

ISOPLANE® 160 SPECTROMETER

KEY FEATURES

The best spectroscopy solution by any measure

- Astigmatism-free design
- Outstanding spatial and spectral resolution
- Higher signal-to noise than comparable instruments
- Fixed-position camera mount with μm focus adjustment
- Kinematic, torque-limiting turret mount
- High-efficiency optical coatings
- Compatible with a wide range of Teledyne Princeton Instruments cameras
- Wide range of optional accessories available

TYPICAL APPLICATIONS

- Spectroscopy
- Nanomaterial studies
- Tip-enhanced Raman Spectroscopy
- Solar cell analysis
- Wide-angle energy-momentum spectroscopy
- Micro-spectroscopy

RELIABILITY

- One-year warranty
- Repeatable spectral accuracy to a single pixel

Multi Award-Winning Imaging Spectrometer

The IsoPlane Family are the best imaging spectrometer in their class. With a unique optical design, IsoPlane completely eliminates astigmatism across the focal plane for superior multichannel capabilities. With fast optics and specialized mirror coatings it ensures maximum throughput and maximum signal-to-noise performance.

IsoPlane spectrometers have patented, astigmatism-free design at all wavelengths across the entire focal plane, with excellent spatial and spectral resolution. No other mirror-based scanned spectrometer offers comparable performance.

The model is the IsoPlane 160 spectrometer, with a compact footprint making it an ideal add-on for new and existing spectroscopy or microscopy systems. The IsoPlane 160 has a large $f/3.9$ input aperture, the widest spectral bandwidth, minimal optical aberrations and good multichannel performance.



SPECIFICATIONS

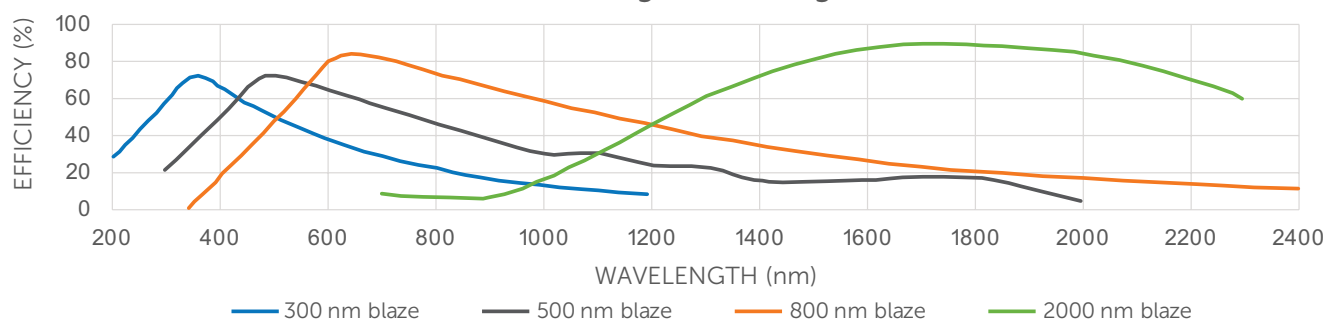
Features	IsoPlane 160
FOCAL LENGTH	203 mm
APERTURE RATIO	f/3.88
TYPICAL SPECTRAL RESOLUTION	0.13 nm with PMT <0.16 nm with CCD (across 27 mm wide focal plane) <0.07 nm with CCD and ResXtreme
RECIPROCAL LINEAR DISPERSION	3.61 nm/mm
WAVELENGTH COVERAGE	97 nm (nomial across 27 mm wide CCD)
FOCAL PLANE SIZE	27 mm (W) x 14 mm (H)
SCAN RANGE	0 to 1400 nm
DRIVE STEP SIZE	0.005 nm/step
WAVELENGTH ACCURACY	±0.2 nm (up to 0.02 nm with IntelliCal wavelength calibration)
WAVELENGTH REPRODUCIBILITY	±0.025 nm
TURRET	Interchangeable triple-grating CTS-Turrets self-align to system when installed
GRATING CHANGE REPEATABILITY	0.02 nm (typical)
GRATING SIZE	40 mm x 40 mm gratings
NUMBER OF TURRETS ALLOWED	Accepts as many as 3 turrets, each with 3 gratings
ASTIGMATISM	<100 µm at all wavelengths across entire focal plane
SPATIAL RESOLUTION (MTF)	≥12 line pairs/mm @ 50% modulation measured at focal plane center ≥6 line pairs/mm @ 50% modulation measured over 27 x 8 mm focal plane
COMPUTER INTERFACE	USB and RS-232
CERTIFICATION	CE tested to the following standards: EN 55022:2010/AC:2011, EN 61000-3-2:2014, EN 61000-3-3:2013, EN 61000-6-3:2007/A1:2011, EN 61326-1:2013
DIMENSIONS	299.7 x 248.9 x 218.4 mm (L x W x H)
WEIGHT	15 lbs, 6.8 kg
OPTICAL AXIS HEIGHT	5.0" to 5.875", 127 to 149.225 mm, adjustable
	Unless otherwise stated, specifications are with a 1200 g/mm grating @ 435.8 nm

IsoPlane 160 STANDARD GRATINGS*

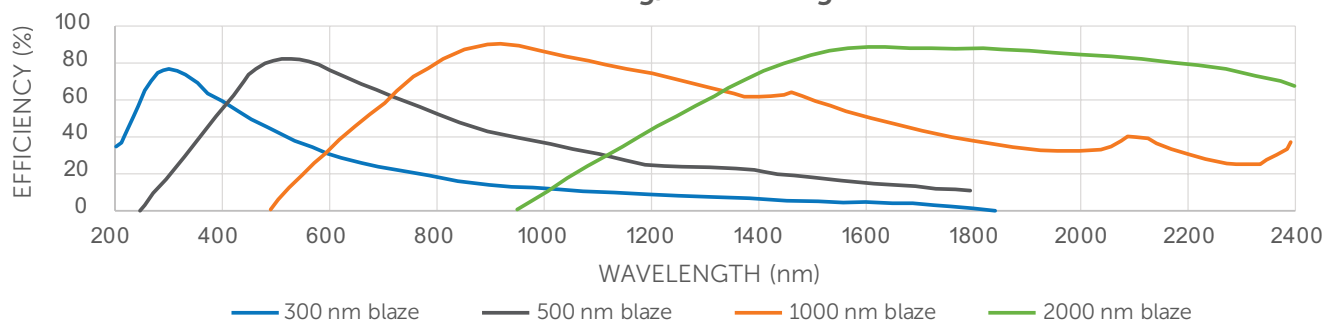
Groove density (g/mm)	Blaze wavelength (nm)	Mechanical scanning range	Optimum wavelength range (nm)		Grating part number IsoPlane 320/320A
50	600	0 - 36 μ m	402	950	i60-005-600-P
150	300	0 - 12 μ m	200	500	i60-015-300-P
150	500	0 - 12 μ m	330	800	i60-015-500-P
150	800	0 - 12 μ m	425	1400	i60-015-800-P
150	1250	0 - 12 μ m	850	2100	i60-015-1250-P
150	4000	0 - 12 μ m	2600	6000	i60-015-4000-P
300	300	0 - 6 μ m	200	500	i60-030-300-P
300	500	0 - 6 μ m	330	800	i60-030-500-P
300	750	0 - 6 μ m	500	1200	i60-030-750-P
300	1000	0 - 6 μ m	650	1600	i60-030-1000-P
300	1200	0 - 6 μ m	700	2100	i60-030-1200-P
300	2000	0 - 6 μ m	1300	4000	i60-030-2000-P
600	150	0 - 3 μ m	105	250	i60-060-150-P
600	300	0 - 3 μ m	200	500	i60-060-300-P
600	500	0 - 3 μ m	330	800	i60-060-500-P
600	1000	0 - 3 μ m	670	1600	i60-060-1000-P
600	1250	0 - 3 μ m	850	2100	i60-060-1250-P
600	1600	0 - 3 μ m	1050	2500	i60-060-1600-P
900	550	0 - 2 μ m	335	800	i60-090-550-P
900	NIR	0 - 2 μ m	700	1100	i60-090-HNIR-P
1200	150	0 - 1500 nm	105	250	i60-120-150-P
1200	300	0 - 1500 nm	200	700	i60-120-300-P
1200	500	0 - 1500 nm	325	1000	i60-120-500-P
1200	750	0 - 1500 nm	475	1500	i60-120-750-P
1200	850	0 - 1500 nm	525	1500	i60-120-850-P
1200	UV holo	0 - 1500 nm	200	450	i60-120-HUV-P
1200	VIS holo	0 - 1500 nm	400	1100	i60-120-HVIS-P
1800	500	0 - 1000 nm	330	800	i60-180-500-P
1800	UV holo	0 - 1000 nm	200	500	i60-180-HUV-P
1800	VIS holo	0 - 1000 nm	350	1000	i60-180-HVIS-P
2400	150	0 - 750 nm	105	250	i60-240-150-P
2400	240	0 - 750 nm	160	400	i60-240-240-P
2400	UV holo	0 - 750 nm	200	500	i60-240-HUV-P
2400	VIS holo	0 - 750 nm	250	750	i60-240-HVIS-P
3600	240	0 - 500 nm	160	400	i60-360-240-P
3600	UV holo	0 - 500 nm	200	500	i60-360-HUV-P
MIRROR	-	0 nm	-	-	i60-MIRROR-P

IsoPlane 160 GRATING EFFICIENCY CURVES

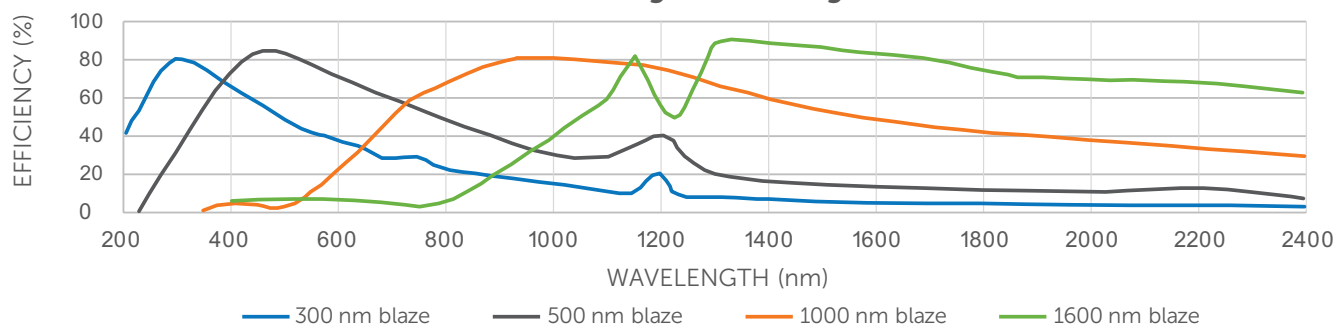
150 g/mm Grating



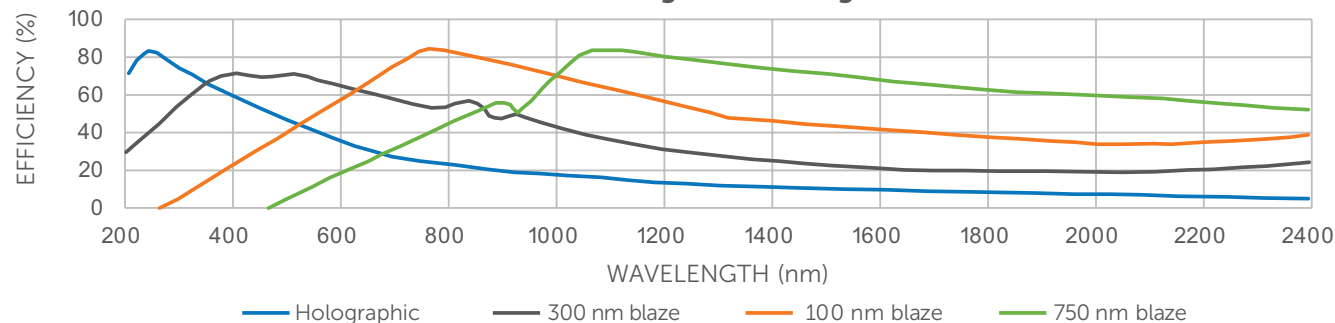
300 g/mm Grating



600 g/mm Grating



1200 g/mm Grating



IsoPlane 160 ACCESSORIES

Included	Compatible Teledyne Princeton Instruments Cameras
External power supply	The IsoPlane 160 is compatible with the following scientific-grade cameras from Teledyne Princeton Instruments:
USB A-B data interface cables	PIXIS, BLAZE®, PyLoN®, PyLoN-IR, NIRvana®, ProEM®-HS, PI-MAX®4, KUROS®
Grating turret	

Single-Channel Detector Accessories	Details
SpectraSense data acquisition software	Designed to control scanning monochromators, single-channel detectors, and related accessories.
SpectraHub detector interface/readout system	Required for operation of all single-point detectors (except those that require lock-in amplifiers). Requires SpectraSense software, a scanning monochromator, and a single-channel detector for operation.
Silicon detector/ UV-enhanced silicon detector	Two available, provided with housing, BNC connector and mounting flange, sensitive from 400-1100 nm.
Photomultiplier tube (PMT) detector	Three 1 1/8 side-window PMTs available, each requires a housing and power supply for operation. Sensitivity range as follows: P1 (190-650 nm); P2 (190-900 nm); P3 (300-1100 nm).
Integrated photon-counting detector system	Includes PMT, amplifier/discriminator, and built-in power supply, sensitive from 185-850 nm.
Solid state InGaAs detector (with cooling option)	Two InGaAs detectors available, each with pre-amplifier, sensitive from 800-1700 nm.

Light Input Accessories	Details
Fixed-position fiber adapter	FC and SMA-905 connectors available. Cannot be used with motorized slit assemblies.
Adjustable fiber adapter	Holds 10 mm diameter fiber bundles directly at entrance slit of IsoPlane. FC and SMA-905 available.
Universal fiber coupler	X-Y micrometer control, 3 mm of travel, interchangeable 10 mm diameter ferrule, SMA-905 connector, FC inserts and slit baffle.
Imaging fiber adapter	Refocuses fiberoptic input for filter wheels or other imaging devices. Accepts fibers with FC/PC, SMA 905 or 10 mm diameter ferrules, horizontal/vertical alignment capabilities, and 19 mm thick removable spacer
Raman filter chamber	For use of Raman or edge filters, chamber collects fibers and collimates the beam, second lens focuses the beam on IsoPlane entrance slit. Chamber includes adapter for 25.4 mm filters.
Sample chamber	Features ports with light-tight covers and two quartz lenses. Requires sample holder.

Fiberoptic Bundle Accessories	Details (custom fibers available on request)
Single-leg fiber bundles (190-1100 nm or 400 2200 nm wavelength ranges available)	x19 200 μ m fibers with SMA connector at illumination end and 10 mm ferrule at slit end. Fiber configuration is round at light input end and line (column) at output (slit) end. Available in 1 m or 3 m lengths.
Two-leg fiber bundle (190-1100 nm)	x7 200 μ m fibers per leg with SMA connector at illumination end and 10 mm ferrule at slit end. Fiber configuration is round at two light inputs and ends at line (column) at the common output end, with 1 mm spacing between fiber groups. Available in 1 m length.
Four-leg fiber bundle (190-1100 nm)	x3 200 μ m fibers per leg with SMA connector at illumination end and 10 mm ferrule at slit end. Fiber configuration is round at four light inputs and ends at line (column) at the common output end, with 1 mm spacing between fiber groups. Available in 1 m length.

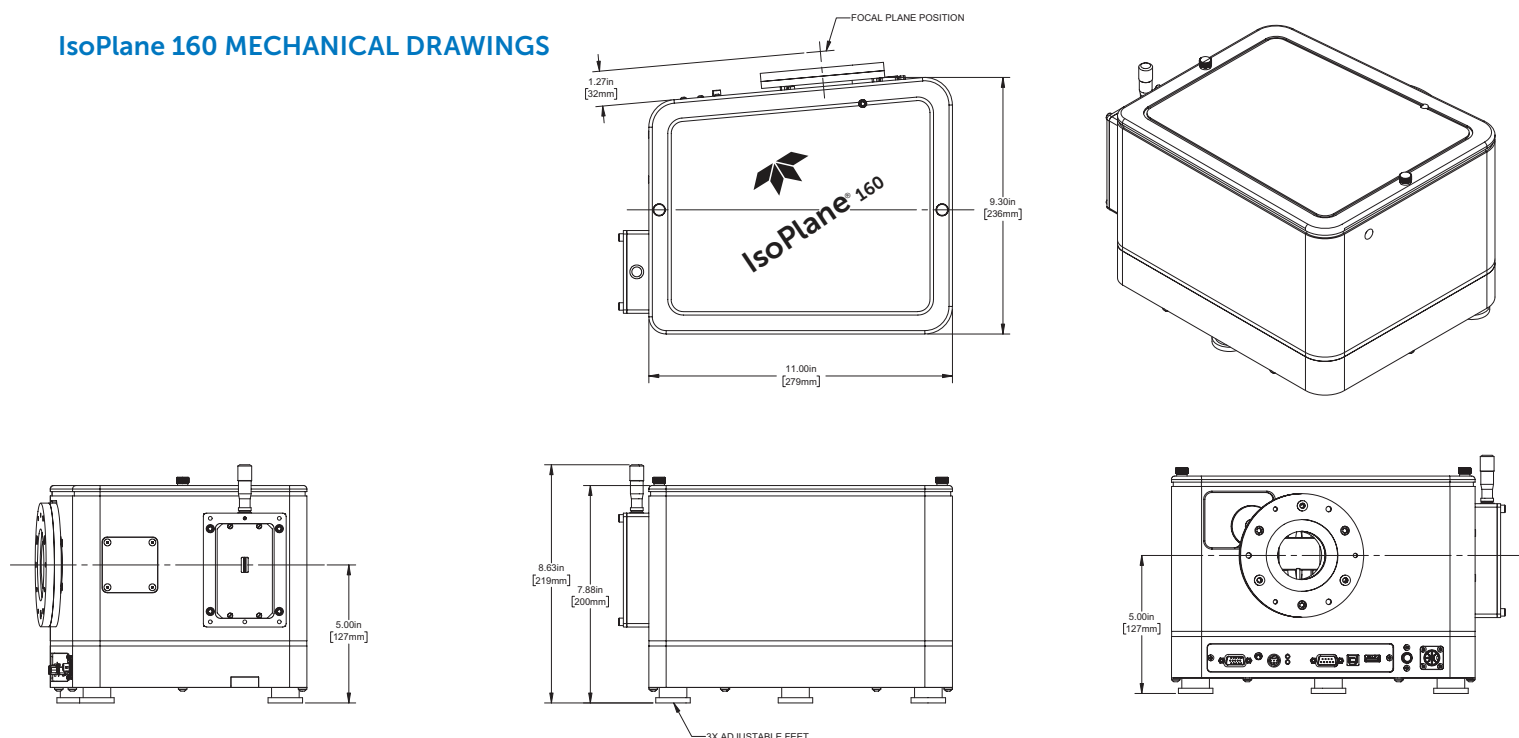
Light Source Accessories	Details (custom fibers available on request)
IntelliCal Atomic Emission (AE)	USB-powered light source useful for wavelength calibration. Includes Hg and Ne-Ar lamps and toggle switch.
Deuterium	30 W lamp provides ~190 to ~350 nm UV light, negligible visible light output. 110 or 220 V light source available
Quartz Tungsten-Halogen (QTH)	30 or 250 W QTH to output ~350 to >2500 nm light, with DC power supply. 250 W version also available cooled.
Deuterium and Tungsten-Halogen	30 W deuterium and TH lamps in same housing, output 190 to 2500 nm light, with cooling and 110/220 V power.
Xenon	75 W xenon lamp with small emission area. Output 190-750 nm bright, with declining output up to 2700 nm.

Filter Wheel Accessories	Details (custom fibers available on request)
Motorized Filter Wheel Assemblies	Six-position filter wheel for 1 inch (25.4 mm) diameter samples with stepping motor, controller, and RS-232 interface for computer-controlled filter indexing. Filters not included.
Filter set	Standalone filter set including 320, 590, 665 and 715 nm FA series of filters.

IsoPlane 160 CUBE ACCESSORIES

CUBEs (Part Numbers)	Compatible Teledyne Princeton Instruments Cameras
CAGE-SPEC	Adapter plate and 30 mm cage mount to entrance slit
SPEC-CUBE1-UV SPEC-CUBE1-VIS SPEC-CUBE1-NIR	Focusing CUBES, contain achromatic doublet for focusing incoming light onto slit and precision X-Z stage for fine focus and slit alignment. Optimized for UV (250-425 nm); VIS (400-700 nm); or NIR (650-1050 nm)
SPEC-CAL-QTH	QTH calibration lamp, allows automated relative intensity calibration, stabilized optical output, NIST traceable, with a USB interface
SPEC-CUBE2-785	Contains mounted 785 nm narrowband laser line filter, PI long-pass dichroic filter (127 cm ⁻¹ edge) and matching edge filter (OD 6) with precision built-in angle tuning. Optimised for Raman spectroscopy.
SPEC-CUBE3	Contains sample chamber for 12.5 mm cuvette (not included) and light cover, with 2 lenses and 4 optical ports
SPEC-CUBE4-50 SPEC-CUBE4-70 SPEC-CUBE4-90	Beam splitter CUBES, contains precisely aligned and mounted non-polarizing cubic beam splitter. Allows splitting of beam paths in either 50:50; 70:30 or 90:10 optical ratios respectively, without beam walk off
SPEC-CUBE5	Filter CUBE, three-positions for ½-inch diameter filters (filters not included)
SPEC-FIBER-LAS	Laser excitation fiber, 105 µm multimode fiber for coupling excitation light from laser
SPEC-FIBER-PTH	Fiber patch cable, 400 µm multimode fiber for coupling light from QTH lamp for absorption/transmission spec
SPEC-LAS-785	Wavelength-stabilized multimode 785 nm laser, fiber coupled, 475 mW power, narrow laser line, ideal for Raman

IsoPlane 160 MECHANICAL DRAWINGS



FOR MORE INFORMATION REACH OUT ONLINE:

CONTACT US: www.princetoninstruments.com/contact
 FOR OEM ENQUIRIES: www.princetoninstruments.com/oem
 CONTACT SUPPORT: www.princetoninstruments.com/contact-support

Teledyne Princeton Instruments is a registered trademark.

Specifications in this datasheet are subject to change. Refer to the Teledyne Princeton Instruments website for most current specifications. © 2025 Teledyne Princeton Instruments.

Revision Number:
Revision Date: 2025 12 10