IsoPlane® 81

Aberration-Free Spectrograph
& Accessories

The Best Imaging Spectrograph on the Market

Years of Research Satisfaction

When the first aberration-free IsoPlane 320 was introduced in 2013, it immediately became the **gold standard** for imaging spectrographs. Today, IsoPlane instruments remain the only aberration-free spectrographs on the market.

2013

2020
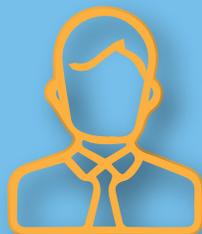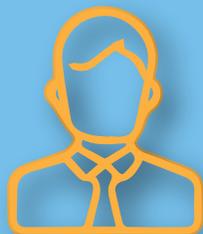
"One of the ways we use IsoPlane 81 is together with a custom-made confocal microscope to collect single-particle fluorescence and scattering data that is then correlated with electron microscopy data."

—Dr. Denis Boudreau Université Laval

"I can honestly say IsoPlane 81 is changing the way we do spectroscopy in our lab."

— Mark Waterland Associate Professor Massey University

"IsoPlane 81 offers a lot of convenience, all in one system"

—Dr. Nilam C. Shah Lake Forest College

"The IsoPlane 81 system's small footprint and easy integration make it a perfect fit for our lab."

— Rajesh N. Davé, Distinguished Professor New Jersey Institute of Technology

Key Markets & Applications

Markets

Pharmaceutical

Drug discovery; PAT; QC; Anti-counterfeit

Bio & Life Science

Cancer diagnostics; Surgery guidance; Flow cytometry
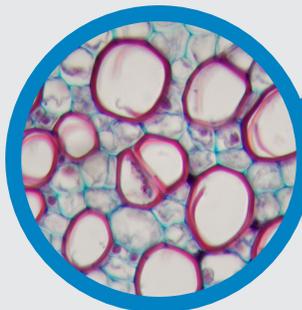
Materials Science

2D; Nano; LED; Solar

Environmental Science

Droplet and aerosol; Pollutants; Microplastics

Art & Archeology

Pigments; Conservation; Authenticity

Primary Applications

Raman Spectroscopy and Imaging

Fluorescence, Emission, Absorption

Hyperspectral imaging

Microspectroscopy

#1 in Innovation for Highest SNR
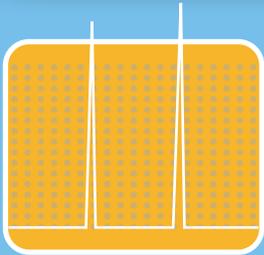
ABERRATION-FREE SPECTROGRAPH
- No coma and astigmatism at all wavelength
- Diffraction-limited spectral resolution

DEEP COOLED CCD
- >95% QE
- Low dark current
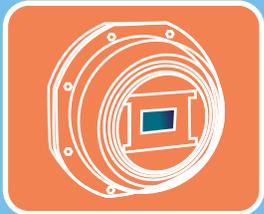
eXcelon™
- Eliminates etaloning
- Improves QE
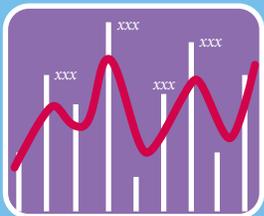
IntelliCal®
- Automated calibration
- NIST traceable ref. light sources
- Intensity and wavelength calibration
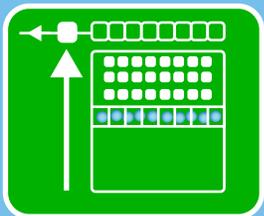
FAST DATA COLLECTION
- Dual readout ports
- Frame transfer
- Kinetics mode
- Mechanical shutter disabled mode

Perfect for OEM & System Integrators

Superior SNR with a footprint of a notebook. IsoPlane 81 is ideal to be used as an OEM Spectrometer where it can be easily integrated with other optical systems for Raman microscopy; hyperspectral imaging; cryo or elevated temperature measurement; flow cytometry; and more.

IsoPlane 81 comes with Labview®, Matlab®, and Python® drivers for easy software development and system integration.

IsoPlane 81 Models

|	IsoPlane 81 BRX-VR	IsoPlane 81 BX-VR	IsoPlane 81 BRX-UR	IsoPlane 81 BX-UR
Sensor Type	Back-illuminated, deep-depletion, frame-transfer CCD with eXcelon™ technology and UV coating	Back-illuminated, frame-transfer CCD with eXcelon™ technology and UV coating	Back-illuminated, deep-depletion, frame-transfer CCD with eXcelon™ technology and UV coating	Back-illuminated, frame-transfer CCD with eXcelon™ technology and UV coating
Sensor Benefit	Enhanced NIR with >97% peak QE	Ultra-low dark current for long exposure experiment	Enhanced NIR with >97% peak QE	Ultra-low dark current for long exposure experiment
Spectral Range (nm)	400 - 1100	400 - 1100	200 - 1100	200 - 1100
Spectral Rate (burst mode)	>10,000 spectra/sec	>5,000 spectra/sec	>10,000 spectra/sec	>5,000 spectra/sec

Family Specifications

Focal Length	81 mm	
Aperture Ratio	f/4	
Spectral Resolution (FWHM)*	0.1 nm	
Spectrograph Optics & Spectral Range	VR: Protected silver coating 400 – 1100 nm	UR: UV-enhanced aluminum coating 200 - 1100 nm
Spatial Resolution	38.5 lp/mm @ 50% contrast over entire focal plane (Nyquist limited)	
Grating	150 g/mm up to 4320 g/mm. User changable, rotatable single-grating turret	
Astigmatism/Coma Aberration	Zero at all wavelengths and grating angles over entire focal plane	
Slits	Slit width: 10 μm up to 500 μm; 3.3 mm tall; interchangable, laser-cut slits	
Camera	BRX	BX
Sensor Type	Back-illuminated, deep depletion, frame-transfer CCD sensor with eXcelon® and UV coating	Back-illuminated, frame-transfer CCD sensor with eXcelon® and UV coating
Sensor Format	1024 x 256 (1024 x 512 including frame-transfer storage area)	
Deepest Cooling Temperature	-55ºC guaranteed, -60ºC typical	
System Read Noise	4 e- @ 500 kHz; 6 e- rms @ 1 MHz; 27 e- @ 4.55 MHz	
Data Interface	USB 3.0 (3 m interface cable provided)	
Dimensions L x W x H	26.8 cm x 18.0 cm x 21.0 cm (11" x 7" x 8")	
Weight	8.84 kg (19.5 lbs)	

at 750 nm with 10 μm slit and a 1800 g/mm grating.

Specifications are subject to change.

BRX (Back-Illuminated, Deep-Depletion CCD) — BX (Back-Illuminated CCD)

Silver — Aluminum
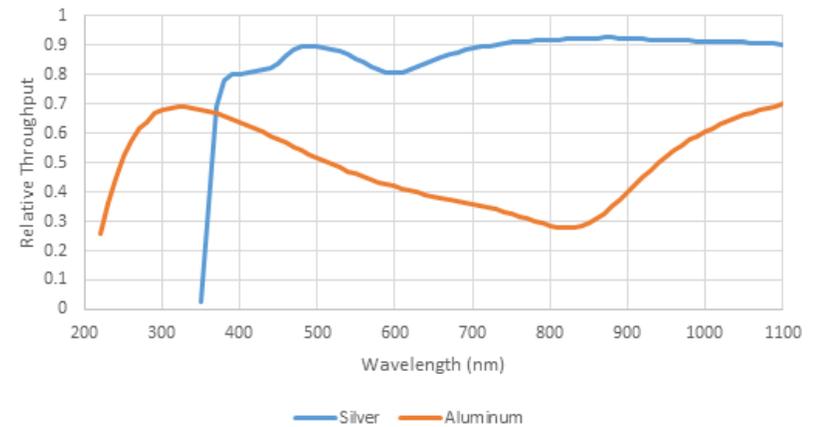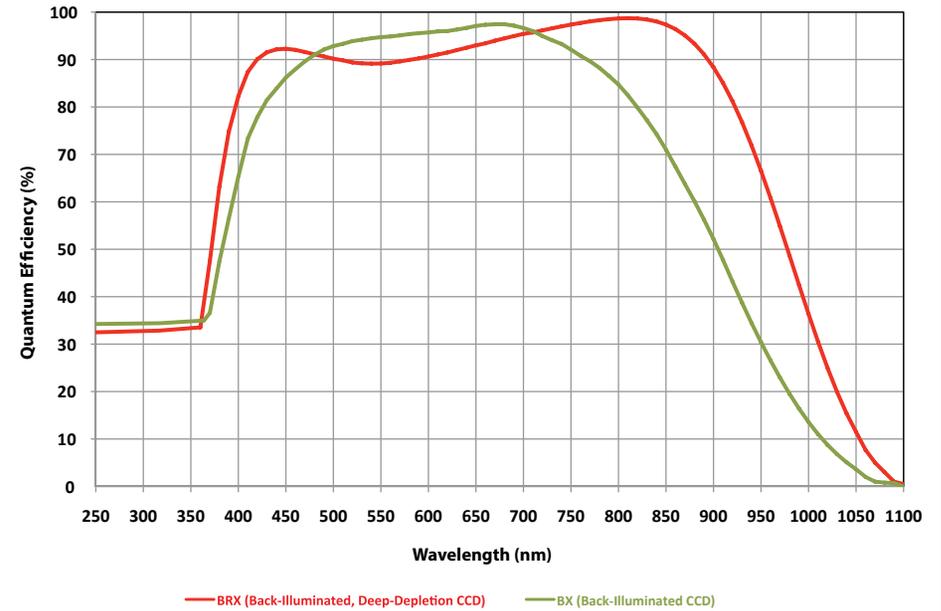
>95% QE

Ecosystem

IsoPlane 81 is much more than a spectrograph. Its meticulously engineered ecosystem is continually being expanded to support work in diverse fields. Fiber probes, accessories for Raman spectroscopy, and easy-to-use fiberoptics are just the beginning.

RAMAN MICROSCOPY

- CUBE-based standalone Raman microscope
- Compact footprint
- Built-in LED and witness camera

FIBER COUPLED PROBE

- Point-and-shoot
- Round-to-linear collection fiber bundle for best efficiency
- Fiber adaptor can accept different fiber input including customized probe

RAMAN MICROSCOPY

- Convert standard microscope to Raman microscope
- Plug-and-play
- Capable of confocal measurement

CUVETTE HOLDER CONFIGURATION

- Ideal for routine sample measurement
- Accepts standard 10 mm cuvette
- Maintenance-free

There's a CUBE for That!

CUBES

Lasers and calibration light sources

Designed for free space and fiber coupling

Pre-aligned (stays aligned as more CUBES are added)

With IsoPlane 81 CUBES & accessories, interfacing is a cinch!

If you've ever spent more time digging through cabinets than conducting your actual experiment, you'll definitely appreciate these CUBES.

Easy to attach using only a screwdriver

Compatible with Thorlabs® 30 mm cage system

User changeable slits and grating

And more...

Software

LightField Enables Better Outcomes

While IsoPlane 81 successfully distinguishes itself with innovative hardware, the beautifully designed LightField software orchestrates all inner workings and makes it a pleasure to use the system day in and day out!
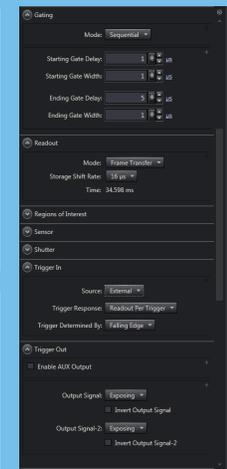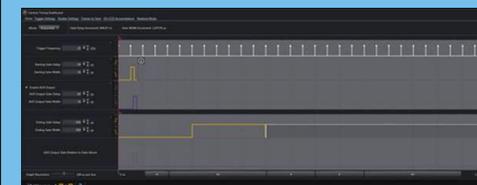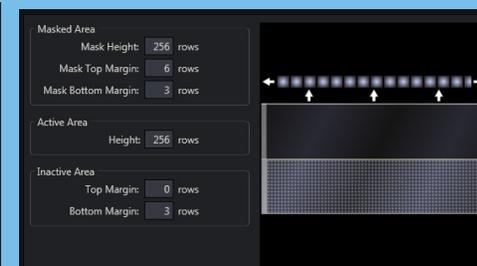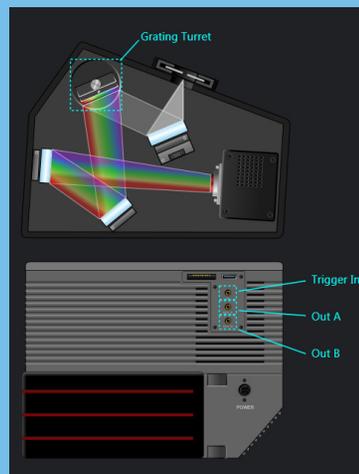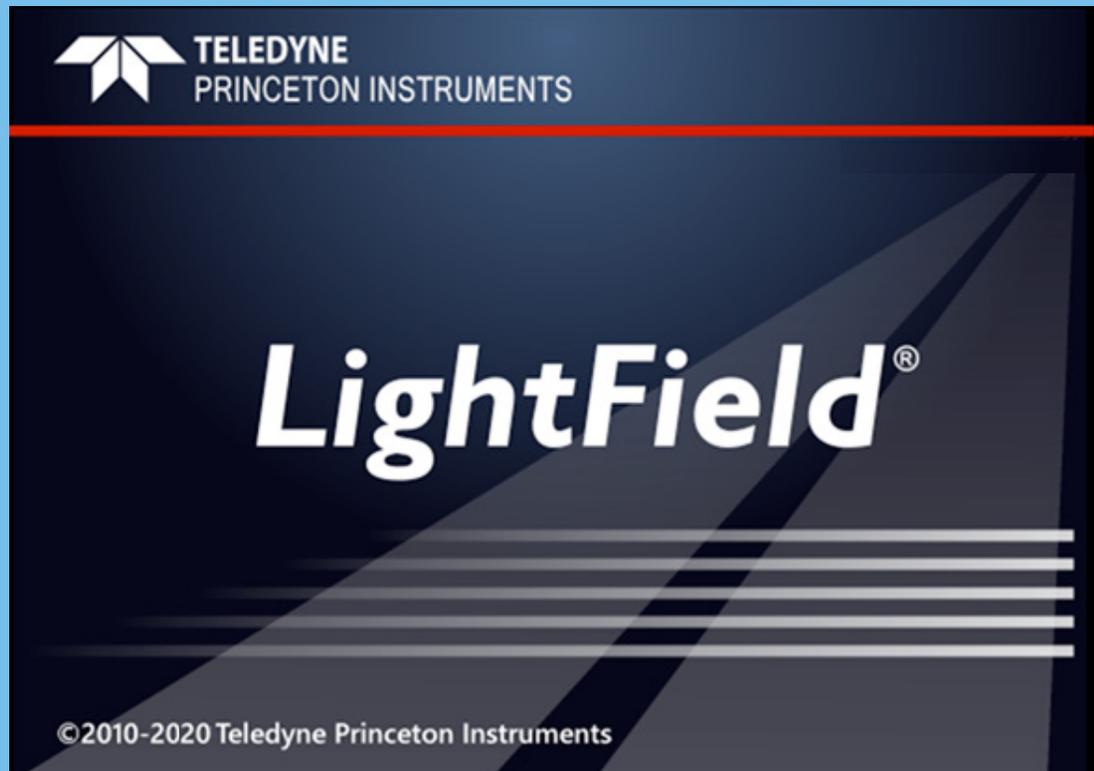
Dedication

Customer for Life

IsoPlane 81 users look at biological or physical processes using optical spectroscopy techniques. They may work at a university, a private company, or a government laboratory. They may be a scientist, an educator, or an engineer. Their level of experience as a spectroscopist may vary, too.

IsoPlane 81 ecosystem allows them to perform advanced spectroscopic research without needing to integrate countless third-party components. The aberration-free results yielded by the system's fully integrated hardware and software are worthy of peer review.

Customers are our Focus

Quality

Teledyne Princeton Instruments builds quality and reliability into every one of our products, including a lifetime warranty on vacuum systems.

Partnership

From Nobel laureates to Original Equipment Manufacturers (OEM), we dedicate ourselves to understanding the unique requirements of every customer.

Knowledge

Teledyne Princeton Instruments employs a diverse and knowledgeable staff from all disciplines and backgrounds.

Support

Our worldwide locations and experienced technicians support you before, during, and especially after the sale.

# Who We Are

3000+
employees worldwide

TELEDYNE TECHNOLOGIES
Everywhere**you**look™

When you partner with Teledyne Princeton Instruments, you become part of a world-class organization with diversified technologies and capabilities.

| Machine Vision | Scientific Imaging | MEMS | Healthcare | Astronomy & Earth | Geospatial |
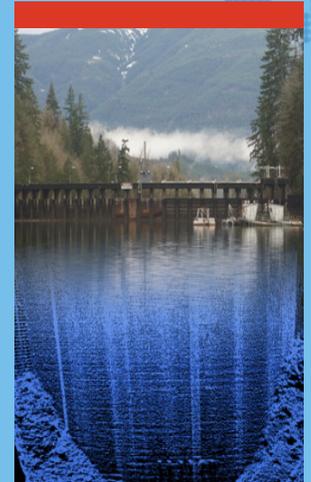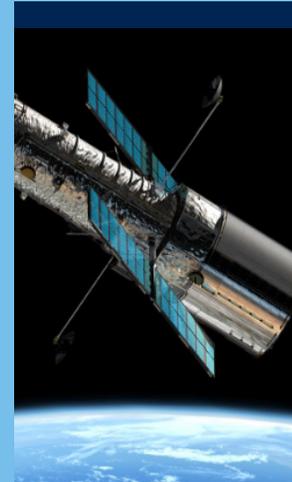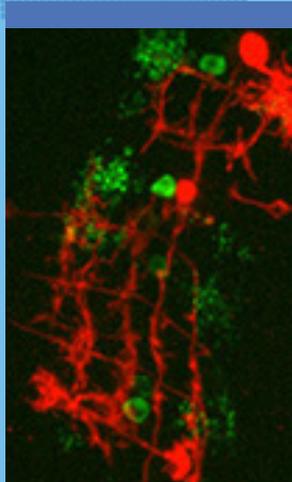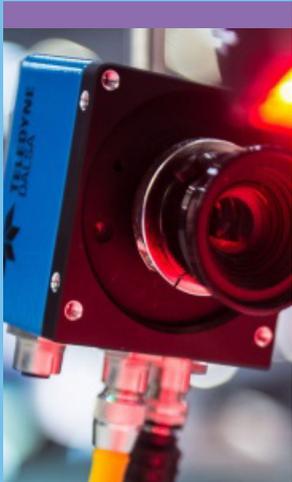
www.princetoninstruments.com
pi.info@Teledyne.com
+1 609.587.9797

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Part of the Teledyne Imaging Group