Innovative Photonic Solutions

Innovative Photonic Solutions, Inc. ■ 4250 U.S. Highway 1, Suite 1
Monmouth Junction, NJ 08852 ■ Phone: (732) 355-9300 ■ Fax (732) 355-9302
sales@innovativephotonics.com ■ http://www.innovativephotonics.com

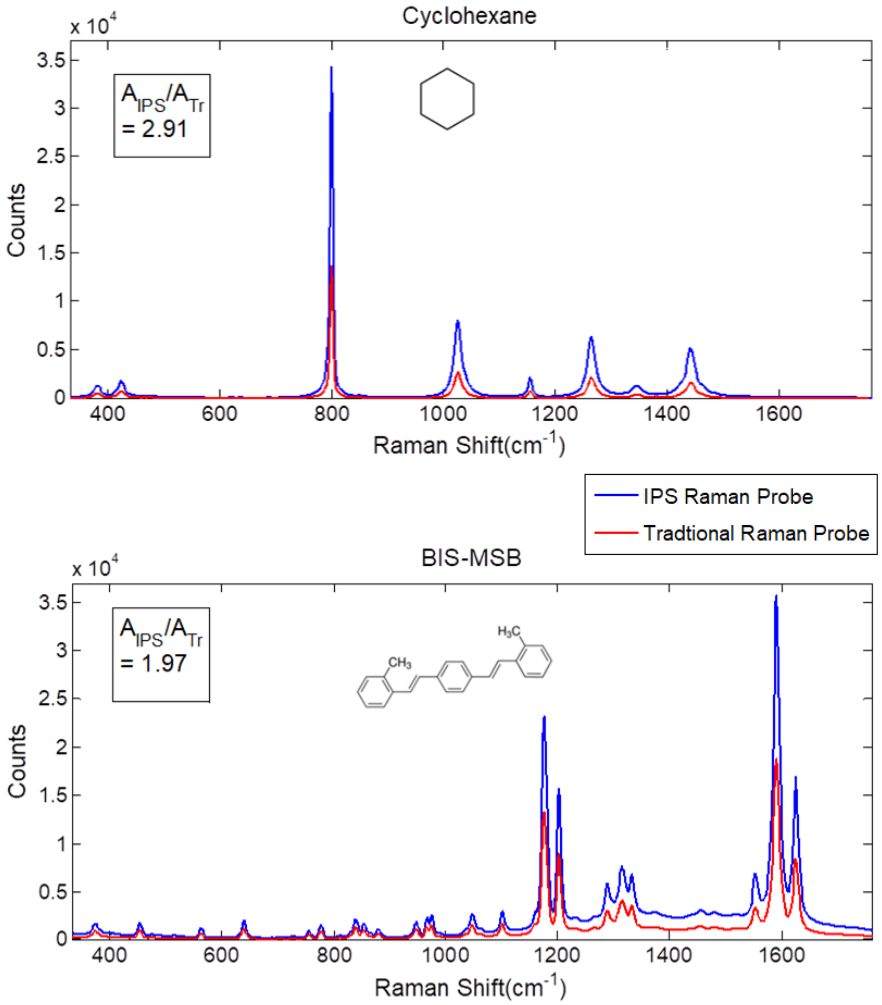
Turn-key Integrated Raman Probe

Features

- 2-3X Higher Throughput than Standard Raman Probes (sample dependent)
- 785 nm Standard Wavelength Stabilized Excitation Source
- Single-mode TEM_{00} or Narrow Linewidth Multi-mode options
- High Throughput Optical Design with 200cm^{-1} Cut-on
- User-Friendly Ergonomic Design
- Removable Distance Regulator† for Easy Sampling
- OEM Version Available (ask about this option)

Innovative Photonic Solutions (IPS) is proud to introduce an ultra-high throughput Integrated Raman Probe. This novel device includes an integrated wavelength stabilized laser source with Raman filter packs, beam shaping optics and high efficiency Raman spectra collection optics. The probe interfaces with any fiber coupled spectrometer and simplifies operation and set-up.

The Integrated Raman Probe incorporates our wavelength stabilized hybrid external cavity laser (HECL) with a proprietary optical design to offer unmatched performance (typically 2 – 3X higher collection efficiency over traditional Raman probes). IPS's Integrated Raman Probe also comes complete with a UL/CE, and IEC certified control box - providing a variety of power control options including modulation capability (TTL & analog) and a USB computer interface.



† – Distance regulator available only for 9 mm working distance. 9 mm working distance is optimal if using IPS sample holder.

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Integrated Raman Probe Technology & Specifications

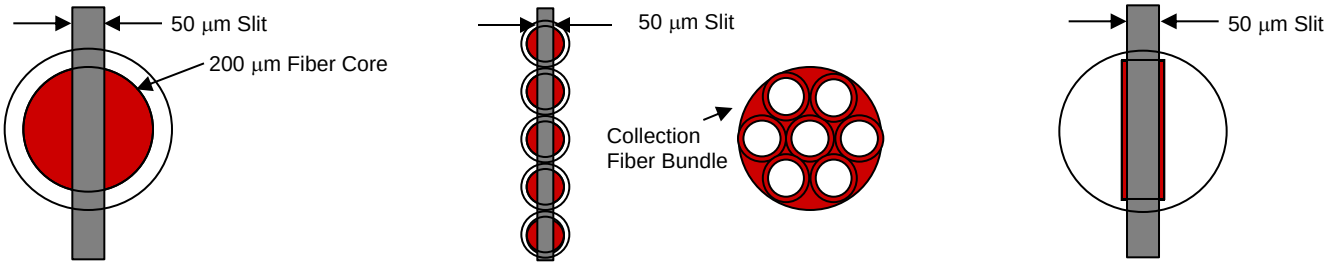
Underlying Technology

IPS's Integrated Raman Probe offers higher collection efficiency as compared to traditional fiber probe approaches by optimizing the probe design in the following manner:

- IPS integrates the laser directly inside the probe head eliminating fiber coupling losses and allows for beam shaping in order to optimize both laser power and power density on the sample which maximizes Raman signal.
- IPS utilizes a custom designed rectangular core collection fiber which increases the coupling efficiency into both the fiber and the spectrometer.

Comparison of Loss at Fiber/Slit Interface & at Entrance to Collection Fiber (circle to line)

Circle to Line Collection



Raman signal is vignetted (thrown away) or not collected in red shaded regions detailed above

Parameter	Unit
Excitation Options	Multi-mode 785 nm wavelength stabilized laser <0.15 nm FWHM bandwidth (0.1 nm typical)
	Multi-mode 785 nm wavelength stabilized laser <0.1 nm FWHM bandwidth (0.07 nm typical) Ask about this option
	Single-mode 785 nm TEM00 wavelength stabilized laser < 100 MHz FWHM bandwith
Collection	1.5 m long proprietary high throughput fiber
Cut-on	200 cm-1 cut-on
Electronic Connection	DB9 cable with safety interlock
Power Control	Manual power adjustment knob, Analog / TTL modulation via BNC connector, or MicroUSB
Power Supply	3 - 5 A max, 5VDC
Shaft Material	316L Stainless Steel
Fiber Bend Radius	6 inches
Working Distances	4 mm (+/- 0.5 mm), 7.2 mm (+/- 0.5 mm), 9 mm (+/- 0.5 mm), and 16.1 mm (+/- 1mm) standard Custom distances available upon request
Operating Temperature	15 degrees C to 35 degrees C
Storage Temperature	- 20 degrees C to + 80 degrees C
Humidity	0 - 80% non-condensing

Parameter	Unit	Min	Typ	Max	Notes
Output power stability	%		± 1		Timescale dependent
Wavelength Tolerance	nm	-0.5		+0.5	From center wavelength
3 dB bandwidth (FWHM)	nm		0.1	0.15	Multi-mode Standard Spectral Linewidth
	MHz		50	100	Single-mode
Operating Temperature Range (Case)	Deg C	15		35	Case Temperature
Power Consumption	W		3	7	Case temp between 15 and 35 deg C
Wavelength Stability	Seconds			180	Cold Start - to < 1 wavenumber
				1	Warm Start - to < 1 wavenumber
				3	Warm Start - to < 0.1 wavenumber

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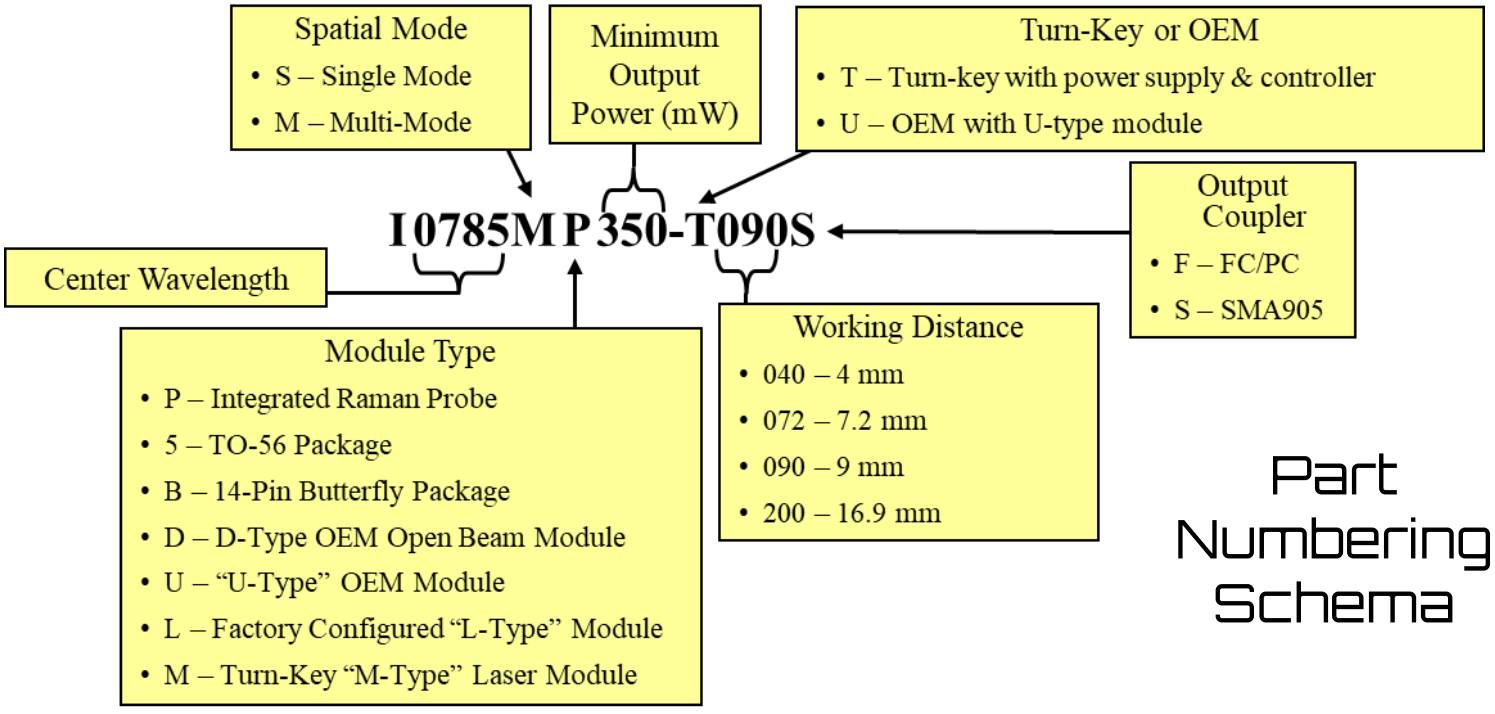
Standard 785 nm Integrated Raman Probes

Wavelength (nm)	Min. Power (mW)	Laser Type	Connector	Working Distance	Part Number (P/N)
785	100	Single-Mode (TEM_{00})	SMA 905	4 mm +/- 0.5 mm	I0785SP100-T040S
				7.2 mm +/- 0.5 mm	I0785SP100-T072S
				9 mm +/- 0.5 mm	I0785SP100-T090S
				16.6 mm +/- 1 mm	I0785SP100-T200S
			FC/PC (Narrow Key)	4 mm +/- 0.5 mm	I0785SP100-T040F
				7.2 mm +/- 0.5 mm	I0785SP100-T072F
				9 mm +/- 0.5 mm	I0785SP100-T090F
				16.6 mm +/- 1 mm	I0785SP100-T200F
785	350	Multi-Mode	SMA	4 mm +/- 0.5 mm	I0785MP350-T040S
				7.2 mm +/- 0.5 mm	I0785MP350-T072S
				9 mm +/- 0.5 mm	I0785MP350-T090S
				16.6 mm +/- 1 mm	I0785MP350-T200S
			FC/PC (Narrow Key)	4 mm +/- 0.5 mm	I0785MP350-T040F
				7.2 mm +/- 0.5 mm	I0785MP350-T072F
				9 mm +/- 0.5 mm	I0785MP350-T090F
				16.6 mm +/- 1 mm	I0785MP350-T200F
785	450	Multi-Mode	SMA	4 mm +/- 0.5 mm	I0785MP450-T040S
				7.2 mm +/- 0.5 mm	I0785MP450-T072S
				9 mm +/- 0.5 mm	I0785MP450-T090S
				16.6 mm +/- 1 mm	I0785MP450-T200S
			FC/PC (Narrow Key)	4 mm +/- 0.5 mm	I0785MP450-T040F
				7.2 mm +/- 0.5 mm	I0785MP450-T072F
				9 mm +/- 0.5 mm	I0785MP450-T090F
				16.6 mm +/- 1 mm	I0785MP450-T200F



Part Numbering Schema

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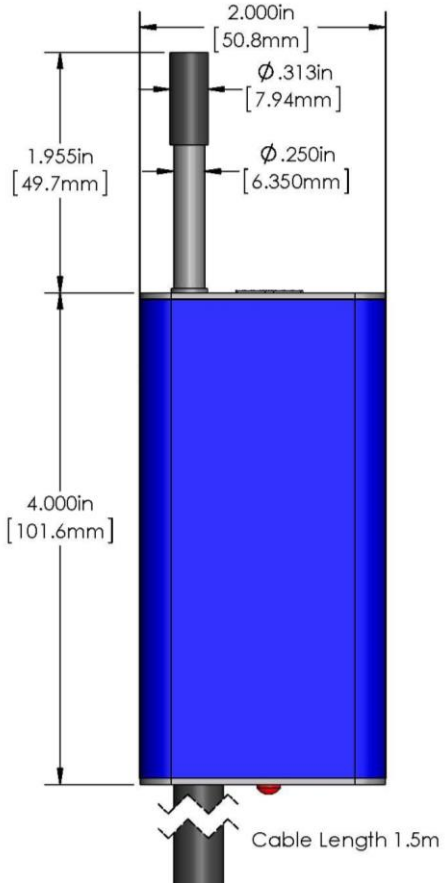
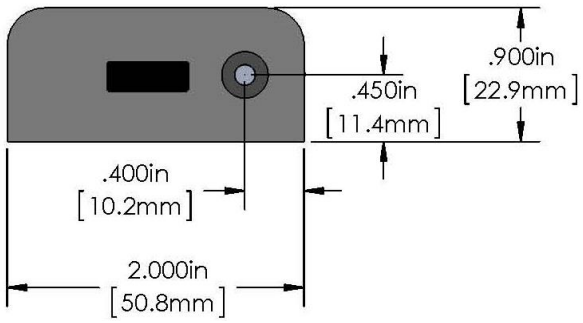
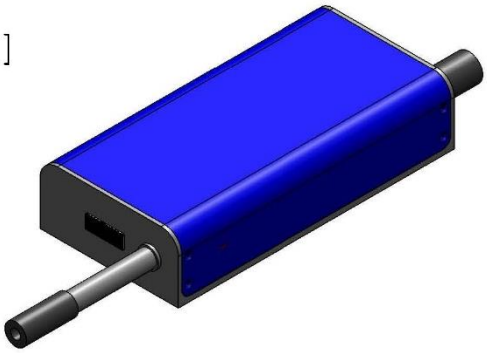
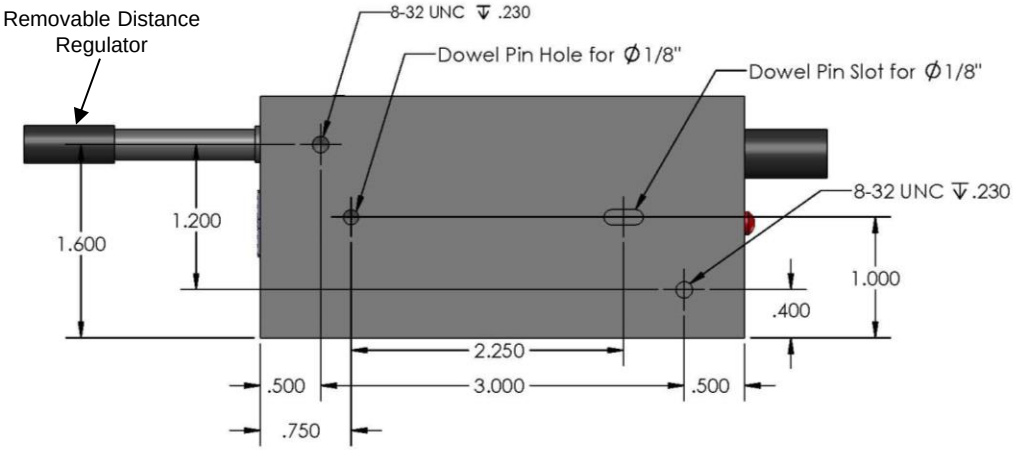
Mechanical Specifications Integrated Raman Probe

Probe Head

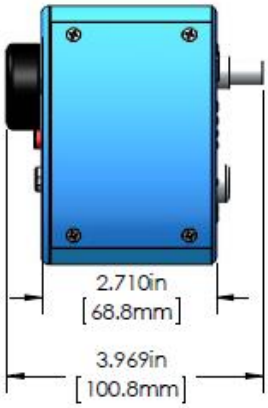


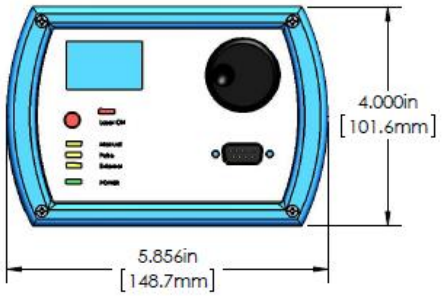


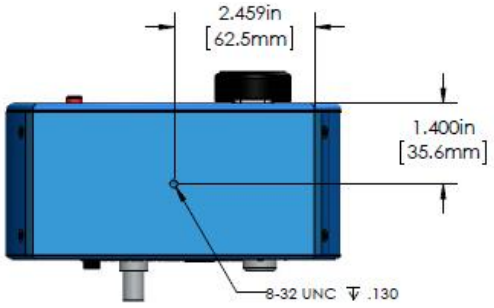




Control Module







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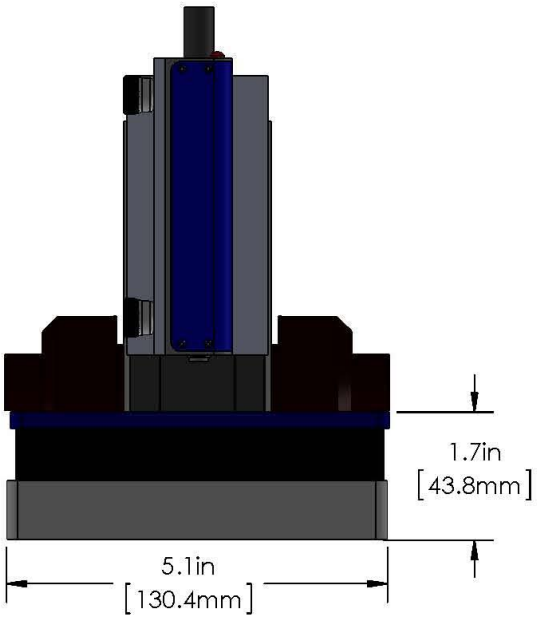
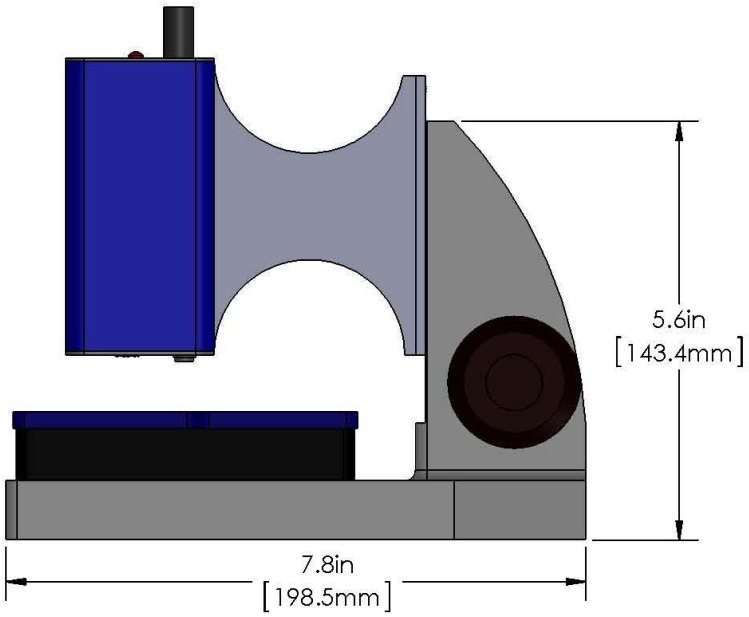
XYZ Stage

- Manually adjustable X-Y-Z stage for use with IPS 785nm integrated Raman probe
- Comes standard with specialized lens tube for use with IPS Integrated Raman Probe and XYZ Stage
- The Z adjust allows for precise focusing of laser on the sample, while the X-Y adjust allows for easy sampling of multiple points object
- The stage allows for 30mm of travel in X and Y
- Minimal assembly required, screws included

Integrated Raman Probe (pictured below) purchased separately





Dimension	Travel
XY	30mm
Z	25mm

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TITLE: XYZ-Stage
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES
ECCN: ECCN EXCEPTION:

DWG. NO. 1401A900_XYZ-StageAssembly_RevC

SHEET 1 OF 1

	Drawn	Date	MFG Eng	Date	Design ENG	Date
	J.Gannon	06-10-2015			J.Gannon	06-10-2015

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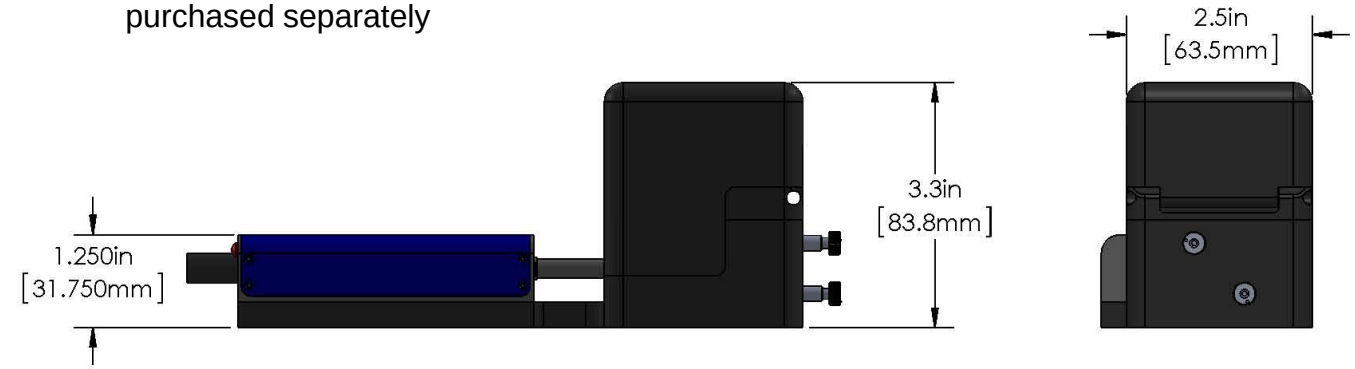
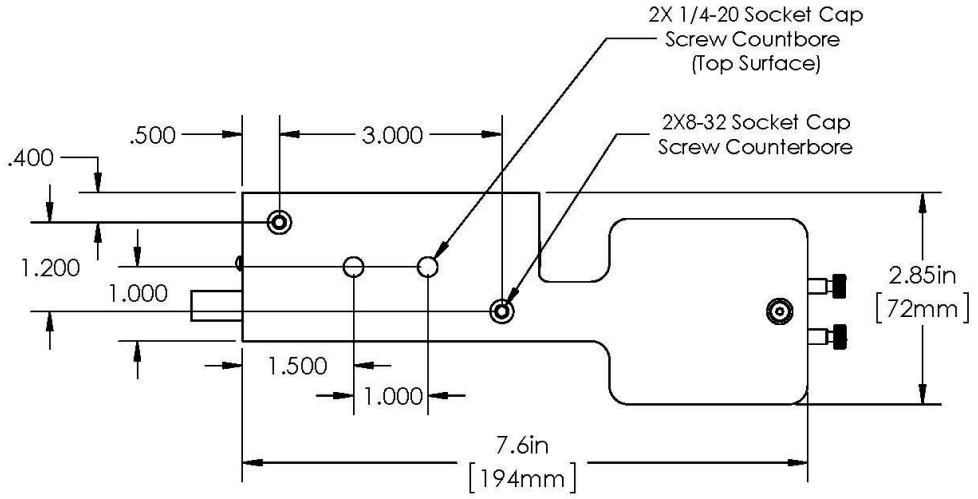
Double-Pass Liquid Sample Holder

- Double-pass liquid sample holder is meant for use with IPS Integrated Raman Probe (IRP) with standard 40.5mm long lens tube with 9mm working distance lens
- Light tight liquid sample holder with Innovative sampling chamber containing an adjustable gold coated mirror increasing signal collection by 3X
- Liquid Sample Holder will give additional 3X higher throughput when IRP and double-pass mirror is used
- Liquid sample holder will be compatible with most common cuvette and vial sizes

Integrated Raman Probe (pictured below)
purchased separately





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