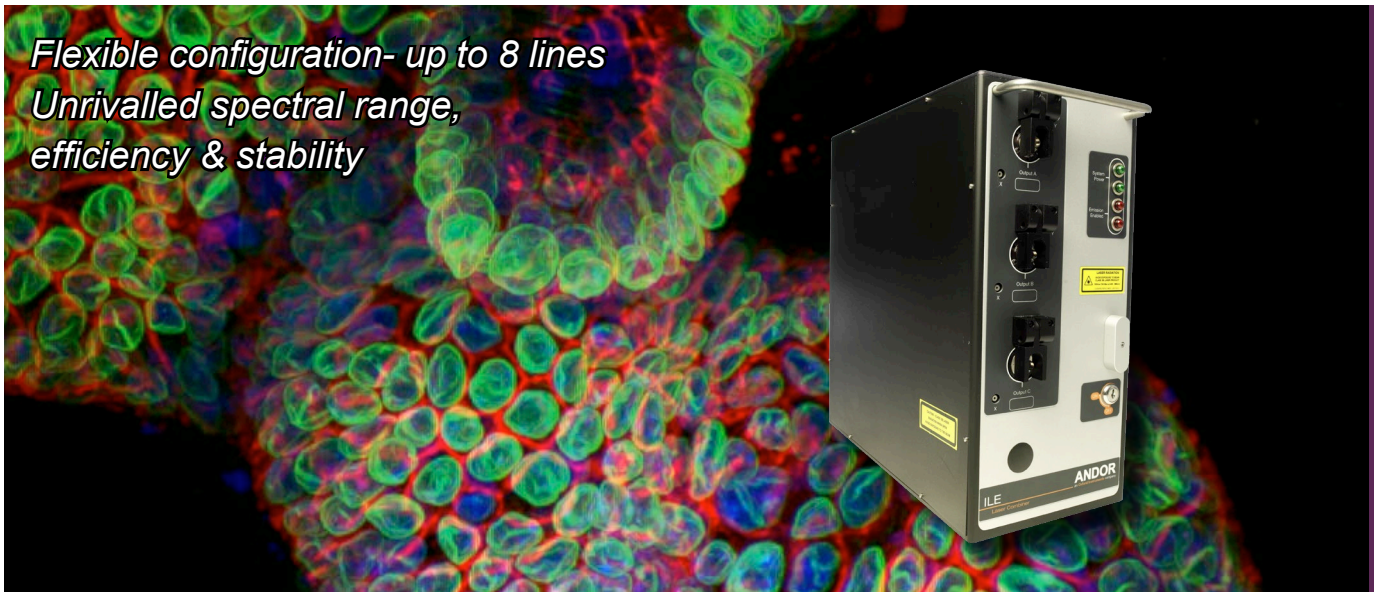


Enhanced Laser Illumination

Features and Benefits

- **Multi-line laser source**
  Flexible configuration allows up to 4 lines in the ILE-400 and up to 8 lines in the ILE-800
- **Direct modulation Lasers**
  Obtain exceptional spectral range, high efficiency and stability
- **Wide VIS-NIR spectral range**
  The ILE is compatible with a wide range of laser sources and wavelengths, the current selection covers from 405 up to 785 nm
- **Three-port switch: multi-function flexibility**
  Switch effortlessly between Confocal, TIRF, widefield and/or FRAP modes
- **Field upgradeable**[4]
  Enables you to protect your investment and expand the capabilities of your system in the future
- **Thermally managed**
  Effective thermal regulation helps to provide long-term, ultra-stable performance
- **Borealis-compatible**
  Benefit from enhanced throughput and uniformity in widefield and spinning disk confocal systems.

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 six hundred 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

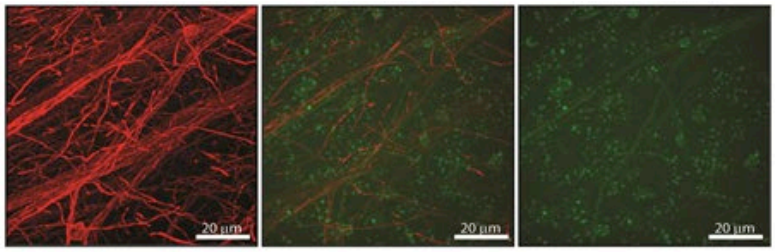
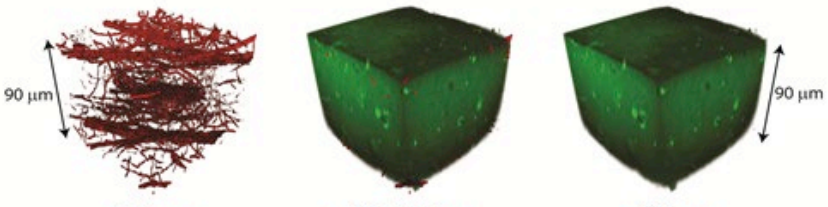
Fast switching (3 ms) multi-port options allow the ILE to be used with multiple application modes using any combination of two or three single or multi-mode optical fibres.

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 oligodendendrocytes 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

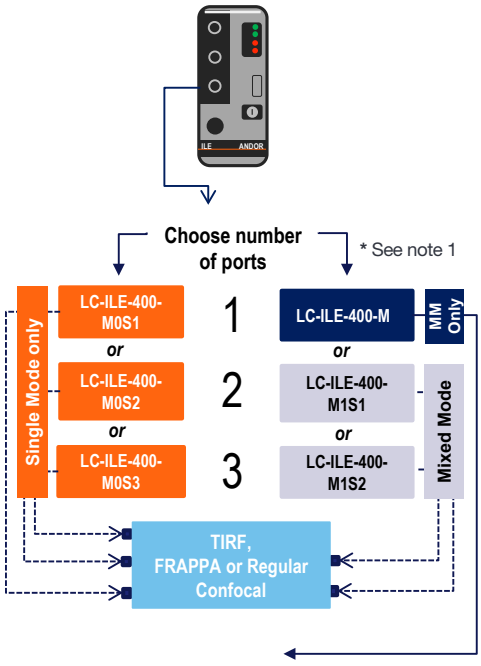
- The ILE is optimized for Borealis illumination, with a multi-mode fibre output for direct coupling to the Beam conditioning unit (BCU).
- Homogenization of the multi-mode output of the BCU allows for superbly uniform illumination with our Dragonfly confocal system, with throughput of around three times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

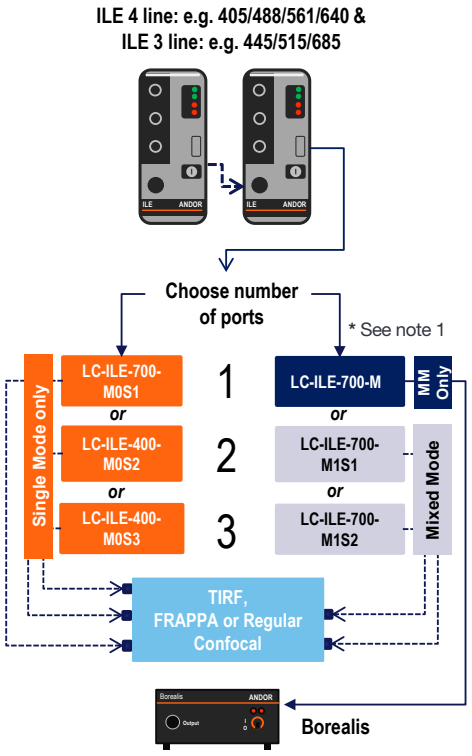
www.andor.com/microscopy-systems/revolution/dragonfly

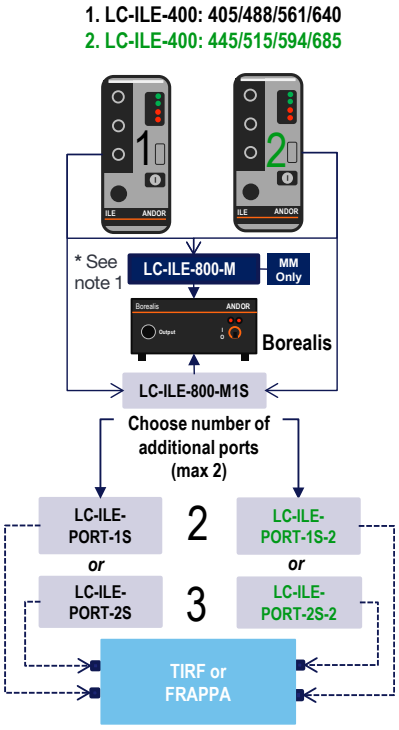
2 Flexible System Configurations

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).

ILE-400	ILE-700	ILE-800
up to 4 lines	up to 7 lines	up to 8 lines
Single and/or multi-mode		Minimum 1 port multi-mode







Please contact your local Andor sales representative to discuss your application and system requirements.

Andor's EMCCD and Scientific CMOS Detection Solutions

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

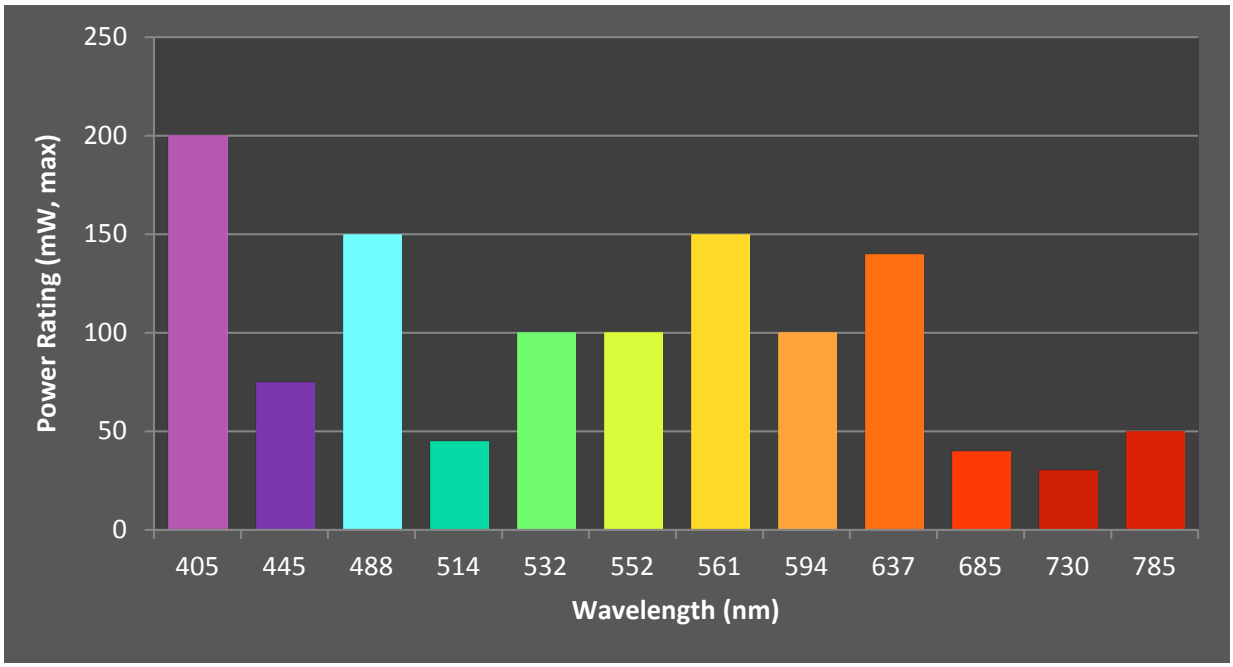
www.andor.com/scientific-cameras

Andor iXon EMCCD

Andor 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
532 **	100
552 **	100
561 **	50, 100, 150
594 **	60, 100
637 ***	140
660 ***	100
685 ***	40
730 ***	30
785 ***	50

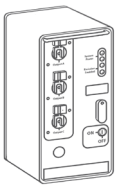
Wavelength variation (nm) depends on laser type: ** ±2, *** ±5

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 ≥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



No of Laser Lines

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**

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

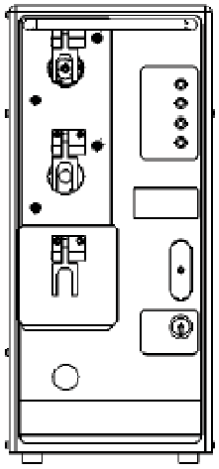
Laser Power & Wavelength

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.

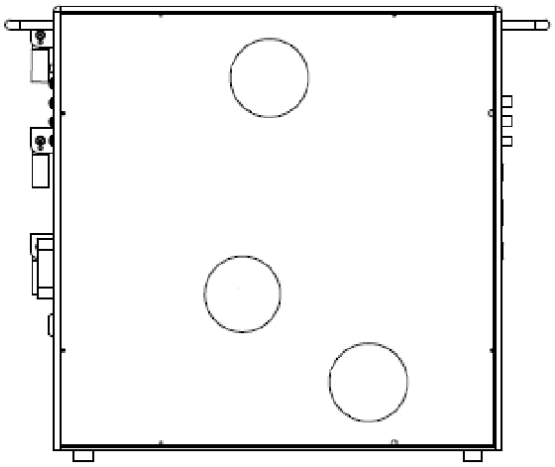
Description	Compatibility considerations	Part No.
Solid state 405 nm smart laser where XXX is 100 or 200 mW	> 4 lines place in primary ILE unit	**LM-405-XXX**
Solid state 445 nm smart laser at 75 mW	> 4 lines place in secondary ILE unit	**LM-445-075**
Solid state 488 nm smart laser at xxx mW where XXX is 050 or 150 mW	> 4 lines place in primary ILE unit	**LM-488-XXX**
Solid state 514 nm smart laser at 45 mW	> 4 lines place in secondary ILE unit	**LM-514-45**
Solid state 532 nm smart laser at 100 mW	> 4 lines place in secondary ILE unit	**LM-532-100**
Solid state 532 nm smart laser at 100 mW	Single mode or ILE-400 only. CSR for others	**LM-552-100**
Solid state 561 nm smart laser at xxx mW where XXX is 050, 100 or 150 mW	> 4 lines place in primary ILE unit	**LM-561-XXX**
Solid state 594 nm smart laser at xxx mW where XXX is 060 or 100 mW	> 4 lines place in secondary ILE unit	**LM-594-XXXSL**
Solid state 637 nm smart laser at 140 mW	> 4 lines place in primary ILE unit	**LM-637-140**
Solid state 660 nm smart laser at 100 mW	> 4 lines place in secondary ILE unit	**LM-660-100**
Solid state 685 nm smart laser at 40 mW	> 4 lines place in secondary ILE unit	**LM-685-40**
Solid state 730 nm smart laser at 30 mW	> 4 lines place in secondary ILE unit	**LM-730-30**
Solid state 785 nm smart laser at 50 mW	> 4 lines requires CSR (BCU-200 dichroic)	**LM-785-50**

Product Drawings

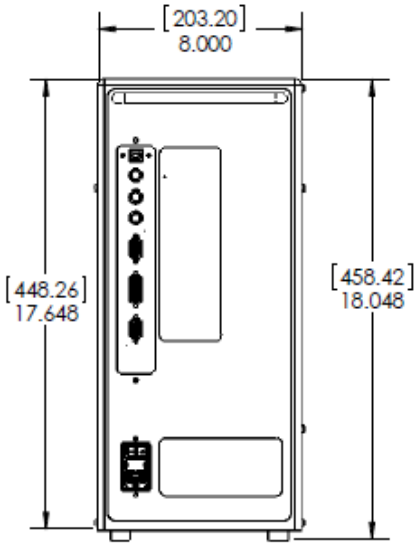
Dimensions in inches [mm]



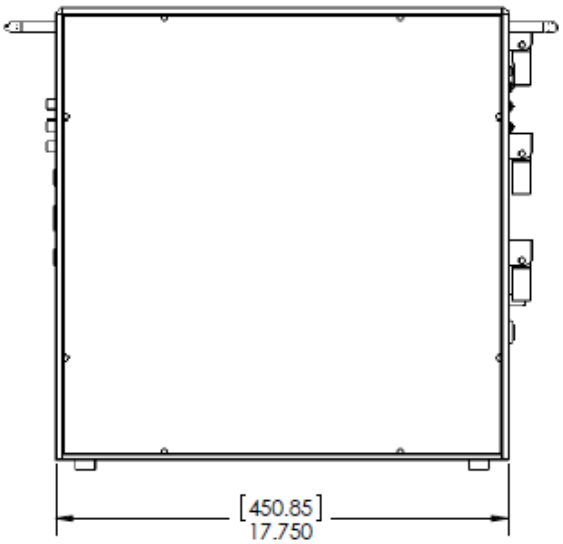
Front Panel



Right Side Panel



Rear Panel



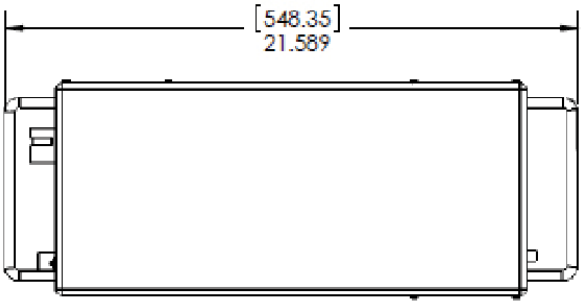
Left Side Panel

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



Top Panel

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

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

OXFORD INSTRUMENTS
The Business of Science®

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).

bsi. ISO 9001 Quality Management FM40523
bsi. ISO 14001 Environmental Management EMS91062
bsi. OHSAS 18001 Occupational Health and Safety Management OHS02497

CE