow linewidth in the order of 1MHz and a moderate mode-hop free tuning range of up to 30GHz.

The TEC 120 Littrow Laser cavity has been designed according to the basic principles of the Littrow cavity concept. The laser system consists of a diode laser, collimating optics and a diffraction grating. Only antireflection coated diode lasers are operated in the TEC 120 laser systems. The laser light is collimated and coupled to the diffraction grating. The first order diffraction beam is directed back into the laser chip. The light of the rear facet of the laser chip is coupled out of the laser. One of the major advantages of this laser design is that it is possible to achieve much higher output power than with other types of external cavity laser systems.

TEC 100 / 120

General Specification TEC 100 / 120:	
Linewidth	< 2MHz, typ. 1MHz (50ms), < 10MHz, typ. 5MHz (20s)
Side Mode Suppression	typical 50 dB
Long Term Drift (24h)	typical 300MHz
Output Power	10mW … 300mW, depending on the actual wavelength
Coarse Tuning Range	10nm ... 100nm, depending on the actual wavelength
Fine Tuning (Mode-Hop Free / Total)	30GHz ... 50GHz / 80GHz … 200GHz
Frequency Modulation	> 10kHz @ 10GHz frequency change

Model	Wavelength Regime	Power	Tuning Range Total	Tuning Range Fine	Tuning Range Modehop-free	Features
TEC-100-0375-03	370-380nm	3mW	2nm	0.15nm 250GHz	30GHz	Atom Spectroscopy
TEC-100-0405-20	390-422nm	20mW	3nm	0.15nm 300GHz	20GHz	Atom Spectroscopy, (In, Ga, Rb, Y), Atom Cooling
TEC-100-0635-10	626-637nm	10mW	10nm	0.4nm 300GHz	30GHz	Interferometry, HeNe-Laser, Iodine Spectroscopy
TEC-100-0645-10	637-652nm	10mW	8nm	0.4nm 300GHz	30GHz	Interferometry, Iodine Spectroscopy
TEC-100-0655-10	650-660nm	10mW	8nm	0.4nm 300GHz	30GHz	Ba, Ca, H Spectroscopy, Optical Data Storage
TEC-100-0665-25	660-670nm	10mW	8nm	0.4nm 300GHz	30GHz	Ba Spectroscopy
TEC-100-0675-15	669-679nm	15mW	8nm	0.4nm 300GHz	20GHz	Li Spectroscopy
TEC-100-0685-25	680-690nm	26mW	8nm	0.4nm 300GHz	25GHz	Holography
TEC-100-0730-05	725-727nm	6mW	6nm	0.4nm 150GHz	20GHz	Ca Spectroscopy
TEC-120-0730-30	725-737nm	30mW	6nm	0.3nm 150GHz	20GHz	Ca Spectroscopy
TEC-100-0745-15	740-750nm	15mW	8nm	0.3nm 150GHz	20GHz	
TEC-120-0745-30	740-750nm	30mW	10nm	0.3nm 150GHz	20GHz	
TEC-100-0755-20	750-760nm	20mW	8nm	0.3nm 150GHz	25GHz	
TEC-120-0755-30	750-760nm	30mW	10nm	0.3nm 150GHz	25GHz	
TEC-100-0765-40	760-775nm	40mW	12nm	0.3nm 150GHz	25GHz	Kalium, Oxygen, Potassium
TEC-120-0765-100	760-775nm	100mW	12nm	0.3nm 150GHz	25GHz	
TEC-100-0780-40	774-787nm	40mW	15nm	0.3nm 150GHz	20GHz	Rubidium (D2)
TEC-100-0780-120	775-785nm	120mW	8nm	0.3nm 150GHz	20GHz	MOT, Rubidium (D2) Raman Spectroscopy
TEC-120-0780-150	775-795nm	150mW	25nm	0.3nm 150GHz	40GHz	MOT, Rubidium (D2), Raman Spectroscopy
TEC-120-0780-200	775-795nm	200mW	25nm	0.3nm 150GHz	20GHz	MOT, Rubidium (D2), Raman Spectroscopy
TEC-100-0795-50	785-800nm	50mW	18nm	0.3nm 150GHz	20GHz	Rubidium (D1)
TEC-120-0795-150	785-805nm	100mW	25nm	0.3nm 150GHz	40GHz	Rubidium (D1)
TEC-100-0810-50	800-830nm	50mW	16nm	0.3nm 150GHz	20GHz	
TEC-100-0810-80	800-830nm	100mW	16nm	0.3nm 150GHz	20GHz	
TEC-100-0830-50	815-840nm	50mW	22nm	0.3nm 150GHz	20GHz	
TEC-100-0830-100	810-843nm	100mW	22nm	0.3nm 150GHz	15GHz	Raman Spectroscopy
TEC-120-0830-150	800-843nm	150mW	22nm	0.3nm 150GHz	40GHz	Raman Spectroscopy
TEC-100-0850-55	820-885nm	55mW	35nm	0.3nm 150GHz	30GHz	Cesium Spectroscopy
TEC-100-0850-100	840-865nm	100mW	20nm	0.3nm 150GHz	15GHz	MOT, Cesium Spectroscopy
TEC-120-0850-150	830-880nm	120mW	35nm	0.3nm 150GHz	40GHz	MOT, Cesium Spectroscopy
TEC-100-0920-60	875-945nm	60mW	60nm	0.3nm 150GHz	25GHz	Cesium Spectroscopy, Water Vapor, BTX
TEC-120-0920-150	875-945nm	150mW	60nm	0.3nm 100GHz	40GHz	Cesium Spectroscopy, Water Vapor, BTX
TEC-100-0960-80	910-980nm	80mW	60nm	0.3nm 100GHz	25GHz	BTX Water Vapor
TEC-100-0960-150	920-990nm	120mW	60nm	0.3nm 100GHz	25GHz	Erbium Doped Fibres
TEC-100-0980-80	930-1000nm	80mW	60nm	0.3nm 100GHz	40GHz	Erbium Doped Fibres
TEC-100-1020-100	1000-1028nm	100mW	18nm	0.4nm 80GHz	15GHz	Testing of active Fibres
TEC-100-1060-60	1025-1080nm	60mW	50nm	0.3nm 80GHz	15GHz	Testing of active Fibres, Nd-YAG seeding
TEC-120-1060-150	1025-1080nm	150mW	50nm	0.3nm 80GHz	40GHz	Testing of active Fibres, Nd-YAG seeding
TEC-100-1080-60	1050-1105nm	60mW	40nm	0.3nm 80GHz	20GHz	He Spectroscopy
TEC-120-1080-150	1050-1105nm	100mW	40nm	0.3nm 80GHz	40GHz	He Spectroscopy
TEC-100-1260-10	1240-1310nm	10mW	50nm	0.3nm 60GHz	20GHz	Telecommunication
TEC-120-1260-010	1240-1310nm	10mW	50nm	0.3nm 60GHz	40GHz	Telecommunication
TEC-100-1310-10	1280-1330nm	10mW	50nm	0.3nm 60GHz	20GHz	Telecommunication
TEC-120-1310-010	1280-1330nm	10mW	50nm	0.3nm 60GHz	40GHz	Telecommunication
TEC-100-1380-10	1330-1410nm	10mW	50nm	0.3nm 60GHz	20GHz	Water Vapor, Argon, Telecommunication
TEC-120-1380-010	1330-1410nm	10mW	50nm	0.3nm 60GHz	40GHz	Water Vapor, Argon, Telecommunication
TEC-100-1450-10	1410-1480nm	10mW	60nm	0.3nm 50GHz	40GHz	Telecommunication
TEC-120-1450-010	1410-1480nm	10mW	60nm	0.3nm 50GHz	40GHz	Telecommunication
TEC-100-1520-10	1460-1540nm	10mW	70nm	0.3nm 40GHz	40GHz	Acetylene, Krypton, Telecommunication
TEC-120-1520-010	1460-1540nm	10mW	80nm	0.3nm 40GHz	40GHz	Acetylene, Krypton, Telecommunication
TEC-100-1550-10	1480-1590nm	10mW	80nm	0.3nm 40GHz	40GHz	Telecommunication
TEC-120-1550-010	1480-1590nm	10mW	80nm	0.3nm 40GHz	40GHz	Telecommunication
TEC-100-1630-10	1560-1660nm	10mW	50nm	0.3nm 40GHz	40GHz	Methane, Telecommunication
TEC-120-1630-010	1560-1660nm	10mW	60nm	0.3nm 40GHz	40GHz	Methane, Telecommunication
TEC-120-1680-010	1650-1710nm	10mW	60nm	0.3nm 40GHz	10GHz	Methane

TEC 300 Tiger Series Littrow

The TEC 300 External Cavity Diode Laser in Littrow configuration is designed for high output power up to 1000mW, narrow linewidth of the order of 1MHz and a moderate mode-hop free tuning range of up to 15GHz.

The TEC 300 Littrow Laser has been designed according to the basic principles of the Littrow cavity concept. The laser system consists of a diode laser, collimating optics and a diffraction grating. Only antireflection coated diode lasers are operated in the TEC 120 laser systems.

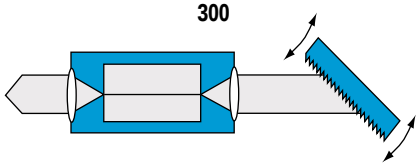
The laser light is collimated and coupled to the diffraction grating. The first order diffraction beam is directed back into the laser chip. The rear facet beam of the laser chip is coupled out. One of the major advantages of this laser design is that it is possible to achieve much higher output power than with other types of laser systems.

TEC 200 Power Littrow Series: COUGAR

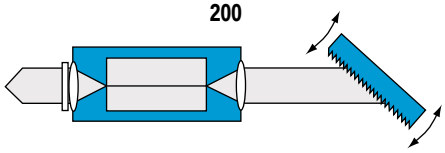
The TEC 200 External Cavity Diode Laser in Littrow configuration is designed for high output power up to 1500mW with moderate linewidth in the order of 10GHz. The laser light will be delivered via a 100µm core optical fibre. Target application is Raman Spectroscopy. Please check our downloadable data sheets.

The TEC 200 Power Littrow Laser has been designed according to the basic principles of the Littrow cavity concept. The laser system consists of a diode laser, collimating optics and a diffraction grating. The laser light is collimated and coupled to the diffraction grating. The first order diffraction beam is directed back into the laser chip. The light emitted from the rear facet is coupled is coupled into an optical fibre. One of the major advantages of this laser design is that it is possible to achieve much higher output power than with other types of laser systems.

300



200



TEC 300

General Specification TEC 300:	
Linewidth	< 2MHz, typ. 1MHz (1ms), <20MHz, typ. 10MHz (20s)
Side Mode Suppression	typical 55 dB
Long Term Drift (24h)	typical 300MHz
Output Power	> 1000mW, depending on the actual wavelength
Coarse Tuning Range	10nm ... 30nm, depending on the actual wavelength
Fine Tuning (Mode-Hop Free / Total)	5GHz ... 15GHz / 80GHz ... 100GHz
Frequency Modulation	> 1kHz @ 10GHz frequency change

TEC 200

General Specification TEC 200:	
Linewidth	< 10GHz, typ. 5GHz
Side Mode Suppression	typical 40 dB
Long Term Drift (24h)	typical 0.1nm
Output Power	100mW ... 1500mW, depending on the actual wavelength
Coarse Tuning Range	10nm ... 30nm, depending on the actual wavelength
Fine Tuning (Total)	80GHz ... 200GHz (with piezo option)
Frequency Modulation	> 1kHz @ 20GHz frequency change

TEC 300

Model	Wavelength Regime	Power	Tuning Total	Tuning Fine	Tuning Modehop-Free	Features
TEC-300-0735-0500	730-740nm	500mW	8nm	0.3nm 200GHz	4-6GHz typ. 15GHz	
TEC-300-0765-0500	750-770nm	500mW	15nm	0.5nm 200GHz	4-6GHz typ. 15GHz	Oxygen Potassium
TEC-300-0780-0500	765-785nm	500mW	15nm	0.3nm 200GHz	4-6GHz typ. 15GHz	Rubidium
TEC-300-0780-1000	765-785nm	1000mW	15nm	0.3nm 200GHz	4-6GHz typ. 15GHz	Rubidium MOT
TEC-300-0785-0500	775-790nm	500mW	10nm	0.3nm 200GHz	4-6GHz typ. 15GHz	Raman
TEC-300-0795-0500	785-810nm	500mW	15nm	0.3nm 200GHz	4-6GHz typ. 15GHz	Rubidium
TEC-300-0830-0500	820-840nm	500mW	20nm	0.3nm 200GHz	4-6GHz typ. 15GHz	Raman
TEC-300-0850-0500	840-860nm	500mW	20nm	0.3nm 200GHz	4-6GHz typ. 15GHz	Caesium
TEC-300-0960-0500	930-990nm	500mW	50nm	0.3nm 200GHz	4-6GHz typ. 15GHz	Water BTX
TEC-300-1010-0500	990-1040nm	500mW	50nm	0.3nm 300GHz	4-6GHz typ. 15GHz	Water BTX
TEC-300-1060-0500	1030-1070nm	500mW	25nm	0.3nm 300GHz	4-6GHz typ. 15GHz	YAG Seeding
TEC-300-1060-1000	1030-1070nm	1000mW	25nm	0.3nm 300GHz	4-6GHz typ. 15GHz YAG	Seeding
TEC-300-1080-0500	1050-1090nm	500mW	25nm	0.3nm 300GHz	4-6GHz typ. 15GHz	Helium

TEC 300

Model	Wavelength Regime	Power	Tuning Total	Tuning Fine	Features
TEC-200-0635-100	630-640nm	100mW	5nm	0.4nm 200GHz	He-Ne Laser
TEC-200-0645-100	640-650nm	100mW	5nm	0.4nm 200GHz	
TEC-200-0655-150	650-660nm	150mW	5nm	0.4nm 200GHz	
TEC-200-0685-200	680-690nm	200mW	5nm	0.4nm 200GHz	Raman
TEC-200-0740-300	735-745nm	300mW	5nm	0.4nm 200GHz	
TEC-200-0760-500	755-765nm	500mW	5nm	0.4nm 200GHz	
TEC-200-0785-1000	780-795nm	1000mW	15nm	0.4nm 200GHz	Raman
TEC-200-0800-1000	795-810nm	1000mW	15nm	0.5nm 200GHz	
TEC-200-0830-1000	820-840nm	1000mW	15nm	0.5nm 200GHz	Raman
TEC-200-0850-1000	840-860nm	1000mW	15nm	0.5nm 200GHz	
TEC-200-0940-1000	930-945nm	1000mW	15nm	0.5nm 200GHz	
TEC-200-0980-1000	965-985nm	1000mW	15nm	0.5nm 200GHz	
TEC-200-1060-1000	1040-1080nm	1000mW	20nm	0.5nm 200GHz	

TEC 420 Amplified Littman / Metcalf Series:

The TEC 420 Amplified Littman / Metcalf Laser System is consists of a TEC-500 Littman / Metcalf master laser system which is amplified by a TEC 400 tapered amplifier stage up to 500 .. 1000mW. It takes advantage of the beam-walk free wavelength tuning of the Littman / Metcalf design which is required for a stable amplification stage. The complete system is customer friendly and easy to handle. Please check our downloadable data sheets.

The TEC 420 Tapered Amplifier laser is designed to be used with a Littman / Metcalf master laser. The emitted light is decoupled via a 60dB isolator before entering the tapered amplifier. The tapered amplifier diode is antireflection coated on both the input and output facets. A two stage collimation optic guarantees an almost diffraction limited beam quality characterised by an $M^2 < 1.7$.

TEC 420

General Specifications TEC420:	
Output Power	500mW .. 1000mW
Wavelength	735nm .. 1080nm
Linewidth (50ms)	< 0.5MHz, typ. 0.3MHz
Linewidth (20s)	<5MHz, typ. 2MHz
Long Term Drift (24h)	typical 300MHz
Side Mode Suppression	> 40dB, typical 45 dB
Beam Waist (2w)	2.5 x 2.5mm .. 3.0 x 1.5mm
Beam Divergence	< 2mrad
Beam Quality M^2	$M^2 < 1.7$
Coarse Tuning Range	10nm .. 40nm
Fine Tuning (Total / Mode-Hop-Free)	250GHz / 30GHz .. 100GHz
Polarisation	Linearly > 100:1
Laser Head Dimensions	210 x 100 x 307mm

Model	Wavelength Regime	Power	Tuning Total	Tuning Fine	Tuning Mode-hop Free	Features
TEC-420-0735-500	730-740nm	500mW	8nm	250GHz	30GHz	
TEC-420-0765-500	760-770nm	500mW	8nm	250GHz	30GHz	Oxygen Potassium
TEC-420-0780-500	770-790nm	500mW	10nm	250GHz	60GHz	Rubidium
TEC-420-0780-1000	770-790nm	1000mW	10nm	250GHz	60GHz	Rubidium
TEC-420-0795-500	790-810nm	500mW	10nm	250GHz	30GHz	Rubidium
TEC-420-0830-500	820-840nm	500mW	15nm	200GHz	30GHz	Raman
TEC-420-0850-500	840-860nm	500mW	15nm	200GHz	60GHz	Caesium
TEC-420-0935-500	910-940nm	500mW	20nm	200GHz	60GHz	Water BTX
TEC-420-0960-500	950-980nm	500mW	20nm	200GHz	60GHz	Water BTX
TEC-420-1010-500	990-1040nm	500mW	25nm	200GHz	60GHz	YAG Seeding
TEC-420-1060-500	1040-1080nm	500mW	25nm	200GHz	60GHz	YAG Seeding
TEC-420-1060-1000	1040-1080nm	1000mW	25nm	200GHz	60GHz	YAG Seeding
TEC-420-1080-500	1060-1100nm	500mW	25nm	200GHz	30GHz	Helium

MLD1000

Tunable Laser Diode Systems

MLD1000

The MLD 1000 is a modular laser driver system designed for use with the TEC500 and TEC100 external cavity laser diode system. Every system ordered from **Laser 2000** comes complete with AR coated Laser, Cavity (TEC 100 or TEC 500) and MLD 1000 fitted with the Laser controller and piezo amplifier module. The Ramp generator module may be purchased as an additional item. Other options include active stabilisation, BiasT and analogue modulation.

Laser Controller
This module allows for adjustment of the laser diode drive current and the setting of the cavity temperature by means of a built in Peltier effect temperature controller. Current limits as well as desired values can be set-up using the front panel controls. Connection to the laser cavity is achieved by 2 off 9 pin D-sub connectors. An additional BNC allows the end user access to the rear-facet monitor photodiode signal.

Piezo Amplifier
This module allows the end-user to fine-tune the laser wavelength using the piezo actuator built into the laser cavity. Tuning is achieved with low noise whilst providing protection to the piezo from damage caused by excessive voltage.

Ramp Generator
This module allows the piezo extension to be modulated at one of three user selectable ramp frequencies (1Hz, 100Hz and 1kHz). This has the effect of modulating the centre wavelength output by the system. The modulation amplitude is defined by the maximum travel of the piezo element. As a result, laser frequency modulation of up to ±100GHz may be achieved.

Power Supply
The MLD1000 operates from 240V single phase (mains) voltage and meets all current CE regulations.

Model	Centre Wavelength Region (nm)	Power (mW)	Tuning Total (nm)	Tuning Fine (nm / GHz)	Tuning Mode-hop-free (GHz)
TEC-500-0405-03	399-415	3	> 2	0.15 / 250	> 10
TEC-500-0635-05	630-640	5	> 5	0.4 / 300	> 30 (typ. 100)
TEC-500-0645-03	640-650	3	> 5	0.4 / 300	> 30 (typ. 100)
TEC-500-0655-03	650-660	3	> 5	0.4 / 300	> 30 (typ. 100)
TEC-500-0665-03	660-670	3	> 5	0.4 / 300	> 30
TEC-500-0675-05	670-680	5	> 5	0.4 / 300	> 30 (typ. 100)
TEC-500-0685-05	680-690	5	> 5	0.4 / 300	> 30 (typ. 100)
TEC-500-0740-10	735-745	10	> 8	0.4 / 200	> 30 (typ. 100)
TEC-500-0755-10	750-760	10	> 8	0.5 / 200	> 40
TEC-500-0765-10	760-775	10	> 10	0.5 / 200	> 4-6
TEC-500-0780-20	775-785	20	> 10	0.5 / 200	> 60
TEC-500-0780-30	775-785	30	> 10	0.5 / 200	> 30 (typ. 100)
TEC-500-0795-30	790-800	30	> 10	0.5 / 200	> 30 (typ. 100)
TEC-500-0820-20	800-830	20	> 20	0.5 / 200	> 30 (typ. 100)
TEC-500-0850-20	840-855	20	> 25	0.4 / 300	> 30 (typ. 100)
TEC-500-0870-20	860-890	20	> 15	0.4 / 300	> 30 (typ. 100)
TEC-500-0910-20	890-920	20	> 40	0.8 / 200	> 40
TEC-500-0960-30	930-980	30	> 40	0.8 / 200	> 40
TEC-500-1020-30	1000-1040	30	> 40	0.4 / 100	> 6-8
TEC-500-1060-30	1040-1080	30	> 40	0.4 / 100	> 6-8
TEC-500-1080-30	1070-1090	30	> 40	0.4 / 100	> 6-8
TEC-500-1260-03	1240-1280	3	> 60	0.6 / 100	> 80
TEC-500-1310-03	1250-1330	3	> 60	0.6 / 100	> 80
TEC-500-1380-03	1330-1410	3	> 60	0.6 / 100	> 80
TEC-500-1450-03	1400-1480	3	> 60	0.6 / 100	> 80
TEC-500-1520-03	1480-1540	3	> 60	1.0 / 120	> 80
TEC-500-1550-05	1500-1580	5	> 80	1.0 / 120	> 80
TEC-500-1630-03	1595-1655	3	> 80	1.0 / 120	> 80

Model	Centre Wavelength Region (nm)	Power (mW)	Tuning Range Total (nm)	Tuning Range Fine (nm / GHz)	Tuning Range Mode-hop-free (GHz)
TEC-100-0405-10	395-415	15	> 2	0.15 / 250	2-6
TEC-100-0635-10	626-637	10	> 8	0.4 / 300	6-8
TEC-100-0645-10	637-652	10	> 8	0.4 / 300	6-8
TEC-100-0655-10	650-660	10	> 8	0.4 / 300	4
TEC-100-0665-10	660-670	10	> 8	0.4 / 300	4
TEC-100-0675-10	670-680	10	> 10	0.4 / 300	6-8
TEC-100-0685-20	680-690	20	> 8	0.4 / 300	6-8
TEC-100-0690-10	685-695	10	> 8	0.4 / 300	6-8
TEC-100-0730-05	720-740	4	> 8	0.3 / 150	4
TEC-100-0755-40	750-760	40	> 5	0.3 / 150	6-8
TEC-100-0765-40	760-775	40	> 12	0.3 / 150	4
TEC-100-0780-40	774-787	40	> 15	0.3 / 150	6-8
TEC-100-0780-100	775-785	100	> 12	0.3 / 150	4
TEC-100-0795-50	785-800	50	> 18	0.3 / 150	3-6
TEC-100-0810-50	800-830	50	> 16	0.3 / 150	2-4
TEC-100-0810-100	800-830	100	> 16	0.3 / 150	2-4
TEC-100-0830-50	800-835	50	> 20	0.3 / 150	4-15
TEC-100-0830-100	820-840	100	> 20	0.3 / 150	4
TEC-100-0850-50	840-860	50	> 20	0.3 / 150	4
TEC-100-0850-100	840-860	100	> 20	0.3 / 150	4
TEC-100-0870-50	860-880	50	> 20	0.3 / 150	4-8
TEC-100-0910-50	900-920	40	> 15	0.3 / 100	3
TEC-100-0940-80	900-960	80	> 60	0.3 / 100	6-10
TEC-100-0960-80	940-980	80	> 60	0.3 / 100	6-10
TEC-100-1020-60	1000-1035	60	> 40	0.4 / 70	2-6
TEC-100-1060-60	1035-1075	60	> 40	0.3 / 70	4-8
TEC-100-1080-50	1075-1090	60	> 40	0.3 / 70	4-8
TEC-100-1260-10	1240-1280	10	> 40	0.3 / 60	4-8
TEC-100-1310-10	1280-1330	10	> 50	0.3 / 60	20
TEC-100-1380-10	1330-1410	10	> 60	0.5 / 60	20
TEC-100-1450-10	1410-1480	10	> 60	0.3 / 50	20
TEC-100-1520-10	1480-1540	10	> 70	0.3 / 40	30
TEC-100-1550-10	1500-1580	10	> 70	0.3 / 40	30
TEC-100-1630-05	1560-1660	5	> 70	0.3 / 40	10

Laser Controller

Adjustment

Laser Current	0 to ±200mA (±500mA)
TEC Current	0 to ±2A
Temperature	10 to 30°C

Connectors

Laser Current	9 Pin Sub-D Connector
Temperature	9 Pin Sub-D Connector

Output

Monitor Current	BNC, 0 to ±5V

Piezo Amplifier

Adjustment

Piezo Voltage	0 to 100V

Connector

Piezo Voltage:	-20 to 120V

Input

Piezo Control:	BNC, 0 to 10V

Ramp Generator

Adjustment

Modulation Frequency	1Hz, 100Hz, 1kHz
Modulation Amplitude	0 to ±60V

Output

Sync	BNC, TTL-Signal

Broad Area Diodes

Laser 2000 can now offer a range of AR coated broad area diodes centred at 740, 765, 790, 810, 870, 940 and 970nm with powers of up to 3W.

AR Coatings

Use of an AR coated laser diode in an external cavity system greatly increases the wavelength range that the laser may be tuned over. Using a high performance coating, the laser may be tuned over the entire gain bandwidth of the laser diode. **Laser 2000** AR coated diodes use coatings consisting of multiple dielectric layers. This produces coatings with reflectivity of typically R<8x10^{-5}% at any point over the gain bandwidth of the laser diode. The specified performance is R<5x10^{-4}%. Furthermore, the coating process has been developed to enable multiple diodes to be coated in volume thus reducing individual piece costs.The laser diode package is re-sealed after the coating operation.

Lifetime:
Using the accelerated aging method, a batch of 25 AR coated 5mW 670nm laser diodes was tested at 90°C. Under reasonable power conditions (power outputs of 10-15mW per diode), no reduction of the lifetime was found to occur with the AR coated devices when compared with standard devices. For standard operating conditions, more than 10,000 hr lifetimes have been achieved with AR coated devices when operated with an injection current of 50mA.

PDL 800-B

Picosecond Laser Diode Driver

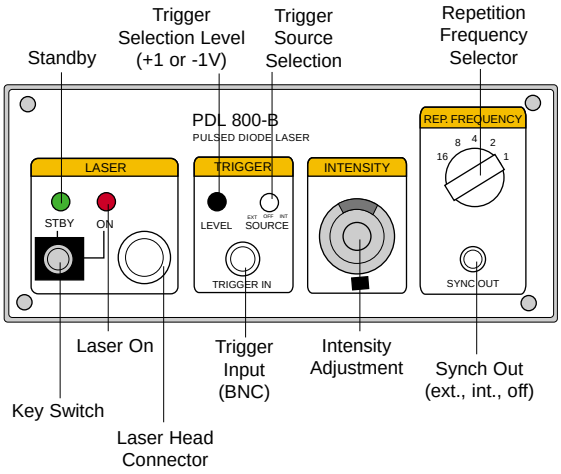
PDL 800-B

- *Short laser pulses down to 50 ps (FWHM)*
- *Repetition rate from single shot to 40 MHz (optional 64 or 80 MHz)*
- *Laser power and pulse width adjustable via driver unit*
- *Laser heads for wavelengths between 390 nm and 1550 nm*
- *LED heads from 370 nm to 600 nm*

Applications

- *Time-resolved fluorescence spectroscopy*
- *Optical time domain reflectometry (OTDR)*
- *Fibre optic distributed temperature sensing*
- *Test and measurement of detectors and optical fibres*
- *Optical tomography of biological tissue*

The picosecond diode laser PDL 800-B is the newly designed driver for the new LDH 400 and LDH 440, violet picosecond pulsed diode laser head (390 to 415 nm and 435 to 445 nm). The driver also works together with all red diode laser heads (635 to 1550 nm) as well with the pulsed LEDs from 370 nm to 600 nm.
The dedicated laser heads produce light pulses as short as 50 ps (FWHM) at repetition rates from single shot to 40 MHz. The driver unit features an easy to use adjustment to control the laser power and the laser pulse width. Depending on the laser diode head, peak powers up to 1 W can be emitted. Laser heads are available for wavelengths between 390 nm and 1550 nm. A simple change of the laser head allows for quick changes of the wavelength. The laser heads, come with collimating optics and can be fitted with single or multimode optical fibres. The internal pulse clock runs at a standard base frequency of 40 MHz (64 or 80 MHz are possible with red diode laser heads on request) which can be divided by 2, 4, 8 and 16. Alternatively the laser pulses can be triggered through an external sync input. This way the PDL 800-B can be synchronised with other instruments over the full frequency range. A permanently active sync output allows the PDL 800-B to trigger other devices. The internal power supply can provide supply voltages for external components such as PMTs or SPADs.



Picosecond Diode Laser Heads

Wavelength nm (+/-10	Power Adjust = Low (Narrow Pulse) Pulse FWHM ps	Average Power mW (@80MHz)	Power Adjust = High (Wide Pulse) Pulse FWHM ps	Average Power mW (@80MHz)
635	< 90	1.0	< 300	6.0
650	< 70	0.7	< 700	8.0
660	< 70	1.0	< 400	8.0
670	< 70	1.0	< 300	2.2
685	< 70	1.4	< 400	8.0
750	< 70	0.2	< 300	0.7
780	< 70	0.8	< 300	5.0
810	< 100	0.7	< 500	6.0
830	< 100	1.0	< 400	5.0
850	< 90	0.6	< 300	4.0
870	< 100	0.7	< 500	4.0
880	< 90	0.5	< 300	4.0
905	< 150	1.0	< 400	5.0
980	< 90	0.4	< 600	3.0
1060	< 150	0.5	< 750	4.0
1300	on request			
1550	on request			

All measurements may be subject to a 10% calibration error.

The two power adjustment levels specified here refer to the same laser head. The 'Low' adjustment is the best choice for shortest pulses, the 'High' adjustment is the used to achieve highest pulse power at moderate pulse length.

Selected heads with pulse widths as low as 50 ps are available for certain wavelengths on request. Other wavelengths or wavelength selection can also be provided on special demand.

All laser heads are supplied with an integrated collimator. Optionally they can be fitted with monomode and multimode optical fibres through appropriate fibre couplers.

Note: These laser heads can only be driven by the PDL 800 or PDL 800-B driver units.

Specifications		
Internal Clock		
Master frequency		crystal locked at 40 MHz
		(64 or 80 MHz on request)
		stepwise dividable by
		2,4,8 and 16
External Trigger Input		
Max. levels		-5 V to +5 V
Trigger level		-1 V to +1 V, negative slope
Required pulse width		> 3 ns
Frequency range		10 Hz to 80 MHz
Internal impedance		50 Ohms
Connector		BNC socket
Sync Output		
Amplitude		- 800 mV (according to the NIM - standard)
Pulse width		5 ns
Internal impedance		50 Ohms
Connector		SMA socket
D C Supply for External Components		
+/- 5 V		600 mA
+/- 12 V		200 mA
Connector		5 pin miniature socket
Power Supply		
Line Voltage		110/117 or 220/240 V AC
		50 to 60 Hz
Power Consumption		max. 60 VA
Dimensions		
Base Unit:	Width:	237 mm
	Depth:	310 mm
	Height:	97 mm

MDL 300

2GHz Modulated Laser Diode

MDL 300

- ***Linear modulation, any waveform***
- ***Modulation frequency up to 2 GHz***
- ***Wavelengths from 400 to 1550 nm***
- ***5..20 mW peak power***
- ***3..10 mW average power***
- ***Adjustable modulation depth***
- ***External Bias control / LF modulation***
- ***Internal sine-wave oscillator (6 frequencies)***

Applications

- ***Phase Fluorometry***
- ***Optical Tomography***
- ***Testing and analysis of optoelectronic components***
- ***Fibre optic communications***

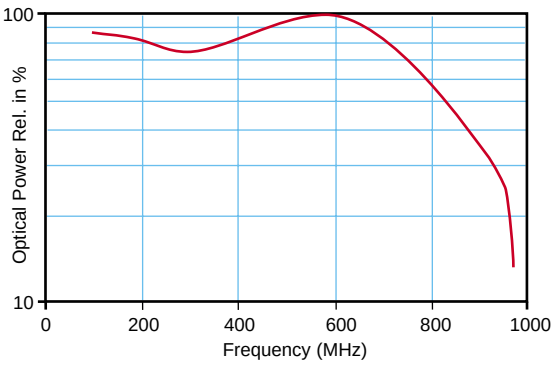
The modulated diode laser driver MDL 300 is designed to produce laser light up to 2 GHz modulation frequency with its interchangeable laser heads. The device provides an ideal ultra fast excitation source for phase modulation fluorescence lifetime measurements in a compact setup. The MDL 300 consists of a controlling generator box and separate laser heads. The laser heads are available from 400 nm to 1500 nm and offer a modulation bandwidth of 500 MHz to 2 GHz dependent on the wavelength. These laser heads come with collimator optics and can be fitted with single or multimode optical fibres. The MDL 300 is the analog counterpart of the PDL 800-B. Like the picosecond diode laser PDL 800 it supports a variety of wavelengths through changeable laser heads in compact housings. Separate SMA modulation inputs allow RF and DC/LF modulation independently.

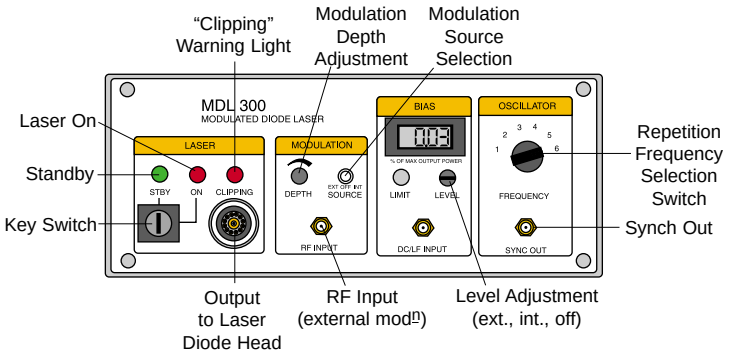
Additionally available are pulsed, fast switched and high power pulsed diode lasers and < 1 ns pulsed LEDs (370 - 600 nm). Please call for detailed information and data sheets. OEM modules of all products are available on request.

Available Laser Heads

Wavelength (+/- 10 nm)	max.CW Power (mW)	f max (-3 dB) (MHz)	f max (- 10 dB) (MHz)
400	3	600	950
635	5	700	500
655	5	800	1600
670	5	800	1700
780	10	800	1600
808	5	500	1000
850	10	800	1800
905	8	900	2000
980	10	1000	2200
1300	3	1000	2400
1500	5	1000	2000

MDL frequency characteristic with 400nm laser head





Specifications	
Internal Clock	
6 Sine frequencies	250 kHz, 1 MHz, 5 MHz 25 MHz, 100 MHz, 250 MHz
External RF Input	
Levels	Vss typ. 50 mV max. 500 mV
Impedance	dynamic 50 Ohms 200 Ohms for DC
Frequency range	100 kHz up to 2 GHz depending on used laser head
Connector	SMA female
External DC/LF Input	
Voltage level	Vss max.0 ...+5 V
Impedance	typ. 10 kOhms for DC 200 Ohms for DC
Frequency range	DC...>=1 kHz depending on used laser head
Connector	SMA female
Sync Output	
Amplitude	Vsstyp. 1V
Impedance	50 Ohms
Connector	SMA female
Power Supply	
Line Voltage	110/117 or 220/240 V AC 50 to 60 Hz
Power consumption	max. 45 VA
Dimensions	
Base Unit	
Width	237 mm
Depth	310 mm
Height	97 mm
Laser Head (without peltier cooling)	
Diameter--	25mm
Length:with collimator-	76 mm
with fibre coupler-	100 mm
Laser head (with peltier cooling)	see layout
Length:	110 mm
Width:	75 mm
Height:	60 mm

FSL 500

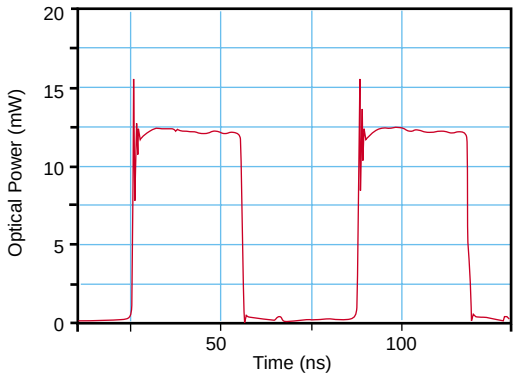
Fast Switched Laser Diode

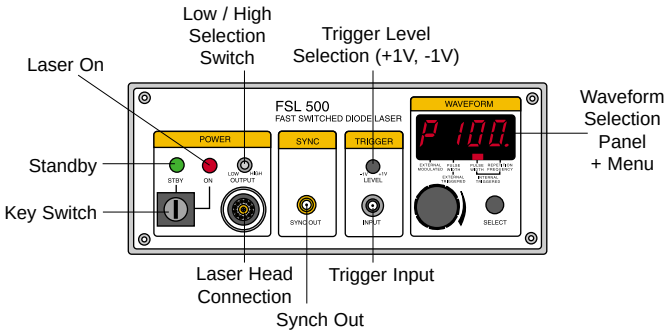
FSL 500

- ***Pulse width adjustable between 3 ns and 100 ns***
- ***Ultra short rise/fall time approx. 1 ns***
- ***Arbitrary binary signal patterns by external triggering***
- ***Laser heads for wavelengths from 390 nm to 1550 nm***
- ***Repetition rate from single shot to 48 MHz***
- ***Peak power up to 50 mW (dep. on wavelength)***
- ***'On' power level adjustable between 30 % and full power***

Applications

- ***Time-response characterisation of opto-electronic devices***
- ***Semiconductor device testing***
- ***Printing industry (computer-to-plate technology CTP)***
- ***Optical data storage***
- ***Luminescence Excitation***





The FSL 500 consists of a common control unit and interchangeable laser heads. The control unit contains the power supply, an internal pulse generator and a driver stage that allows control of the duration of the laser pulse regardless of the selected amplitude. The driver stage can be operated in three basic modes: internal, slope and level triggered. In both internal and slope triggered mode the pulse width is controlled by the front panel settings. In internal mode the driver operates with one of five fixed frequencies (f). The range is from f to f/16, where f is 16 MHz, 32 MHz or 48 MHz, with adjustable laser-on duration up to > 100 ns. In the slope triggered mode the laser pulse is fired by the falling edge of an external electrical input signal. In the level trigger mode the optical output follows an arbitrary signal pattern of a trigger input, provided that there is an off-time larger than 20 ns between two pulses.

It is possible to select a lower laser pulse amplitude reduced to 30 % of the maximum power. Laser heads are available with wavelengths from 390 nm up to 1550 nm. Since the laser diode is the critical element, the rise-time, fall-time and overshoot are wavelength dependent. The table below shows typical values for the available wavelengths.The laser heads (also available with peltier cooling) come with collimator optics and can be fitted to mono- or multimode optical fibres.

FSL 500 Laser Head Specifications

Wavelength nm (+/-10)	Max. Power mW	Rise Time ns	Fall Time ns	Overshoot % of Pmax
635	12	0.25	1.2	< 8
650	12	< 1	1	30
660	20	1.5	1.2	20
670	10	0.1	1.2	15
780	30	0.1	1.3	20
905	15	0.5	1.5	10
980	30	0.2	1.2	10
1060	20	1.3	1.6	15
1310	10	0.15	1.5	20
1550	20	0.6	< 1	< 8

All measurements may be subject to a 10% calibration error.

All laser heads are supplied with an integrated collimator. Optionally for most wavelength a monomode and multimode optical fibres can be fitted through appropriate fibre couplers.

Note: These laser heads can only be driven by the FSL 500 driver units.

Specifications	
Internal Clock	
Master frequency (f)	crystal locked at 48 MHz stepwise dividable by 2,4,8 and 16 alternatively main frequencies 32 MHz or 16 MHz on request
Pulse width	3 - 100 ns
Pulse gap	> 20 ns
External Trigger Input	Mode "level" trigger high level means laser on
Frequency range	DC to 50 MHz
Pulse width	3 - 100 ns
Max. levels	-5 V to +5 V
Trigger level	-1 V to +1 V, positive slope
Impedance	50 Ohms
Connector	BNC socket
External Trigger Input	Mode "slope" trigger positive slope triggers laser
Frequency range	DC to 50 MHz
Pulse width	3 ns to cw
Max. levels	-5 V to +5 V
Trigger level	-1 V to +1 V, positive slope
Impedance	50 Ohms
Connector	BNC socket
Sync Output	
Amplitude	-800 mV (NIM)
Pulse width	5 ns
Delay from falling edge to laser	ca. 50 ns, jitter < 0.2 ns
Impedance	50 Ohms
Connector	SMA socket
Power Supply	
Line Voltage	110/117 or 220/240 V AC 50 to 60 Hz
Power Consumption	max. 40 VA
Dimensions	Base Unit:
Width	237 mm
Depth	310 mm
Height	97 mm

LDH 400

Violet Heads

LDH 400

- ***Wavelengths between 395 nm and 415 nm***
- ***Ultra short laser pulses down to 50 ps (FWHM)***
- ***Peak power up to 400 mW***
- ***Repetition rate from single shot to 40 MHz***

Applications

- ***Time-resolved fluorescence spectroscopy***
- ***Biochemical analytics***
- ***Time response characterisation of opto-electronic devices***
- ***Semiconductor luminescence spectroscopy***
- ***Optical time domain reflectometry (OTDR)***

The blue picosecond diode laser head LDH 400 is designed to produce light pulses as short as 50 ps (FWHM) at repetition rates from single shot to 40 MHz. Peak powers up to 400 mW can be emitted. With pulse durations on the order of 50 ps, these pulsed diode lasers perfectly match the time resolution of mainstream detectors, yet at a price ten times lower than that of commonly used Ti:Sa or Argon ion lasers. With the introduction of the LDH 400 together with the PDL 800-B driving unit **Laser 2000** meets an urgent demand for compact and affordable excitation sources in the shorter wavelength range. In the past, the common sources in this range were either nanosecond flash lamps with low repetition rate or expensive and bulky frequency doubled Ti:Sa lasers. Both require extensive maintenance and considerable experience to run in daily work. As in the red and infrared range, the new pulsed diode laser sources offer the benefits of cheap and compact integrated turn-key systems together with the high repetition rates desired for fast Time-Correlated Single Photon Counting (TCSPC). These features open the door for entirely new routine applications beyond the research lab, e.g. in bioanalytics, biochemistry, genetics, semiconductor characterisation and quality control.

The system consists of a dedicated driver box and interchangeable laser heads. Laser heads are available for wavelengths between 395 and 415 nm. The laser heads come with collimator optics and can be fitted with optical fibres.

The internal pulse clock of the driver runs at a maximum frequency of 40MHz and can be divided by 2, 4, 8 and 16. Alternatively the laser pulses can be triggered through an external sync input, the trigger frequency can then go from single shot to 40 MHz. This way the laser system can be synchronised with other instruments over the full frequency range. A sync output allows the laser driver to trigger other devices such as the TimeHarp-series TCSPC boards.

LDH 440

Blue Heads

LDH 440

- ***Wavelengths between 435 nm and 445 nm***
- ***Ultra short laser pulses down to 70 ps (FWHM)***
- ***Peak power up to 150 mW***
- ***Repetition rate from single shot to 40 MHz***

The true blue picosecond diode laser head LDH 440 is designed to produce light pulses as short as 70 ps (FWHM) at repetition rates from single shot to 40 MHz. Peak powers up to 150 mW can be emitted. With pulse durations of 70 ps, these pulsed diode lasers perfectly match the time resolution of mainstream detectors, yet at a price ten times lower than that of commonly used Ti:Sa or Argon ion lasers. With the introduction of the LDH 440 together with the PDL 800-B driving unit **Laser 2000** meets an urgent demand for compact and affordable excitation sources in the shorter wavelength range. In the past, the common sources in this range were either nanosecond flash lamps with low repetition rate or expensive and bulky frequency doubled Ti:Sa lasers. Both require extensive maintenance and considerable experience to run in daily work. As in the red and infrared range, the new pulsed diode laser sources offer the benefits of low cost and compact integrated turn-key systems together with the high repetition rates desired for fast Time-Correlated Single Photon Counting (TCSPC). These features open the door for entirely new routine applications beyond the research lab, e.g. in bioanalytics, biochemistry, genetics, high throughput screening, semiconductor characterisation and quality control.

The system consists of a dedicated driver box and interchangeable laser heads. Laser heads are available for wavelengths between 435 and 445 nm. The laser heads come with collimator optics and can be fitted with optical fibres.

The internal pulse clock of the driver runs at a maximum frequency of 40MHz and can be divided by 2, 4, 8 and 16. Alternatively the laser pulses can be triggered through an external sync input, the trigger frequency can then go from single shot to 40 MHz. This way the laser system can be synchronised with other instruments over the full frequency range. A sync output allows the laser driver to trigger other devices such as the TimeHarp-series TCSPC boards.

Specifications	LDH 400	LDH 440
Wavelength		
Centre wavelength	typ. 405 nm ± 10 nm selection between 392 and 417 nm ± 3 nm on request	typ. 440 nm ± 5 nm selection between 435 and 445 nm ± 3 nm on request
Spectral width	approx. 3 nm	
Pulse parameters		
Typical pulse width	less than 70 ps on selection down to 50 ps	
Typical peak power	160 mW on selection up to 400 mW	100 mW on selection up to 150 mW
Beam Parameters		
Optics focus length	f' = 4.5 mm	
Numerical aperture	0.55	
Typical divergence (with optics)	Theta parallel 0.32 Theta perpendicular 0.11	
Cooling		
Peltier cooled		
Accuracy	better than 1°K	
Power stability		
Pulse to pulse 3 % Peak to peak	1 % RMS	
Dimensions		
Laser Head:	See layout	
Length-	110 mm	
Width-	75 mm	
Height-	60 mm Four additional tapped holes for mounting. Tapped with M6 threads. Two per polarisation plane.	

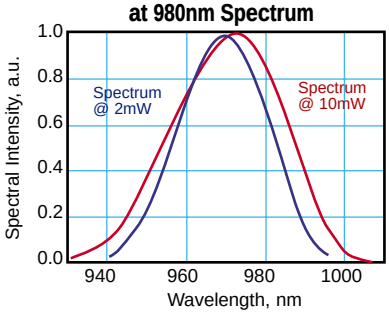
Bench top Superluminescent Diodes (from 675nm to 1610nm)

OLSLD Series

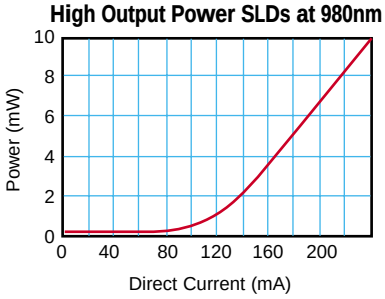
- ***High power (up to 20mW)***
- ***Broad spectral width***
- ***Overheating warning***
- ***EMC protection***

These bench top superluminescent diodes have flat and low rippled spectrum and cover a wide spectral range (from 675nm to 1610nm). The devices feature high power, excellent stability of output wavelength and EMC protection.

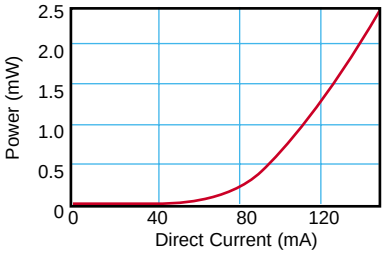
High (10mW) / Medium (2mW) Power SLDs at 980nm Spectrum



High Output Power SLDs at 980nm



Medium Output Power SLDs at 980nm



Ordering Information

OLSLD - [Wavelength Series] - [Power Level] - [Connector Type (optional)]

- [Power Level]: LP, LP1, MP, MP1, MP2, MP3, HP, HP1, HP2, HP3
- [Wavelength Series]: 680, 820, 980, 1300, 1550, (for 1550-MP/HP, please specify the peak wavelength)

Benchtop Superluminescent Diodes

Ordering Code	Centre Wavelength (nm)	Tolerance (nm)	Spectral Bandwidth Min. (nm)	Output Power (mW)
OLSLD-680-MP	680	-	7.5	1
OLSLD-680-HP1	680	-	7	5
OLSLD-680-HP2	680	-	7	10
OLSLD-820-MP1	820	780-860	15	0.5
OLSLD-820-MP2	820	780-860	15	1
OLSLD-820-MP3	820	780-860	15	2
OLSLD-820-MP	830	780-860	45	1.25
OLSLD-820-HP1	830	800-860	14	10
OLSLD-820-HP2	830	800-860	14	20
OLSLD-820-HP	835	800-860	45	7.5
OLSLD-980-MP	950	-	70	1
OLSLD-980-HP	950	-	70	3
OLSLD-980-HP1	950	-	70	7
OLSLD-980-MP1	975	960-990	25	2
OLSLD-980-HP2	975	960-990	30	10
OLSLD-980-HP3	975	960-990	30	20
OLSLD-1300-MP1	1300	1270-1330	30	0.5
OLSLD-1300-MP2	1300	1270-1330	30	1
OLSLD-1300-MP3	1300	1270-1330	30	2
OLSLD-1300-HP1	1300	1280-1330	30	5
OLSLD-1300-HP2	1300	1280-1330	30	10
OLSLD-1500-LP	1450	1430-1470	60	0.2
OLSLD-1500-LP1	1560	1540-1580	80	0.2
OLSLD-1500-MP1	1550	1440-1610	40	0.5
OLSLD-1500-MP2	1550	1440-1610	40	1
OLSLD-1500-MP3	1550	1440-1610	40	2
OLSLD-1500-HP	1550	1440-1610	40	5

Environment		Controls and Monitoring		Output	
Operating Temperature Range	-10°C to 70°C	Displays	Optical Output Power	Output Fibre	SMF-28
Storage Temperature	-30°C to 70°C	Controls	Power Adjustment, Keylock switch, Optical Output Power	Output Connector	FC/APC
Power Supply	110/230V 50/60Hz	Alarms	Pump Overheating Warning	Computer Interface	RS232 (Optional)

Erbium Micro Fibre ASE Module

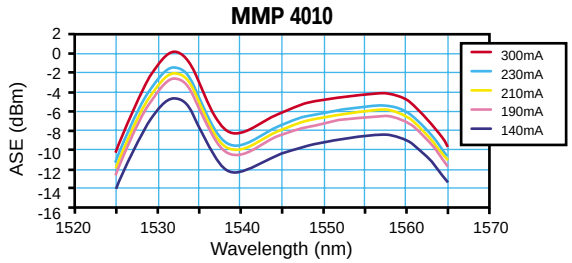
MMP-4010

- *1536 - 1565nm*
- *7, 10 or 13 dBm*
- *Microprocessor control*
- *Monitoring electronics*
- *Telcordia compliant*

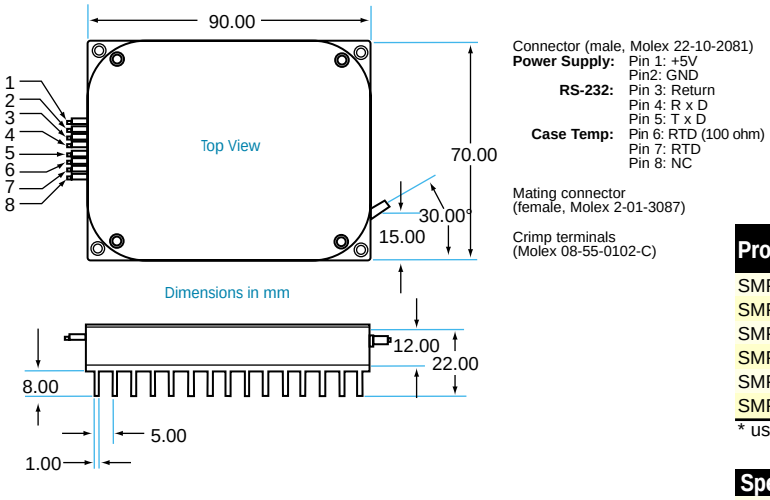
Other Wavelengths Available 1030 - 1060nm!

NP Photonics' ASE source is a high performance, high power, low cost and reliable incoherent light source for sensing and testing.

The ASE MMP-4010 is a low cost, ultra-compact ASE source. This Source produces a broadband output spectrum of amplified spontaneous emission (ASE) ranging from 1530nm to 1565nm. The Erbium Micro Fibre ASE (EMFASE) Module incorporates proprietary EMF (Erbium Micro Fibre) technology developed at NP Photonics. NP Photonics produces Telcordia compliant EMFASE modules built to perform under extreme operating conditions.



Dimensions - ASE MMP-4010



Connector (male, Molex 22-10-2081)
Power Supply: Pin 1: +5V
Pin2: GND
RS-232: Pin 3: Return
Pin 4: R x D
Pin 5: T x D
Case Temp: Pin 6: RTD (100 ohm)
Pin 7: RTD
Pin 8: NC

Mating connector
(female, Molex 2-01-3087)

Crimp terminals
(Molex 08-55-0102-C)

Product Code	Output Power (dBm)	Wavelength Range (nm)
MMP 4010-7	7	1530-1565
MMP-4010-10	10	1530-1565
MMP-4010-13	13	1530-1565

Specifications	MMP-4010	Note
Wavelength Range	1530 - 1565nm	C-Band
Total Output Power	10dBm	3 Versions (7, 10 and 13dm)
Power Consumption	<10W	
Package Dimension	45 x 70 x 12mm	Pre-qual samples 90 x 70 x 12mm
Fibre Pigtail	SMF-28, 1m long	Connectors Optional
	250 or 900µm Jacket Diameter	

Benchtop Erbium Micro Fibre Laser

SMPF-2030

- *Very narrow linewidth (long coherent length), <3 KHz*
- *Centre wavelength over C-band*
- *Up to 100 mW output power*
- *Single longitudinal mode*
- *Single polarisation operation*
- *High wavelength stability*
- *Microprocessor control*
- *Narrowly tunable*

NP Photonics' Benchtop Scorpion EMF Fibre Laser SMPF-2030 is a high power laser for sensing, LIDAR, test and measurement, and telecommunication applications. The Erbium Micro Fibre (EMF) laser Module incorporates proprietary EMF technology developed at NP Photonics.

This stand-alone system is turnkey operated and complies with CDRH requirements. Frequency and power can be controlled from the front panel or from a computer via RS-232. Windows™ compatible software is included with each system. Thermal frequency tuning can be accomplished via the front panel or via an RS-232 or coaxial port. Piezo frequency tuning is possible through the coaxial port.

The laser provides up to 100mW of output power over the telecommunications C-band (1530 - 1565nm). The Scorpion Benchtop facilitates the set up and control of the laser and is ideal for laboratory, university or R&D environments.

Product Code	Output Power (mW)	Wavelength Range (nm)	Tuning
SMPF2030-25-F	25	1530-1565*	Piezo
SMPF2030-50-F	50	1530-1565*	Piezo
SMPF2030-80-F	80	1530-1565*	Piezo
SMPF2030-25-T	25	1530-1565*	Thermal
SMPF2030-50-T	50	1530-1565*	Thermal
SMPF2030-80-T	80	1530-1565*	Thermal

* user specifies exact centre wavelength

Specifications	SMPF-2030	Note
Wavelength Range	1530 - 1565nm	
Output Power	25mW, 50mW, 80mW	100mW available
Longitudinal Mode	Single Frequency	
Wavelength Accuracy	7GHz	
Spectral Linewidth	<3kHz	
Coherence Length	>50km	
Relative Intensity Noise (RIN)	<-120 dB/Hz @ peak	<-140 dB/Hz @ other frequency
Side Mode Suppression Ratio (SMSR)	>50dB	
Polarisation Extinction Ratio (PER)	>40dB	
Tuning Range	Thermal 10 GHz	Piezo >100MHz
Fibre Pigtail	PM fibre, 1m long	Connectors optional
DC Voltage / Current Max.	+3V/4A	

C & L-Band ASE Light Sources

Applications

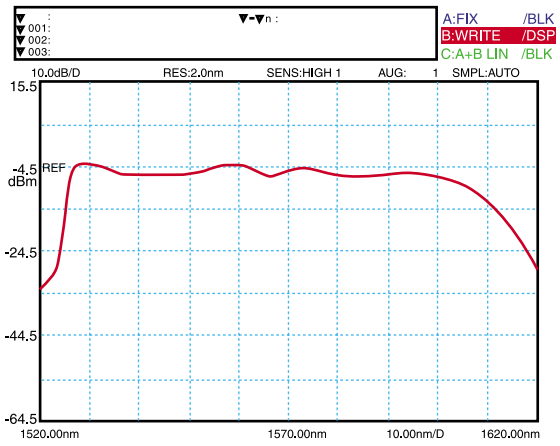
- *Spectral measurements of C- & L-Band DWDM passive components*
- *Raman amplifier gain and gain flatness test*
- *Noise simulation in DWDM systems*

Features

- *Large output power (+14 dBm typical)*
- *High spectral density (> -10 dBm/nm)*
- *Excellent output power stability (± 0.005dB)*
- *Competitively priced*

It is an ultra stable C&L-Band light source equipment designed for applications requiring high optical power over a wide wavelength range. It has useful applications for DWDM systems, sensor systems and components characterisation.

Single Optical Output Model



C & L-Band ASE Light Sources

Specifications		
Operating Wavelength	nm	1525 - 1610
Spectrum Density	dBm/nm	> -10 (1525nm to 1608nm)
Output Power	dBm	>+13 (+14 Typical)
Spectrum Flatness	dB	<3 (1528nm to 1600nm)
Power Stability	dB	±0.005 (5mins), ±0.02 (8hrs)
Output Connector		FC/PC, others on request
Dimensions	mm	(W x D x H); 257.5 x 324 x 103

C-Band ASE Light Sources

Types

- *with Gain Flattening Filter (GFF)*
- *without Gain Flattening Filter (GFF)*

Applications

- *Spectral measurements of C-Band DWDM passive components*
- *Noise simulation in DWDM systems*
- *Fibre optics sensors*
- *PMD measurement*

Features

- *Large output power (maximum 23 dB)*
- *Excellent output power stability (± 0.005 dB)*
- *Tunable output power*
- *Excellent spectrum flatness*

The OLS15C/OLS15CG is an ultra stable C-Band light source equipment designed for applications requiring high optical power over a wide wavelength range. It has useful applications for DWDM systems, sensor systems and components characterisation.

Benchtop ASE Sources

Product Code	Wavelength Range (nm)	Output Power (dBm)	Gain Flattened
OLS15C-B-10-FA	1525-1565nm	10	no GFF
OLS15C-B-13-FA	1525-1565nm	13	no GFF
OLS15C-B-15-FA	1525-1565nm	15	no GFF
OLS15C-B-17-FA	1525-1565nm	17	no GFF
OLS15C-B-20-FA	1525-1565nm	20	no GFF
OLS15C-B-23-FA	1525-1565nm	23	no GFF
OLS15CG-B-10-FA	1525-1565nm	10	GFF
OLS15CG-B-13-FA	1525-1565nm	13	GFF
OLS15CG-B-15-FA	1525-1565nm	15	GFF
OLS15CG-B-17-FA	1525-1565nm	17	GFF
OLS15CG-B-20-FA	1525-1565nm	20	GFF
OLS15EL-B-13-FA	1565-1610nm	13	no GFF

C-Band ASE Light Sources without GFF

Specifications		
Wavelength	nm	1525 - 1565
Spectrum Density	dBm/nm	>-4 (15dBm typical 1528nm to 1563nm)
Power Stability	dB	±0.005 (5mins), ±0.02 (8hrs)
Output Connector		FC/PC, others on request
Dimensions (W x D x H)	mm	Bench top: 257.5 x 324 x 103 Module: 150 x 125 x 24

C-Band ASE Light Sources with GFF

Specifications		
Wavelength	nm	1525 - 1565
Spectrum Flatness	dB	<1 at low output power (3 - 8dBm) <2 at high output power (<17dBm)
Power Stability	dB	±0.005 (5mins), ±0.02 (8hrs)
Output Connector		FC/PC, others on request
Dimensions (W x D x H)	mm	Bench Top: 257.5 x 324 x 103 Module: 150 x 125 x 24