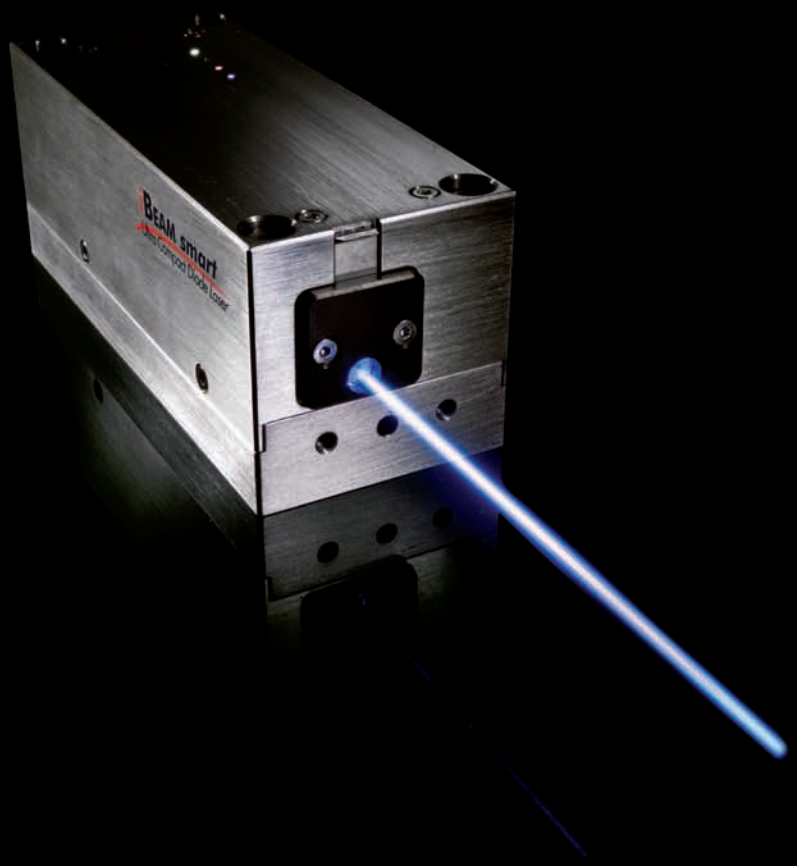
iBeam smart

Ultra-Compact Diode Laser



375 nm
395 nm
405 nm
420 nm
445 nm
473 nm
488 nm
515 nm
640 nm
660 nm
675 nm
685 nm
785 nm

Confocal Microscopy
Digital Photo Finishing
Disc Mastering
Flow Cytometry
Inspection
Metrology
Microlithography
Microplate Readout
Prepress, Computer-To-Plate
Retina Scanning

TOPTICA PHOTONICS
A Passion for Precision.

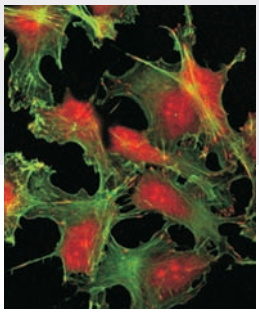
Key Features

Key features of iBeam smart

· Highest available power of single emitter, single-mode diode lasers
· Ultimate long-term power and beam pointing stability
· Diffraction limited, circular TEM_{00} beam
· Active thermal control of laser diode for best stability and reliability
· Small-size, all-in-one OEM package
· High performance, low noise laser diode driver incorporating µ-processor and RS 232 control
· Feedback-Induced Noise Eraser (FINE)
· Optional digital modulation with up to 250 MHz; simultaneous digital & analog modulation
· Optional fiber coupling with up to 90 % SM/PM fiber coupling efficiencies

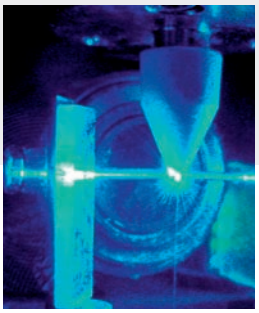
iBeam smart-S	Units	375-S	395-S	405-S	420-S	445-S	473-S	488-S	515-S	640-S	660-S	675-S	685-S	785-S
Wavelengths	nm	375	395	405	420	445	473	488	515	640	660	675	685	785
Wavelength range	nm	± 3	± 3	± 4	± 5	± 5	± 3	+ 1/- 5	± 5	+ 5/- 3	± 3	± 5	± 5	± 5
Output power	mW	18	120	120	120	50	20	100	50	150	130	25	50	125

Applications



Confocal Microscopy

2D, 3D, 4D imaging of biological cells and tissues.

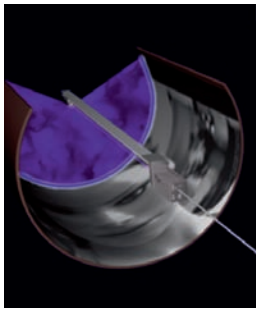


Flow Cytometry / HTS / HCS

Identification and separation of cells via laser fluorescence and scattering.

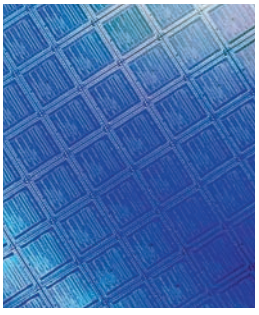
Disc Mastering

Exposure of CD, DVD or BD/HD glass masters.



Reprographics/ CtP Printing

Exposure of silver halides or photopolymers.



Microlithography

Direct exposure of photoresist in lithography masks.

Metrology

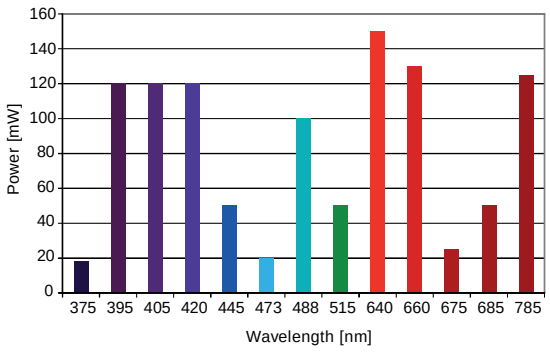
Optical thin film analysis by polarization and angle selective Fresnel reflections.

Specifications

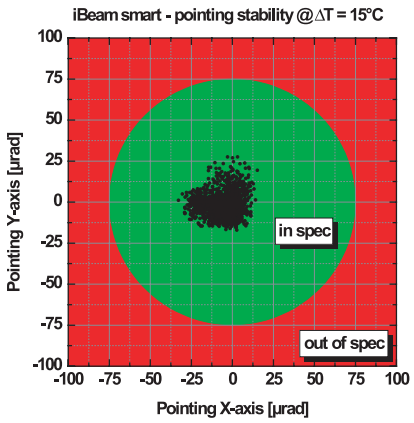
iBeam smart-S	Units	375-S	395-S	405-S	420-S	445-S	473-S	488-S	515-S	640-S	660-S	675-S	685-S	785-S
Optical specifications														
Wavelengths*	nm	375	395	405	420	445	473	488	515	640	660	675	685	785
Wavelength range	nm	± 3	± 3	± 4	± 5	± 5	± 3	+ 1/- 5	± 5	+ 5/- 3	± 3	± 5	± 5	± 5
Output power	mW	18	120	120	120	50	20	100	50	150	130	25	50	125
Fiber coupled output power (guaranteed)	mW	12	70	70	70	35	14	60	30	100	90	16	30	90
Power stability (drift over 48 h @ room temperature ± 5°C)	%	< 0.5												
RMS noise (10 Hz –10 MHz)	%	< 0.2												
Beam diameter (typ. @ $1/e^2$)	mm	1.3	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.1	1.3	1.2	1.2	1.3
Beam shape (far field)		Circular												
Ellipticity	%	< 10												
Divergence (typ.)	mrad	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.7	< 0.7	< 0.7	< 1	< 1	< 1	< 1	< 1
M^2		< 1.2												
Pointing stability	µrad/K	< 5												
Static alignment** (x–y/angular)		± 0.2 mm, ± 0.5 mrad												
Polarization ratio (typ.)		> 100:1												
Polarization orientation		Linear, Vertical ± 3°												
Electronic specifications														
Digital modulation (option)														
Supported digital signal levels		TTL												
Max. digital modulation frequency	MHz	250												
Rise/Fall time (10% – 90%)	ns	< 1.5												
Digital modulation extinction ratio		> 1000:1												
Analog modulation														
Max. analog modulation frequency	MHz	1												
Analog modulation extinction ratio		10^6												
Electronic shutter														
Rise/Fall time	µs	40/10												
Extinction ratio		∞ (complete off)												
General and environmental specifications														
Qualified		CE												
CDRH qualification		Class IIIb												
ESD protection		Level 4												
Digital communication interface		RS 232, ≤ 115.200 baud												
DC input requirements		12 V DC, 2A												
Power consumption	W	< 18 (typ. < 6)												
Max. heat dissipation (baseplate @ 50°C)	W	< 12												
Warm-up time	min	< 5												
Operating temperature range	°C	15 .. 40												
Storage temperature range	°C	- 10 .. 60												
Operating relative humidity (non-condensing)	%	< 90												
Dimensions (L x W x H)	mm^3	100 x 40 x 40												
Weight	g	< 250												

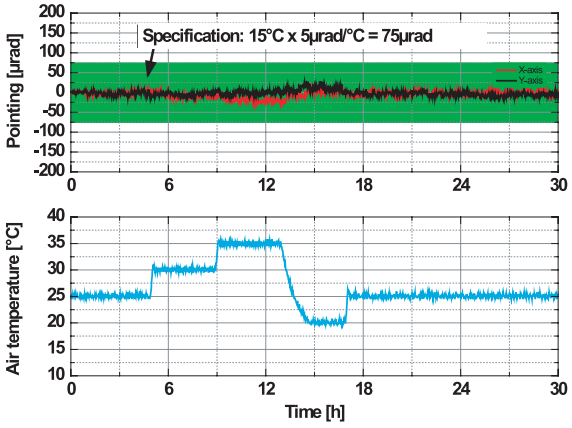
*Other wavelengths on request. **Static alignment tolerances are relative to reference holes in baseplate

Smart Engineering — Pure Performance

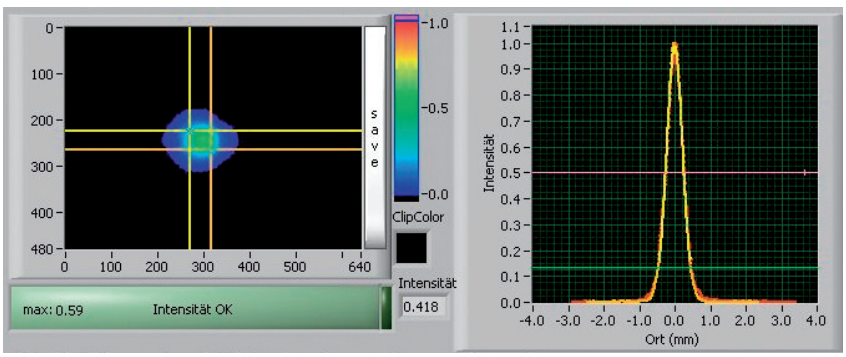


iBeam smart standard wavelengths with highest optical power





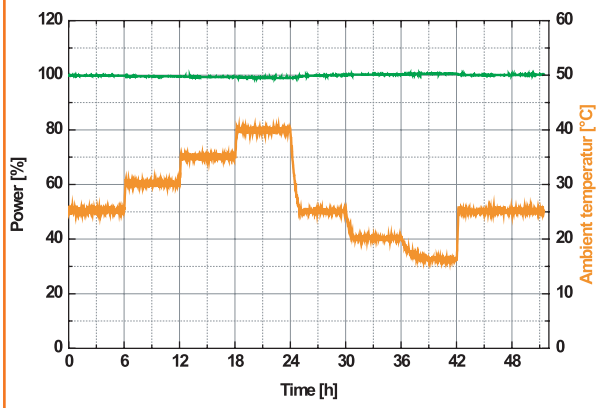
Ultimate beam pointing stability – beam stays far within specification and returns to starting point.



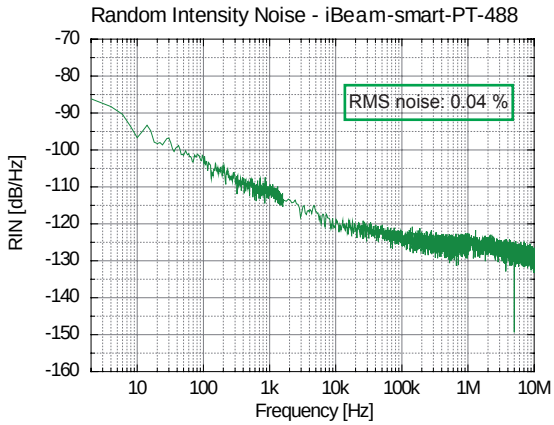
Excellent beam quality — diffraction limited circular TEM_{00} beam

iBeam smart CLUP — Optional clean-up filter for selected wavelengths

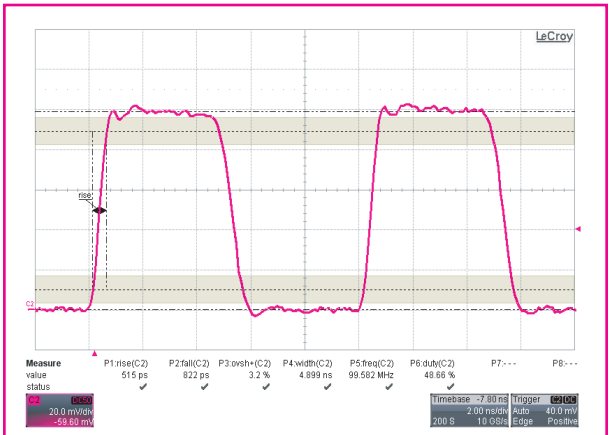
Smart Engineering — Pure Performance



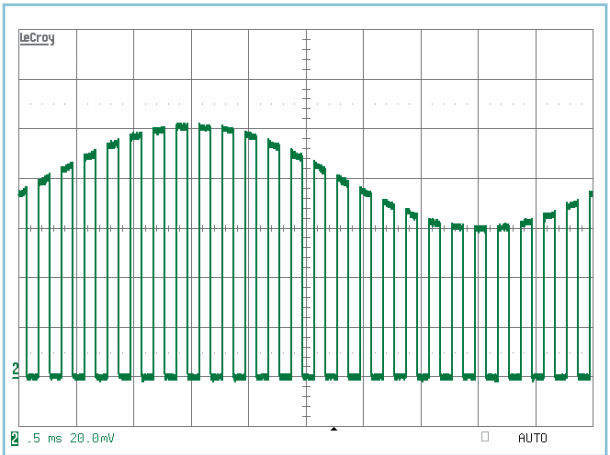
Best power stability (< 0.5 % over 48 h) even under changing ambient temperature



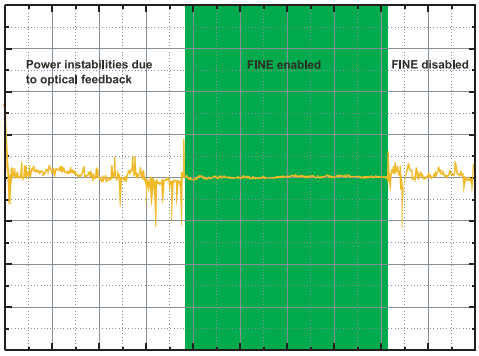
Lowest noise at any frequency — RMS noise < 0.2 %



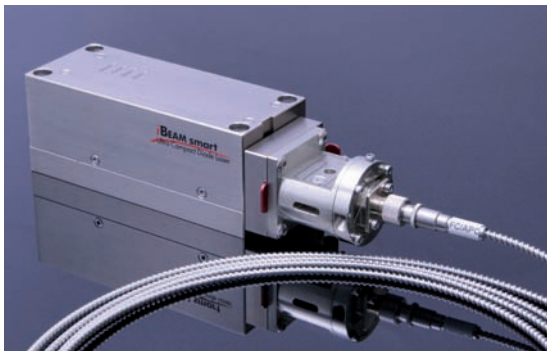
Fastest pulses with iBeam smart pulse option



Combined analog and digital modulation

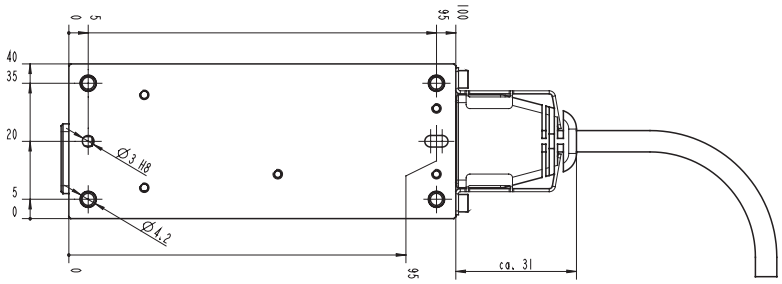


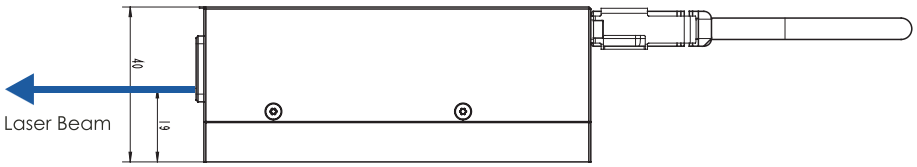
FINE — eliminating noise caused by optical feedback.

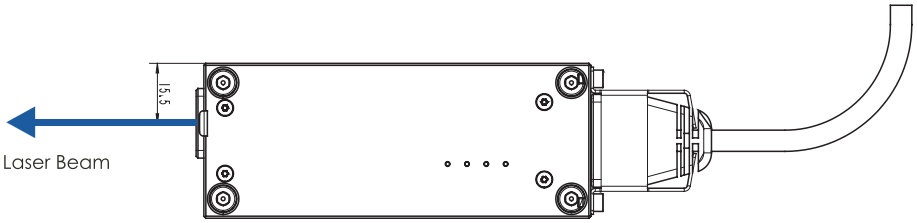


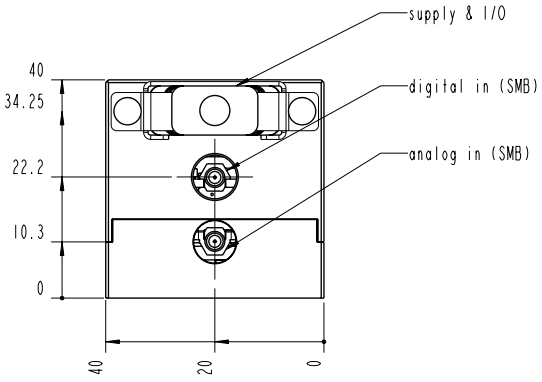
SmartDock — Highly efficient and ultra stable fiber coupler for iBeam smart

Mechanical Drawings

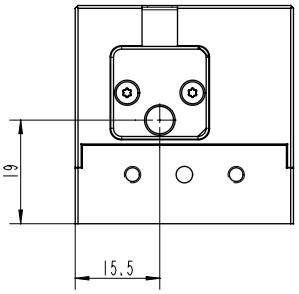








- BACK -



- FRONT -

All dimensions given in mm

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