

*Flexible configuration- up to 8 lines  
Unrivalled spectral range,  
efficiency & stability*

Enhanced Laser Illumination

## Features and Benefits

- **Multi-line laser source**  
Up to 4 lines in the ILE-400 and up to 8 lines in the ILE-800
- **Direct modulation Lasers**  
Exceptional spectral range, stability and efficiency
- **Wide VIS-NIR spectral range**  
405-785 nm, 50-200 mW per line
- **Three-port switch: multi-function flexibility**  
Millisecond switching between Confocal, TIRF and FRAP
- **Field upgradeable\***  
Protect your investment and expand capabilities as required
- **Thermally managed**  
Long term, ultra-stable power delivery
- **Borealis-compatible**  
Enhanced throughput, stability and uniformity for widefield and spinning disk confocal imaging

## High efficiency, multi-line laser source

The Andor Integrated Laser Engine (ILE) is a third generation multi-line laser source delivering between two and eight laser lines via one, two or three optical fibre outputs. The ILE benefits from more than 10 years global field experience in the design and manufacture of laser engines, an installed base approaching a thousand users and exploits the best technologies from Andor and Spectral Applied Research.

Key features of the ultra-stable platform include active thermal control, vibration isolation and optimal laser beam management to deliver robust long-lived performance. Utilizing primarily direct modulation (DM) lasers, the ILE achieves unrivalled spectral range, efficiency and stability. Fifty to more than one hundred milliwatts is available on most DM laser lines, providing plenty of power for your bio-imaging and spectroscopy needs. ILE is available in Class 3B and Class 4 models.

Control of the unit is via either RS-232, USB2 or direct analog/TTL control of individual lasers via rear panel connections. The unit provides fast laser blanking via 4 inputs to allow multi-camera, FRAP and user-specified control for flexibility.

## Key Specifications

Model	ILE-400	ILE-700	ILE-800
Max number of lasers	4	7	8
Output Mode	Single and/or multi		Minimum 1 port multi (8 lines)
Wavelength range (nm)	405-785		
Multiport switch outputs	2, 3		+1 or +2
Multiport switch time (ms)	3		
Blank/TTL Modulation (diode) MHz	4		
Blank/TTL Modulation (OPSL) MHz	0.05		
Computer control interface	RS-232, USB2		
TTL/Analog control interface	HD15 D-sub	HD15 D-sub x2	

# 1 Applications & Key Features of the ILE



## For the ultimate in Stability and Efficiency

The ultra-stable design makes the ILE a perfect companion for a host of bio-imaging, photo-stimulation, spectroscopy and related scientific applications, where stability and efficiency contribute to precise, high SNR measurements.

- ✓ **Bio-imaging**
- ✓ **Photo-stimulation**
- ✓ **Spectroscopy**
- ✓ **TIRF**

## Broad Wavelength Range

The broad wavelength range enables bio-imaging into the NIR where auto-fluorescence can be avoided, adding channels to multiplexed experiments or improving penetration into thick specimens (see figure right).

## Fast Switching Multi-port Options

Fast switching (3 ms) multi-port options allow the ILE to be used with multiple application modes using any combination of two or three single or multi-mode optical fibres.

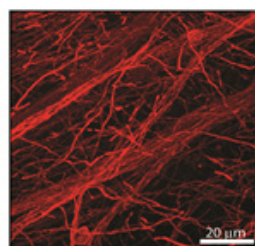
### Single Mode

- TIRF and photo-bleaching/activation illumination requires a single mode fibre.
- Single molecule applications benefit from Borealis uniformity along with Andor's unrivalled EMCCD and scientific CMOS detectors.

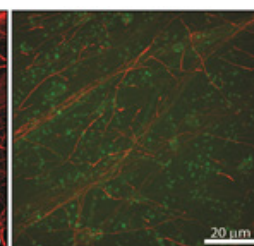
### Multi-Mode

- Laser epi- or single molecule imaging, benefits from multi-mode coupling with homogenization, as exemplified with our patented Borealis illumination solution.
- Multi-mode fibres have larger diameter cores than single mode, enabling very high and stable coupling efficiencies, but their output must be homogenized to deliver usable illumination free of mode interference patterns.

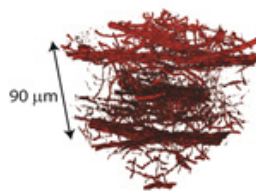
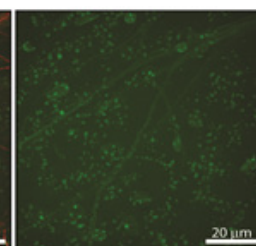
Rat brain oligodendrocytes labelled with LI-CorIR®Dye 800CW NHS Ester



Volume projection with native rat brain tissue autofluorescence

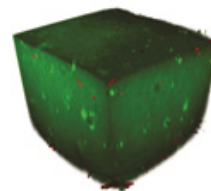


Volume projection of only rat brain tissue autofluorescence



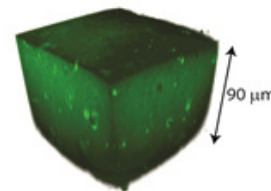
**730 nm**  
Excitation

**770-800 nm**  
Emission



**488 & 730 nm**  
Excitation

**510-540 & 770-800 nm**  
Emission



**488 nm**  
Excitation

**510-540 nm**  
Emission

## Combine ILE with Borealis for Superb Uniform Illumination



BCU - Beam conditioning Unit.



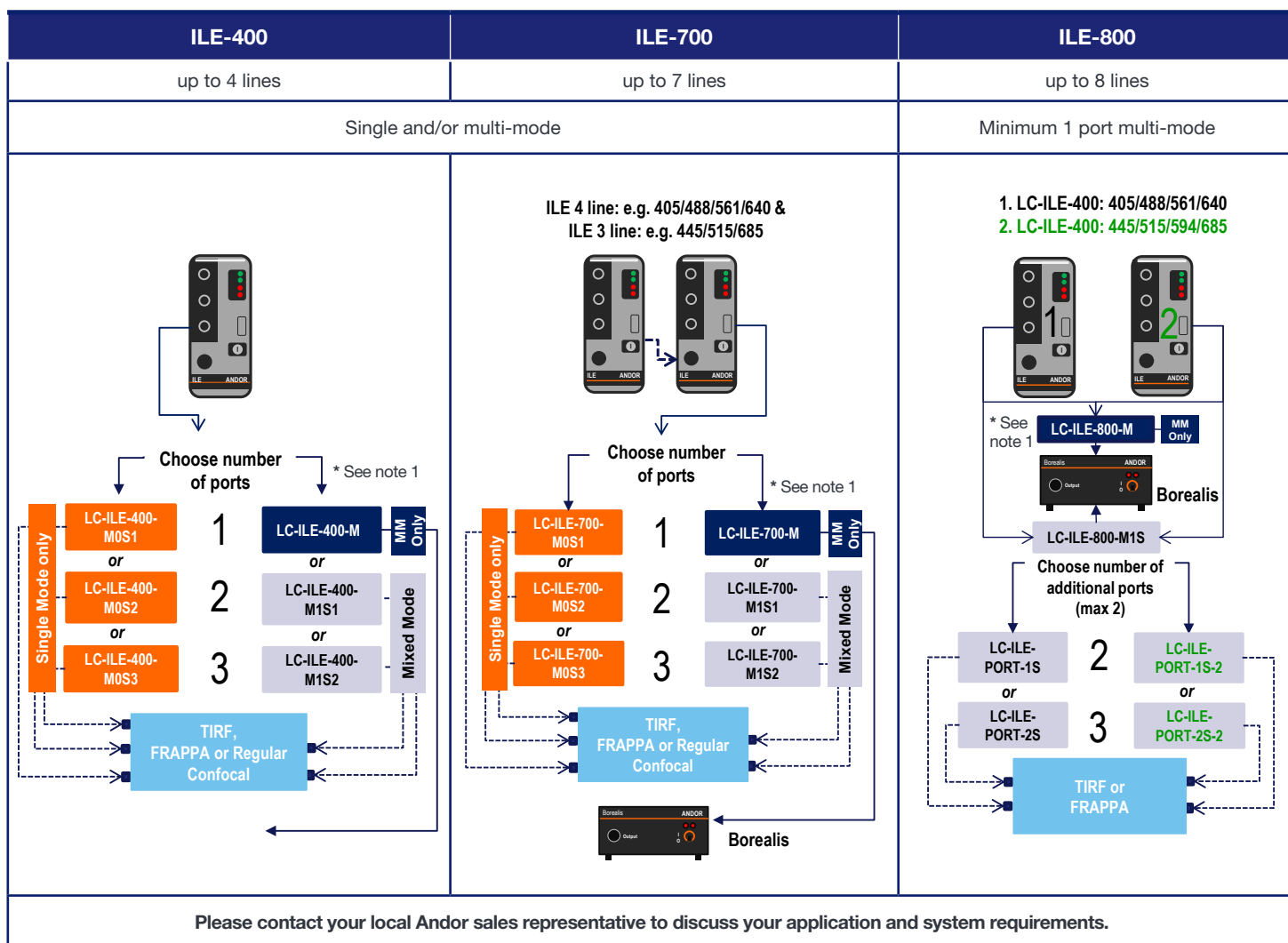
Dragonfly confocal system

- The ILE is optimized for Borealis illumination, with a multi-mode fibre output for direct coupling to the Beam conditioning unit (BCU).
- Homogenization of the multi-mode output of the BCU allows for superbly uniform illumination with our Dragonfly confocal system, with throughput of around three times that of conventional single mode fibres.
- Find out more about Dragonfly and Borealis at:

<https://andor.oxinst.com/products/dragonfly>

## 2 Flexible System Configurations

The ILE offers exceptional flexibility in system configuration so you can tailor the ILE to the exact requirements of your application. The ILE is available in base configurations offering up to 4 (ILE-400), 7 (ILE-700) or 8 (ILE-800) laser lines, as well as both single mode and multi-mode port options. In addition the ILE has been designed to enable in-field upgrades so that your system may evolve to meet your future research needs. In-field upgrades only applicable to adding lasers and a second ILE unit (e.g. ILE-400 to ILE-700, or ILE-400-M to ILE-800-M).



## Andor's EMCCD and Scientific CMOS Detection Solutions

- For when every photon counts, Andor's range of high resolution and high sensitivity EMCCD and scientific CMOS detectors are available.
- To find out more, please see:

<https://andor.oxinst.com/cameras-for-microscopy>



Andor iXon Life EMCCD

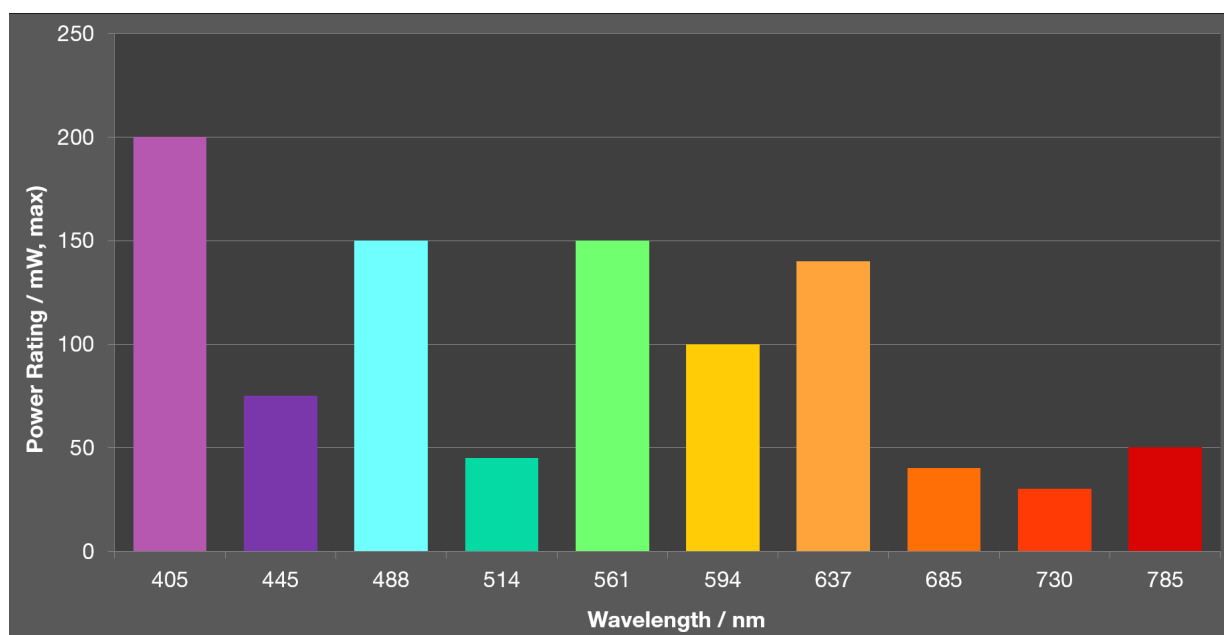


Andor Sona sCMOS

### 3 Laser Options available for the ILE

The laser wavelengths and (max) powers supported in the ILE laser engines are outlined in the figure below.

Note: Supported lasers and laser power levels change with some frequency, so please contact your sales channel to request the latest information if the list does not meet your needs. Other laser options may be available by customer request: again, please contact your sales channel for more information.



The following table lists the power rating options available for the laser wavelengths currently supported by the ILE laser combiners.

Wavelength (nm)	Power Rating (mW)
405 ***	100, 200
445 ***	75
488 **	50, 150
514 **	45
561 **	50, 100, 150
594 **	60, 100
637 ***	140
685 ***	40
730 ***	30
785 ***	100

Wavelength variation (nm) depends on laser type: \*\*  $\pm 2$ , \*\*\*  $\pm 5$

Note: The ILE features pulse width modulation (PWM) power control for direct modulation lasers. The PWM can be selectively enabled to support lower power levels and finer control than is possible by direct modulation alone. When active, PWM typically delivers power settings from 5% down to 0.01% in 0.01% increments and provides significant benefit to TIRF and localization microscopy using photo-activation. Spinning disk microscopy will operate at higher power levels (typically  $\geq 10\%$ ) and does not benefit from PWM. It is recommended to deactivate the PWM feature for spinning disk microscopy.



## 4 Choosing your ILE System

Prior to commencing the order process please advise your customer representative of your application requirements.

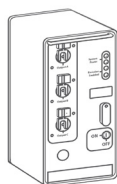
### Step 1. Choose the number of laser lines you would like in your ILE

#### Up to 4 lines (ILE-400)

Description	Mode	Part No.
4 line ILE single-mode only single port	Single Mode only	LC-ILE-400-M0S1
4 line ILE single-mode only dual port	Single Mode only	LC-ILE-400-M0S2
4 line ILE single-mode only triple port	Single Mode only	LC-ILE-400-M0S3
4 line ILE single port multi-mode only	Multi-mode only	LC-ILE-400-M
4 line ILE multimode with 1x SM port	Mixed Mode	LC-ILE-400-M1S1
4 line ILE multimode with 2x SM port	Mixed Mode only	LC-ILE-400-M1S2

#### Up to 7 lines (ILE-700)

Description	Mode	Part No.
7 line ILE single-mode only single port	Single Mode only	LC-ILE-700-M0S1
7 line ILE single-mode only dual port	Single Mode only	LC-ILE-700-M0S2
7 line ILE single-mode only triple port	Single Mode only	LC-ILE-700-M0S3
7 line ILE single port multi-mode only	Multi-mode only	LC-ILE-700-M
7 line ILE multi-mode with 1x SM port	Mixed Mode	LC-ILE-700-M1S1
7 line ILE multi-mode with 2x SM port	Mixed Mode	LC-ILE-700-M1S2



No of Laser  
Lines

#### Up to 8 lines (ILE-800)

Description	Mode	Part No.
8 line ILE single port multi-mode only	Multi-mode only	LC-ILE-800-M

#### 8 Lines Mixed Mode (by CSR only)

Description	Mode	Part No.
8 line ILE single port multi-mode only	Multi-mode only	LC-ILE-800-M1S

#### Select Ports- Up to maximum of 2 single ports

First SM port on primary ILE-800 unit	LC-ILE-PORT-1S
First SM port on secondary ILE-800 unit	LC-ILE-PORT-1S-2
Second SM port on primary ILE-800 unit	LC-ILE-PORT-2S
Second SM port on secondary ILE-800 unit	LC-ILE-PORT-2S-2

Continue to Step 2 overleaf...

Continued from Step 3 on the previous page.

## Step 2. Select Additional fibres



### Additional Fibre Selection

**Note:** Fibre selection is typically only required for 3rd party products

Single mode, polarization maintaining (PM) fiber for applications that require angled fibre input. Typical applications are standard CSU heads with angled input and TIRF systems with angled input.

**LD-FIBR-PMTA**

## Step 3. Select the laser powers and wavelengths you require

**Note 1:** Some laser combinations may not be supported if the wavelengths are too close.

**Note 2:** New laser lines and powers change frequently and this list may not stay up-to-date with these changes. Please contact your Andor representative for current options.

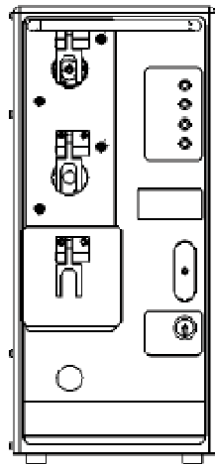


### Laser Power & Wavelength

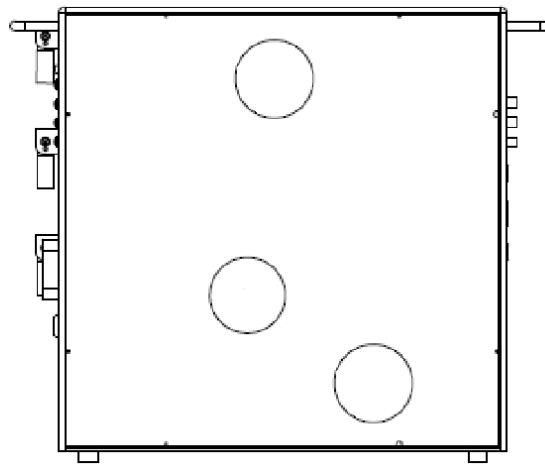
Description	Compatibility considerations	Part No.
Solid state 405 nm smart laser where XXX is 100 or 200 mW	> 4 lines place in primary ILE unit	<b>LM-405-XXX</b>
Solid state 445 nm smart laser at 75 mW	> 4 lines place in secondary ILE unit	<b>LM-445-075</b>
Solid state 488 nm smart laser at xxx mW where XXX is 050 or 150 mW	> 4 lines place in primary ILE unit	<b>LM-488-XXX</b>
Solid state 514 nm smart laser at 45 mW	> 4 lines place in secondary ILE unit	<b>LM-514-45</b>
Solid state 561 nm smart laser at xxx mW where XXX is 050, 100 or 150 mW	> 4 lines place in primary ILE unit	<b>LM-561-XXX</b>
Solid state 594 nm smart laser at xxx mW where XXX is 060 or 100 mW	> 4 lines place in secondary ILE unit	<b>LM-594-XXXSL</b>
Solid state 637 nm smart laser at 140 mW	> 4 lines place in primary ILE unit	<b>LM-637-140</b>
Solid state 685 nm smart laser at 40 mW	> 4 lines place in secondary ILE unit	<b>LM-685-40</b>
Solid state 730 nm smart laser at 30 mW	> 4 lines place in secondary ILE unit	<b>LM-730-30</b>
Solid state 785 nm smart laser at 100 mW	> 4 lines requires CSR (BCU-200 dichroic)	<b>LM-785-100</b>

## Product Drawings

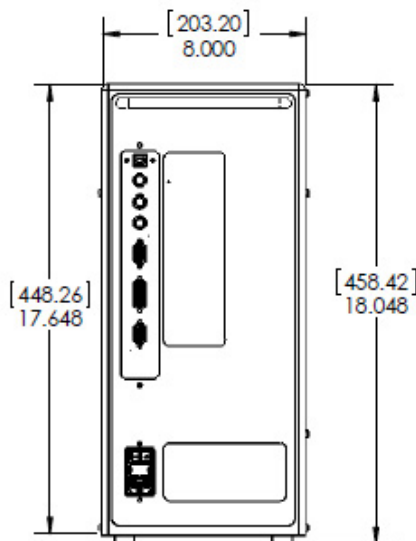
Dimensions in inches [mm]



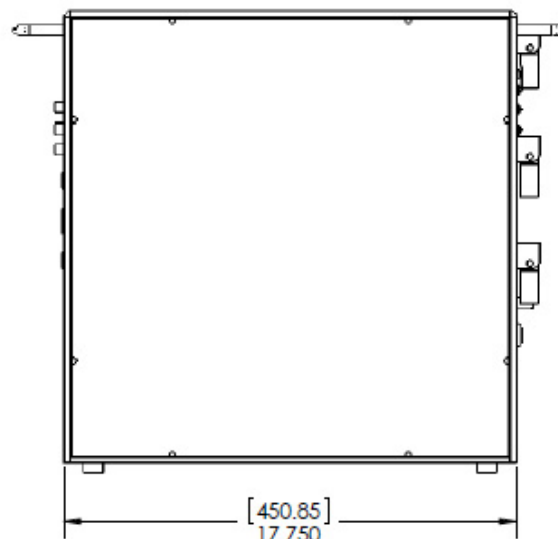
Front Panel



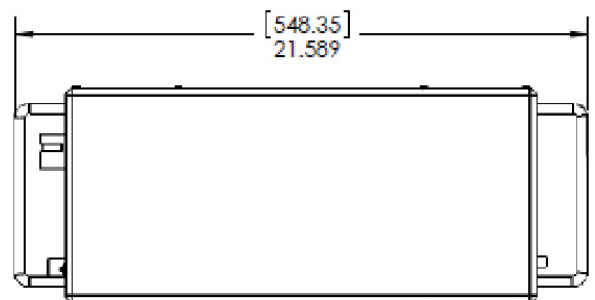
Right Side Panel



Rear Panel



Left Side Panel



Top Panel

Model	ILE-400	ILE-700/800
Dimensions inches (cm)	18x18x8 (46x46x20)	18x18x16 (46x46x41)
Weight, fully loaded, lbs (kg)*	44 (20)	(88) 40

Notes:

Allow 3.9 inches [100 mm] space around the ILE for ventilation

\*Weight will vary with system configuration



# Order Today

Need more information? At Andor we are committed to finding the correct solution for you. With a dedicated team of technical advisors, we are able to offer you one-to-one guidance and technical support on all Andor products. For a full listing of our regional sales offices, please see: [andor.com/contact](http://andor.com/contact)

Our regional headquarters are:

## Europe

Belfast, Northern Ireland  
Phone +44 (28) 9023 7126  
Fax +44 (28) 9031 0792

## Japan

Tokyo  
Phone +81 (3) 6732 8968  
Fax +81 (3) 6732 8939

## North America

Concord, MA, USA  
Phone +1 (860) 290 9211  
Fax +1 (860) 290 9566

## China

Beijing  
Phone +86 (10) 8271 9066  
Fax +86 (10) 8271 9055

### Items shipped with your system:

Fully configured ILE Platform (ILE-400, or ILE-400 and ILE-300 for ILE-700, ILE 400 x2 for 800 system)  
Single or Multi-mode fibres as ordered  
System Performance Sheet  
User Manual in electronic format  
USB2 Cable  
Communication Cable (RS-232)  
Triggering and interlock cables (BNC)  
Blanking cable: HD 15D-sub to 3x BNC male  
Country specific power cable

### Footnotes: Specifications are subject to change without notice

1. For mixed mode systems, the multi-mode port is always the last port. i.e. port 2 of a 2 port, or port 3 of a 3 port ILE configuration.
2. ILE models registered CDRH and IEC Class 3B or Class 4 according to laser selections.
3. Standard warranty - 12 months parts and labour.
4. Extended warranty- up to 5 years, is available on request.
5. Installation, service and upgrade should be performed by qualified personnel.
6. All local safety standards should be followed by users.
7. If your specific requirements are not covered in this document, please contact your sales channel. We will certainly consider special requests.



ILE Class 3B/4 laser safety classification labels

### Minimum Computer Requirements:

- Compatible with Andor Fusion, iQ, Micro-Manager, MetaMorph and supported in Andor ALC SDK

### Laser Safety Requirements

- Dependent on system configuration- contact your representative for further information.

### Regulatory Compliance

- EU EMC/ LV/ Machinery/ RoHS Directives
- Laser safety compliant for IEC 60825-1 and CDRH 21 CFR 1040.10

### Operating & Storage Conditions

- Operating Temperature: 18°C to 28°C ambient
- Operating Relative Humidity: < 70% (non-condensing)
- Storage Temperature: -20°C to 50°C ambient

### Power Requirements

- Mains Power supply: 100-240 VAC, 50/60 Hz
- Power consumption: ILE-400: 60 W typical (300W max), ILE-700/800: 120 W typical (600W max).

