

Shamrock SR-500i

Features, benefits & applications

Direct and responsive software interactivity:

The user can fully control all of the spectrograph functions including: wavelength control and calibration, grating selection, shutter control, slit control and filter selection

Image correcting toroidal optics

Enables maximum light throughput and multi-track spectroscopy with multiple fibre inputs

Pre-aligned detector/spectrograph solution

Enables fast, efficient experimental set-up

Interchangeable triple grating turret

Provides a simple, accurate and flexible way for the user to optimise wavelength coverage & resolution

USB interface

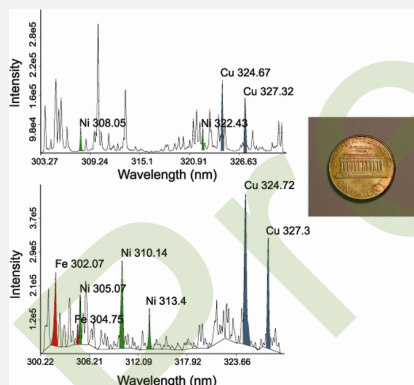
Enables the user to benefit from "Plug and Play" convenience

Wide range of accessories available

Includes optical fibres and adaptors, motorized filter wheel, motorized slit & manual slit

Typical Applications

- Absorption Transmission Reflection spectroscopy (ATR)
- Coherent Anti-Stokes Raman spectroscopy (CARS)
- Fluorescence Resonance Energy Transfer (FRET)
- Laser Induced Breakdown Spectroscopy (LIBS)



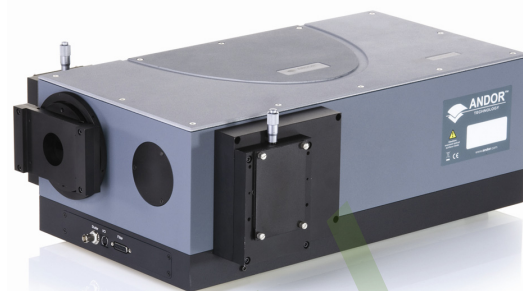
LIBS spectral analysis of a 1 cent US coin.

- Laser Induced Fluorescence (LIF)
- Plasma studies
- Raman micro-spectroscopy
- Single & 2-Photon spectroscopy

"High sensitivity spectroscopy detection solution"

The Andor Shamrock SR-500i is the latest addition to the Andor family of spectrographs based on the Czerny-Turner optical design.

The SR-500i is available as a pre-aligned detector/spectrometer option allowing for seamless integration of software, electronics, optics and detector.



There is also a fast and interactive graphical software interface allowing full control of all the spectrograph functions.

Spectrograph overview

Czerny-Turner arrangement with imaging toroidal optics	
Aperture	f/6.5
Focal Length (mm)	500
Focal plane size (mm, W x H)	28 x 14
Mechanical scan range (nm)	0 to 1200
Reciprocal dispersion (nm/mm, nominal)*	1.7
Stray Light* (measured at 20nm from 633nm laser line)	1.5x10 ⁻⁴
Wavelength accuracy (nm)*	± 0.2
Wavelength reproducibility (nm)*	± 0.05
Wavelength resolution (nm)*	0.05 in monochromator mode with 10µm output slit width (0.1nm with 26µm pixel CCD detector)

* Typical specifications obtained with a 1200 l/mm grating and 10µm slits at 435.8nm

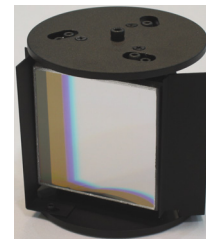
Slit	
Type	10µm to 3mm, manual as standard (motorised option also available)
Height options	4, 6, 8 or 14mm available
Gratings	
Size	68 x 68 mm
NOTE: Please see the next page for a full list of available gratings	
Shutter Specifications	
Maximum Repetition Rate	2 Hz
Minimum open/close time	15 ms
Minimum lifetime	100K cycles

Grating Turret

The optical engine of the SR-500i is an innovative triple grating turret, designed to offer flexibility and control over your choice and interchange of gratings. The triple grating turret can be easily and speedily removed, and replaced by an alternative turret with new gratings. The intelligent design of the SR-500i means that only a simple offset adjustment is required once the new turret and gratings are added.

For added flexibility the SR-500i is shipped with the grating turret already in place, ensuring your system is ready for use straight out of the box.

Additional grating turrets are available with up to three pre-installed gratings (see below for details). If the grating you require is not on the list, please contact Andor for further details



Grating Options

Lines/mm	Blaze (nm)	Recommended Spectral Region (nm) >20%	Nominal Dispersion (nm/mm)	Bandpass (nm) †	Resolution @546 nm*	Peak Efficiency (%)	Andor Part Number
150	300	200 - 800	13.10	362	0.53	72	SR5-GRT-0150-0300
150	500	350 - 1200	13.14	363	0.53	73	SR5-GRT-0150-0500
150	800	650 - 950	13.19	364	0.53	80	SR5-GRT-0150-0800
150	1250	1100 - 1500	13.24	366	0.54	84	SR5-GRT-0150-1250
150	2000	1600 - 2100	13.30	367	0.54	88	SR5-GRT-0150-2000
300	300	230 - 700	6.58	182	0.27	88	SR5-GRT-0300-0300
300	500	275 - 900	6.61	182	0.27	81	SR5-GRT-0300-0500
300	1000	500 - 1800	6.65	184	0.27	72	SR5-GRT-0300-1000
300	1200	1000 - 1400	6.66	184	0.27	92	SR5-GRT-0300-1200
300	1700	1500 - 1900	6.65	183	0.27	89	SR5-GRT-0300-1700
600	300	200 - 650	3.31	91	0.13	84	SR5-GRT-0600-0300
600	500	300 - 1050	3.33	92	0.13	72	SR5-GRT-0600-0500
600	1000	850 - 1200	3.31	91	0.13	72	SR5-GRT-0600-1000
600	1200	1200 - 1400	3.28	90	0.13	88	SR5-GRT-0600-1200
600	1900	1700 - 2000	3.04	84	0.12	88	SR5-GRT-0600-1900
1200	300	200 - 600	1.66	46	0.07	72	SR5-GRT-1200-0300
1200	500	250 - 800	1.65	46	0.07	81	SR5-GRT-1200-0500
1200	1000	1000 - 1500	1.49	41	0.06	69	SR5-GRT-1200-1000
1200	Holographic	400 - 1200	1.59	44	0.06	68	SR5-GRT-1200-EH
1800 [‡]	Holographic	190 - 900	1.05	29	0.04	70	SR5-GRT-1800-DH
1800 [‡]	Holographic	350 - 1100	1.02	28	0.04	62	SR5-GRT-1800-FH
2400 [‡]	300	200 - 800	0.82	23	0.03	68	SR5-GRT-2400-0300
2400 [‡]	Holographic	190 - 800	0.75	21	0.03	68	SR5-GRT-2400-BH
2400 [‡]	Holographic	250 - 600	0.78	22	0.03	73	SR5-GRT-2400-GH

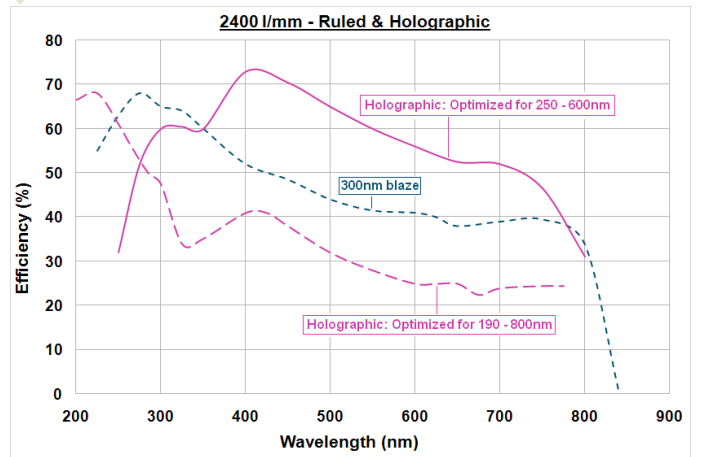
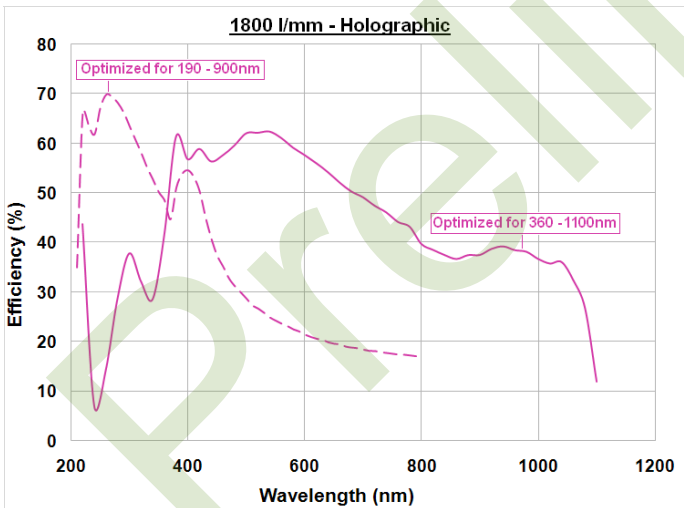
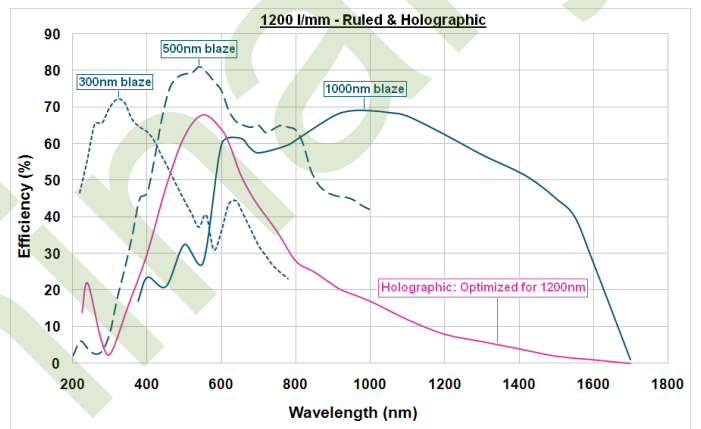
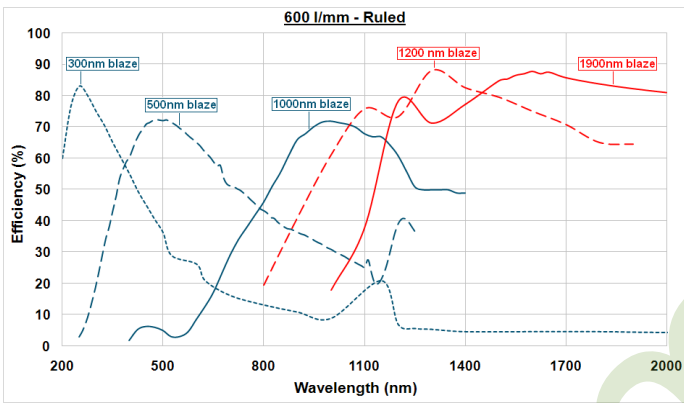
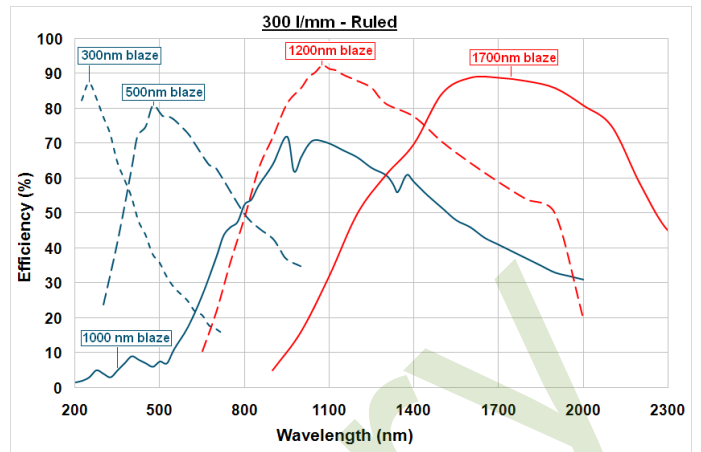
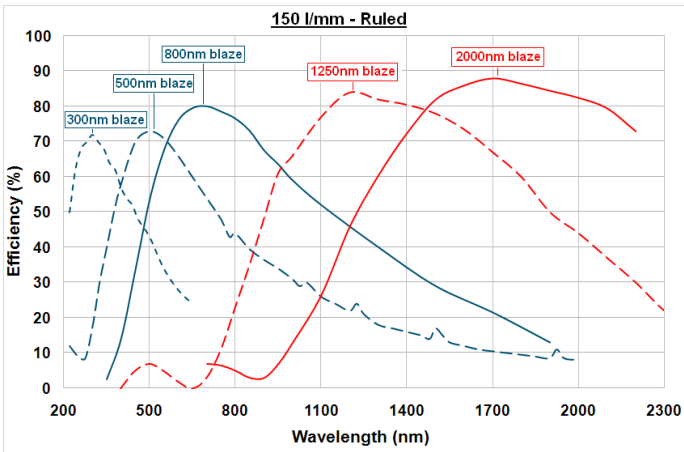
† Measured with 27.6mm wide CCD

* Resolution measured with 10 μm slit and 13.5 μm pixel size CCD

‡ Maximum wavelength attainable for each grating shown on next page for maximum wavelength attainable for each grating

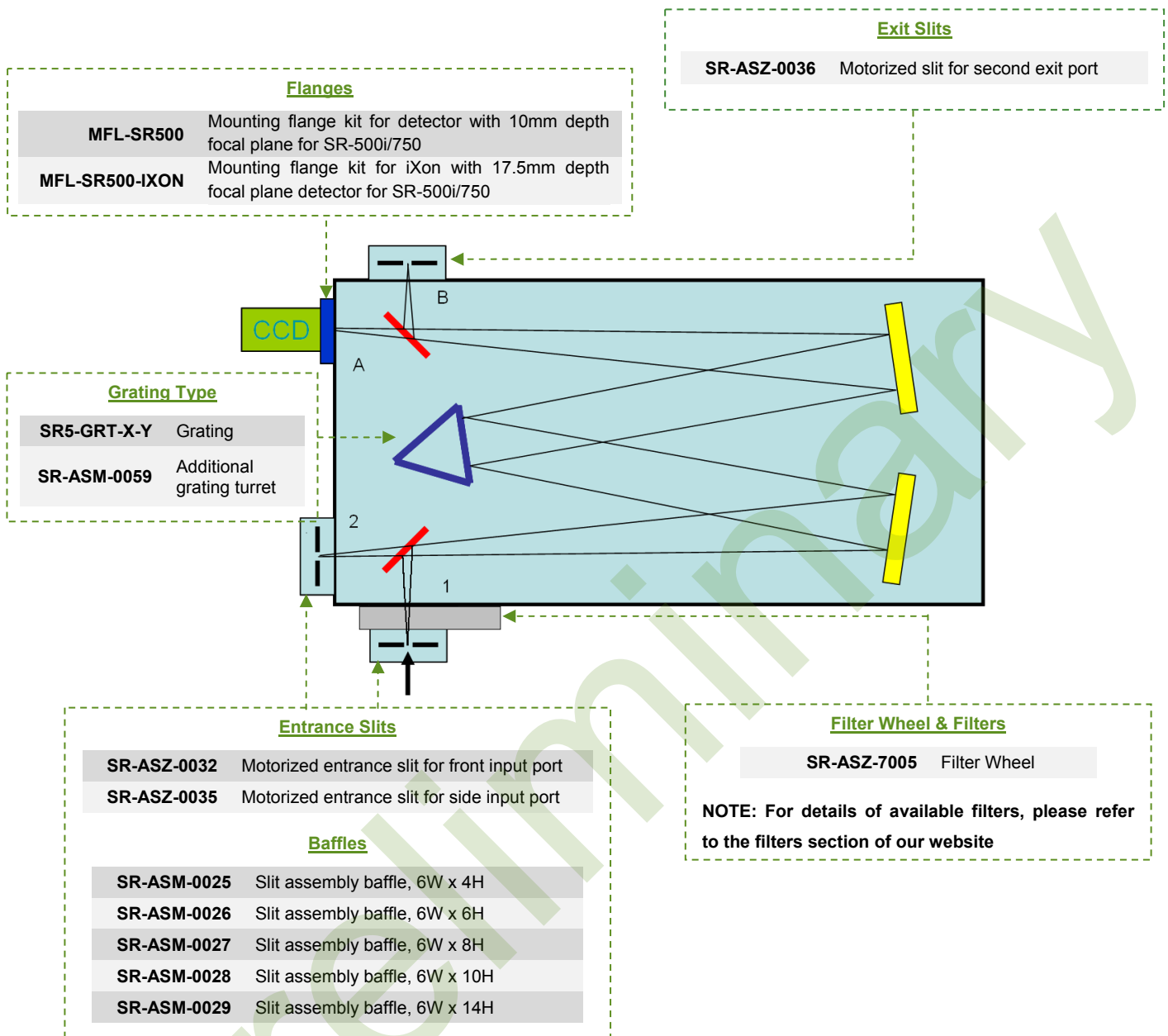
** For 2400 l/mm grating resolution measured @ 435nm

Grating Efficiency Curves⁵

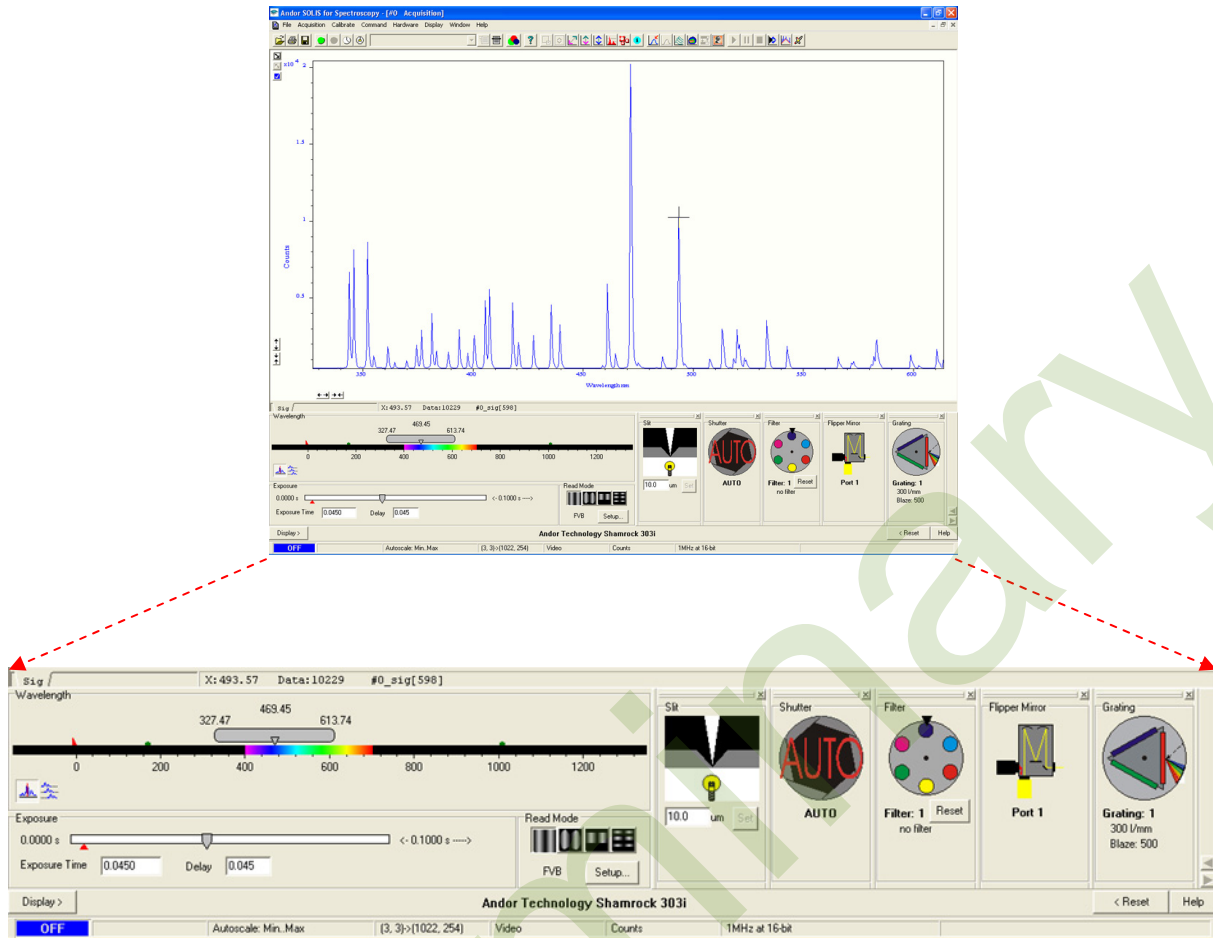


Maximum attainable wavelength for a given grating	
Grating	Maximum λ (nm)
150	11300
300	5650
600	2830
1200	1410
1800	940
2400	700

External accessory locations & internal light path



Software Interface



The easy-to-use graphical user interface shown above allows you to control many of the main spectrograph functions including the following:

- **Wavelength selection**
- **Slit control**
- **Shutter control**
- **Filter selection**
- **Exit Ports selection**
- **Grating selection**

Shamrock SR-500i

spectroscopy

Ordering information

To order this spectrograph please quote one of the following model numbers:

SR-500i-A	Spectrograph, manual single entrance slit, CCD exit port, triple grating turret
SR-500i-B1	Spectrograph, manual single entrance and exit slits, motorized exit mirror, CCD exit port, triple grating turret
SR-500i-B2	Spectrograph, manual single entrance slit, motorized exit mirror, dual CCD exit port, triple grating turret
SR-500i-C	Spectrograph, manual double entrance slit, motorized entrance mirror, CCD exit port, triple grating turret
SR-500i-D1	Spectrograph, manual double entrance slit, motorized entrance and exit mirror, single CCD exit port, single exit slit, triple grating turret
SR-500i-D2	Spectrograph, manual double entrance slit, motorized entrance and exit mirror, dual CCD exit port, single exit slit, triple grating turret

NOTE: This does not include a detector flange, which must be ordered separately, details of which are shown on page 4. The other accessories available for use are shown below.

Additional standard accessories:

SR-ASM-0002	1.5" Flange Fibre Adaptor
SR-ASM-0013	Camera Lens Adaptor
SR-ASM-0014	Pen-ray Lamp Mount
SR-ASM-8001	Fixed Fibre Adaptor
SR-ASM-8003	Fixed SMA Fibre Adaptor
SR-ASM-8006	X-adjustable Fibre Adaptor
SR-ASM-8010	XY-adjustable Fibre Adaptor
SR-ASM-8011	Fixed FC Fibre Adaptor
SR-ASM-8012	Y-adjustable (fast kinetics) Fibre Adaptor Single and multi (2-5 way-input) fibres.
SR-OPT-8002/8027	Available in various material and core diameter options. SR-500i and SR-750 shutter.
SR-SHT-9002	NOTE: When using an Andor PCI camera, an additional I/O box (Andor Part # IO160) is required for the shutter to function
SR-ASM-0039	SR-500i mirror-based f/# matcher for NA = 0.22 fibre optic, ferrule connection
SR-ASM-0041	SMA adapter for SR-500i mirror-based f/# matcher

Specifications subject to change without notice

- ◆1 Additional gratings available on request.
- ◆2 Reciprocal linear dispersion (nm/mm) defined @ 435.8nm
- ◆3 Bandpass defined for 1024 pixel CCD array with 26µm pixels. Quoted values are nominal @ 435.8nm
- ◆4 Maximum grating efficiency is measured by the grating manufacturer
- ◆5 The grating efficiency data is typical and should only be used for relative comparison to other gratings. Data supplied by grating manufacturer

Need more information? Please contact us at:

International Office

Phone +44 28 9023 7126

Fax +44 28 9031 0792

US Office

Phone 800.296.1579

Fax 860.290.9566

Japanese Office

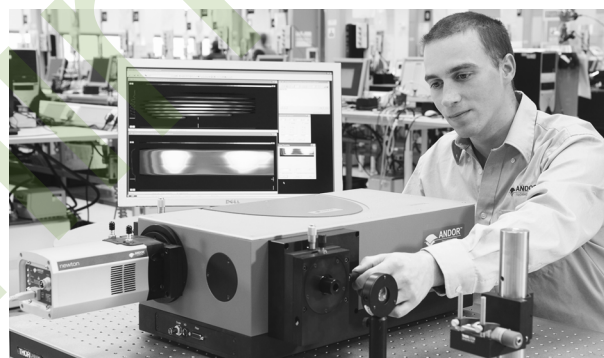
Phone +81 3 3511 0659

Fax +81 3 3511 0662

Chinese Office

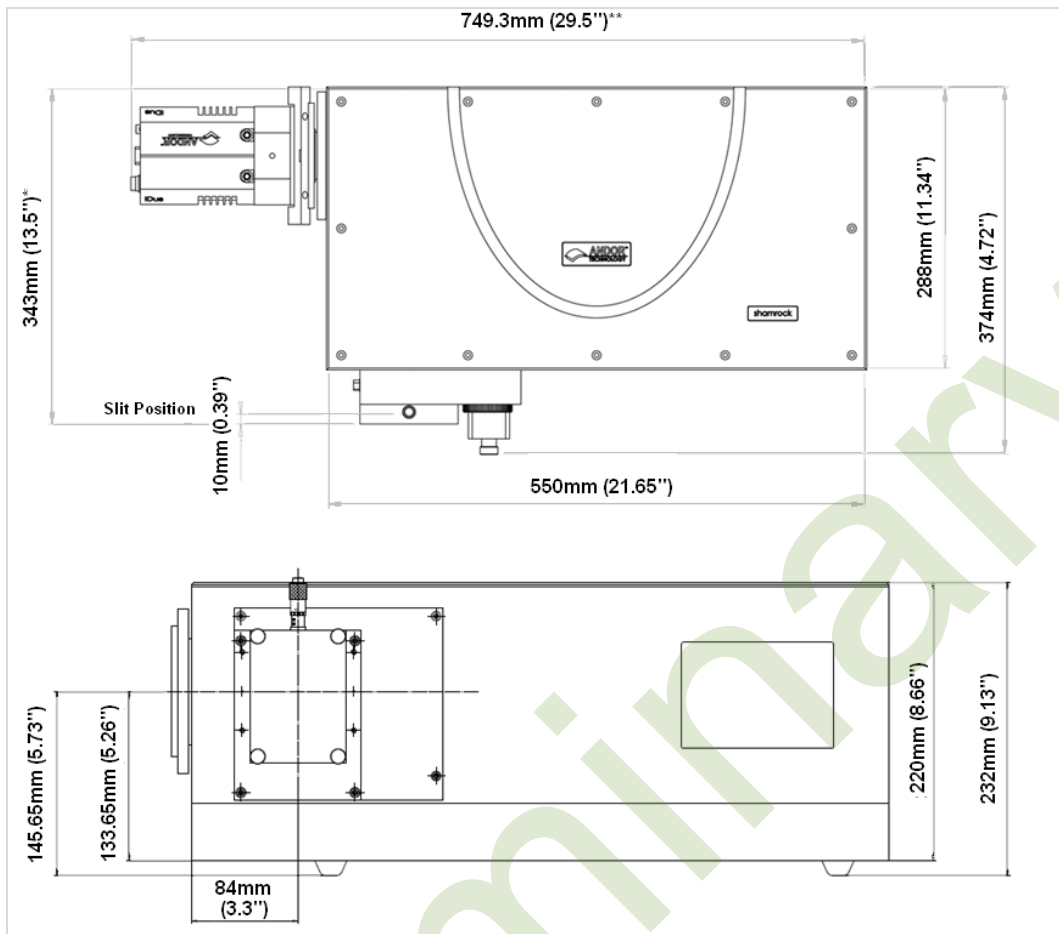
Phone +86-10-5129-4977

Fax +86-10-6445-5401



SR-500i undergoing alignment testing

Dimensions in mm [inches] & weights



Optical Axis

137 mm [5.39"] with pad feet

* The optical path height with standard pad feet attached as shown.

** The overall length is shown with an Andor iDus camera attached.

NOTE: The length with an Andor Newton camera is 750.9mm [29.56"] and with an Andor iStar is 802.6mm [31.6"]

Weight

25 kg [55 lb] (approx.)

Imaging property of SR-500i at the imaging plane

