Kymera 193i
Intelligent, Modular and Compact Spectrograph for Physical and Life Science

Key Specifications
✓ 193 mm focal length
✓ F/3.6 aperture
✓ Adaptive Focus (Patented)
✓ Dual detector outputs
✓ Dual grating turret & eXpressID™
✓ Compact footprint
✓ Plug-and-Play USB interface

Key Applications
✓ Raman
✓ Luminescence/PL
✓ Absorption/Transmission
✓ SFG/SHG
✓ Material Science
✓ Chemistry & Catalysis
✓ Life Science/Biomedical

andor.oxinst.com
1 Dual Exit Ports

Versatile and flexible configurations for wide range of spectroscopy measurements.
Dual port setups include combinations of:
- CCD cameras for UV, Vis and NIR spectroscopy
- ICCD cameras for UV to NIR and Time Resolved measurements
- Single Point Detectors (SPDs) for scanning spectroscopy solutions from UV to SWIR
- SPDs for time resolved, lifetime measurements
- Exit slits for monochromator tunable light source
- Fiber coupling to deliver output light/signal to another part of experiment

The ports are easily selected through the software and integrity of calibration for each port is independent and well maintained.

2 Adaptive Focusing (patented*)

Automated optimization for the best quality of focus:
- Ensures the best resolution at any wavelength
- Automatic optimization when changing between gratings, or cameras
- Software-controlled, easy to switch on and off when required
- No need for tedious adjustment of camera position at the exit ports

*Adaptive Focus Technology, patent WO2016012794 A3

3 µ-Manager Control

User-friendly simultaneous access to Andor Kymera 193i, low-light spectroscopy cameras and a wide range of microscopes and microscope accessories. Andor’s dedicated interface allows seamless spectral acquisition, display and manipulation, as well as facilitating ‘spectral’ mapping sequences with advanced metadata handling.

5 simple steps to set up your microspectroscopy experiment
1. Set up spectrograph
2. Set up camera
3. Set up microscope
4. Set up experiment e.g. X-Y-Z chemical mapping
5. Display spectral data in real time & save acquisition series
**Features and Benefits**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>193 mm focal length, F/3.6 aperture</td>
<td>Ideal combination for a wide range of applications, ranging from luminescence/photoluminescence spectroscopy, to more demanding, higher resolution Raman spectroscopy.</td>
</tr>
<tr>
<td>Adaptive Focus (patented)</td>
<td>Intelligent and user-friendly interface, for uncompromised spectral resolution performance.</td>
</tr>
<tr>
<td>Dual-grating turret with xPressID™ RFID technology</td>
<td>Seamless field-upgradability with precise indexing interface, and user-friendly hatch access. Automatic gratings recognition and setup, with embedded RFID tags - minimum user interaction.</td>
</tr>
<tr>
<td>Astigmatism-corrected optical design</td>
<td>Toroidal optics enable multi-track fiber detection and excellent sample image relay from a microscope at the grating ‘O’ order.</td>
</tr>
<tr>
<td>Dual outputs</td>
<td>Extended wavelength coverage when combining Andor UV-NIR CCD, EMCCD, ICCD and InGaAs cameras. Slit option for monochromator operation.</td>
</tr>
<tr>
<td>USB interface</td>
<td>Plug-and-play connectivity, ideal for laptop operation alongside Andor USB cameras.</td>
</tr>
<tr>
<td>Seamless connection to microscopes</td>
<td>Adjustable height feet and choice of direct, lens relay, or cage system-based interfaces. 15 mm wide-aperture input slit for extended sample image relay and spectral analysis through the same optical path.</td>
</tr>
<tr>
<td>Protected silver-coated optics option</td>
<td>Most efficient for NIR/SWIR detection when used in conjunction with Andor InGaAs cameras.</td>
</tr>
<tr>
<td>Pre-aligned, pre-calibrated instrument</td>
<td>Individually characterized spectrograph-detector systems for out-of-the-box operation.</td>
</tr>
<tr>
<td>High repetition rate shutter</td>
<td>10 Hz continuous operation and 40 Hz burst mode for ultrafast background acquisition and detector protection.</td>
</tr>
<tr>
<td>µ-Manager software integration</td>
<td>Simultaneous control of Andor cameras and spectrographs, and a wide range of microscopes and accessories through 1 single software platform. Dedicated, user-friendly spectrum handling interface.</td>
</tr>
<tr>
<td>Integrated in EPICS®</td>
<td>Integration and operation at EPICS-based large research facilities.</td>
</tr>
<tr>
<td>Compact and rugged design</td>
<td>Ideal for integration into OEM instruments, or space constrained setups.</td>
</tr>
</tbody>
</table>

**The Kymera 193i in key numbers**

| Resolution with Newton DU940 CCD                            | 0.21 nm  
| 1200 l/mm @ 500 nm                                           | 0.10 nm |
| 2400 l/mm @ 300 nm                                           |                                                   |
| Aperture                                                     | F/3.6                                                                                                         |
| Focal length                                                 | 193 mm                                                                                                         |
| Magnification (Vertical @ centre of CCD)                     | 1.07                                                                                                           |
| Gratings                                                     | Interchangeable dual on-axis RFID-tagged turret for easy swapping                                             |
| Communication                                                | USB 2.0                                                                                                         |
| Wavelength accuracy centre                                   | 0.15 nm                                                                                                         |
| Wavelength repeatability                                    | 75 pm                                                                                                          |
Step-by-Step System Configuration

How to customize the Kymera 193i:

1. **Chassis configuration**
   a) Select combination of input and output ports (see page 5 for available options).
   b) Select type of optics coating required (aluminium + MgF$_2$ is standard, protected silver coated optics available on request, for NIR detection).
   c) Select purge port option (for improved detection down to 180 nm). Shutter for background acquisition and protection of the detector.

2. **Resolution & band-pass**
   Select gratings and detector to fulfil resolution and wavelength requirements.

3. **Input light coupling interface**
   Refer to accessory tree for available configurations (direct coupling, fibre coupling or 3rd party hardware connectivity).

4. **2nd exit port configuration**
   Refer to accessory tree for available configurations, including camera flanges.

5. **Software interface**
   Select either state-of-the-art Solis software or Software Development Kit (SDK) option – please refer to the appropriate section for further information.
Step 1 - Chassis Configuration

Ordering Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Side input port</th>
<th>Direct output port</th>
<th>Side output port</th>
<th>Motorized port selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>KYMERA-193i-A</td>
<td>Manual slit</td>
<td>Camera</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>KYMERA-193i-B1</td>
<td>Manual slit</td>
<td>Camera</td>
<td>Manual slit</td>
<td>✓</td>
</tr>
<tr>
<td>KYMERA-193i-B2</td>
<td>Manual slit</td>
<td>Camera</td>
<td>Camera</td>
<td>✓</td>
</tr>
<tr>
<td>KYMERA-193i-xx-SIL</td>
<td>Protected silver-coated optics options for models shown above (replace x with relevant model number)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Optics Coatings Reflectivity Graph

Standard systems use Al + MgF₂ coated optics. Protected silver optics are also available on request for maximum efficiency in the NIR region - recommended for working with Andor iDus InGaAs detectors or IR single-point detectors, such as MCT, PbS and InSb.

When choosing protected silver coatings, it is strongly recommended to also order protected silver coated gratings for maximum efficiency throughout the system.

Chassis Accessories

- Additional Grating Turret* (SR2-ASM-8083)
- USB Cable (standard)
- iStar CCD and sCMOS iC to BNC ACC-ELC-05323
- Shutters** (SR-SHT-9006 or SR-SHT-9006-FIELD for field upgrade only)
- Purge Connector (SR-ASM-8040)
- Adjustable feet (standard, set of 4 feet)
- 6 mm spacer kit (set of 4 fixed spacers, SR-ASM-0098)

*For field upgrade only

**For field upgrade only
Step 2a - Choosing The Right Platform vs Dispersion Requirements

Czerny-Turner spectrographs are designed to provide the best optical performance for a range of grating angles as reflected on the green parts of the graph above. Outside this range, the spectral lines may exhibit a degree of optical aberration (such as comal), which will become more prominent at the steeper angles. These configurations are reflected by the orange to red scales on the graph. In these regions, consideration should be given to higher spectrograph focal length models with lower groove density gratings to achieve the desired resolution.

<table>
<thead>
<tr>
<th>Grating (l/mm)</th>
<th>150</th>
<th>300</th>
<th>600</th>
<th>1200</th>
<th>1800 (Holo)</th>
<th>2400 (Holo)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shamrock 163</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandpass (nm)$^{3,4}$</td>
<td>1072</td>
<td>529</td>
<td>256</td>
<td>117</td>
<td>68</td>
<td>56$^c$</td>
</tr>
<tr>
<td>Resolution (nm)$^{4,5}$</td>
<td>2.33</td>
<td>1.15</td>
<td>0.56</td>
<td>0.25</td>
<td>0.15</td>
<td>0.13$^c$</td>
</tr>
</tbody>
</table>

| **Kymera 193i** | | | | | | |
| Bandpass (nm)$^{3,4}$ | 902 | 445 | 215 | 98 | 56 | 46$^c$ |
| Resolution (nm)$^{4,5}$ | 1.96 | 0.96 | 0.47 | 0.21 | 0.12 | 0.10$^c$ |

| **Kymera 328i** | | | | | | |
| Bandpass (nm)$^{3,4}$ | 542 | 268 | 131 | 61 | 41 | 29$^c$ |
| Resolution (nm)$^{4,5}$ | 0.88→0.62 | 0.44→0.31 | 0.21→0.15 | 0.10→0.07 | 0.06→0.04 | 0.05→0.04$^c$ |

Where aberration is a concern for a particular experimental set-up, the table above shows resolution and band-pass performance for a variety of alternative configurations. This should be used in conjunction with the graph above to assist in selecting the most appropriate spectrograph platform to meet resolution and band-pass needs, whilst minimising the risk of potential aberration.

Have you found what you are looking for?

**Need higher spectral resolution?** The Shamrock spectrograph family also offers half and three-quarter meter focal length motorized platform.

**Need extended multi-track capabilities?** The Holospec offers unique high-density multi-fibre acquisition with ultra-low crosstalk.

**Need higher collection efficiency?** The Holospec offers a unique F/1.8 aperture and high transmission optics for maximum throughput.
Step 2b - Choosing The Right Grating vs Resolution and Band-pass

The Kymera 193i features a dual grating turret, designed to offer flexibility and control over your choice and interchange of gratings. The dual grating turret can be easily and speedily removed, and replaced by an alternative turret with new gratings. The intelligent design of the 193i means that only a simple offset adjustment is required once the new turret and gratings are added. The 193i 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 two pre-installed gratings (see below for details). If the grating you require is not on the list, please contact Andor for further details. Additional grating turrets (part number SR2-ASM-8083) can also be supplied on request.

<table>
<thead>
<tr>
<th>Lines/mm</th>
<th>Blaze (nm)</th>
<th>Nominal dispersion (nm/mm)</th>
<th>Bandpass (nm)</th>
<th>Resolution (nm)</th>
<th>Peak efficiency (%)</th>
<th>Andor part number</th>
<th>Maximum recommended wavelength [nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>300</td>
<td>32.80</td>
<td>907</td>
<td>1.97</td>
<td>72</td>
<td>SR2-GRT-0150-0300</td>
<td>6820</td>
</tr>
<tr>
<td>150</td>
<td>500</td>
<td>32.63</td>
<td>902</td>
<td>1.96</td>
<td>73</td>
<td>SR2-GRT-0150-0500</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>800</td>
<td>32.35</td>
<td>894</td>
<td>1.94</td>
<td>80</td>
<td>SR2-GRT-0150-0800</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>1250</td>
<td>31.90</td>
<td>882</td>
<td>1.91</td>
<td>84</td>
<td>SR2-GRT-0150-1250</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>300</td>
<td>16.27</td>
<td>450</td>
<td>0.98</td>
<td>88</td>
<td>SR2-GRT-0300-0300</td>
<td>3410</td>
</tr>
<tr>
<td>300</td>
<td>500</td>
<td>16.08</td>
<td>445</td>
<td>0.96</td>
<td>81</td>
<td>SR2-GRT-0300-0500</td>
<td></td>
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<tr>
<td>300</td>
<td>1000</td>
<td>15.53</td>
<td>429</td>
<td>0.93</td>
<td>72</td>
<td>SR2-GRT-0300-1000</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>1200</td>
<td>15.29</td>
<td>423</td>
<td>0.92</td>
<td>92</td>
<td>SR2-GRT-0300-1200</td>
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<tr>
<td>300</td>
<td>1700</td>
<td>14.59</td>
<td>403</td>
<td>0.88</td>
<td>89</td>
<td>SR2-GRT-0300-1700</td>
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<tr>
<td>600</td>
<td>300</td>
<td>7.99</td>
<td>221</td>
<td>0.48</td>
<td>84</td>
<td>SR2-GRT-0600-0300</td>
<td>1705</td>
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<tr>
<td>600</td>
<td>500</td>
<td>7.77</td>
<td>215</td>
<td>0.47</td>
<td>72</td>
<td>SR2-GRT-0600-0500</td>
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<tr>
<td>600</td>
<td>1000</td>
<td>7.06</td>
<td>195</td>
<td>0.42</td>
<td>72</td>
<td>SR2-GRT-0600-1000</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>1200</td>
<td>6.72</td>
<td>186</td>
<td>0.40</td>
<td>88</td>
<td>SR2-GRT-0600-1200</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>1900</td>
<td>5.17</td>
<td>143</td>
<td>0.31</td>
<td>88</td>
<td>SR2-GRT-0600-1900</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>(1600)</td>
<td>5.91</td>
<td>163</td>
<td>0.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>830</td>
<td>820</td>
<td>4.98</td>
<td>138</td>
<td>0.30</td>
<td>87</td>
<td>SR2-GRT-0830-0820</td>
<td>1230</td>
</tr>
<tr>
<td>830</td>
<td>1200</td>
<td>4.17</td>
<td>115</td>
<td>0.25</td>
<td>83</td>
<td>SR2-GRT-0830-1200</td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>300</td>
<td>3.82</td>
<td>106</td>
<td>0.23</td>
<td>72</td>
<td>SR2-GRT-1200-0300</td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>500</td>
<td>3.53</td>
<td>98</td>
<td>0.21</td>
<td>81</td>
<td>SR2-GRT-1200-0500</td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>1000</td>
<td>2.45</td>
<td>68</td>
<td>0.15</td>
<td>69</td>
<td>SR2-GRT-1200-1000</td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>(800)</td>
<td>2.95</td>
<td>82</td>
<td>0.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>Holographic</td>
<td>3.53</td>
<td>98</td>
<td>0.21</td>
<td>81</td>
<td>SR2-GRT-1200-EH*</td>
<td></td>
</tr>
<tr>
<td>1800</td>
<td>Holographic</td>
<td>2.48</td>
<td>69</td>
<td>0.15</td>
<td>70</td>
<td>SR2-GRT-1800-DH</td>
<td>570</td>
</tr>
<tr>
<td>1800</td>
<td>Holographic</td>
<td>2.28</td>
<td>63</td>
<td>0.14</td>
<td>62</td>
<td>SR2-GRT-1800-FH</td>
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</tr>
<tr>
<td>2400</td>
<td>300</td>
<td>1.68</td>
<td>46</td>
<td>0.10</td>
<td>68</td>
<td>SR2-GRT-2400-0300</td>
<td>425</td>
</tr>
<tr>
<td>2400</td>
<td>Holographic</td>
<td>1.81</td>
<td>50</td>
<td>0.11</td>
<td>68</td>
<td>SR2-GRT-2400-BH</td>
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</tr>
<tr>
<td>2400</td>
<td>Holographic</td>
<td>1.48</td>
<td>41</td>
<td>0.09</td>
<td>73</td>
<td>SR2-GRT-2400-GH</td>
<td></td>
</tr>
<tr>
<td>Mirror</td>
<td>UV-VIS</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>SR2-GRT-MR-AL-MGF2</td>
<td></td>
</tr>
<tr>
<td>Mirror</td>
<td>VIS-NIR</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>SR2-GRT-MR-SILVER</td>
<td></td>
</tr>
</tbody>
</table>

*Option for minimized scattered light.
Step 2c - Selecting The Correct Grating Efficiency Option

All graphs shown below represent efficiency for 45° polarisation

Important Consideration

System throughput is dependent on the grating’s angle of operation and may decrease with higher grating operating angles.

Need to have maximum collection efficiency in the NIR/SWIR? All gratings are also available with protected silver coating. Please contact your local representative for further information.
Step 3 - Selecting The Correct Light Coupling Interfaces

How to customize the Kymera 193i (Side Entrance Port):

- Spacer (Standard)
- Filter Wheel Assembly (ACC-SR-ASZ-7005)
- Motorized Slit Assembly (SR-ASZ-0035) inc 6 x 4 mm (W x H) Cover Plate
- Wide Aperture Slit (SR-ASZ-0086) inc Ø27 mm Cover Plate
- Manual Slit Assembly (Standard) inc 6 x 4 mm (W x H) Cover Plate
- Neutral Density Filters
- Long Pass Filters
- Short Pass Filters
- Raman Edge Filters
- Side input port (applicable to all models)

- Fixed FC Fibre Adapter (SR-ASM-8011)
- Fixed SMA Fibre Adapter (ACC-SR-ASM-8003)
- SMA Fibre (50 µm ACC-ME-OPT-8004) (100 µm SR-OPT-8039)
- Sample Chamber (ACC-SR-ASZ-0056)

- Fixed Fibre Adapter, Ferrule Input (SR-ASM-8001)
- X-Adjustable Fibre Adapter (See page 10 Section C X-Y fibre couplers with slit assembly)
- X-Adjustable Fibre Adapter, Ferrule Input (SR-ASM-8006)
- Fibre Ferrule (SR-OPT-80XX)

- Optical Cage System Adapter (SR-ASM-0065)
- Cage System (Please refer to Thorlabs or Linos catalogue)

- F-Mount Camera Lens Adapter (SR-ASM-0013)
- 1.5" Flange Adapter for Newport Oriel Accessories (SR-ASM-0002)

- C-Mount Adapter (SR-ASM-0021)

- Pen-Ray Lamp Mount (SR-ASM-0014)
- Pen-Ray Lamp Hg-Ar, Hg-Ne, Ar, Kr, Ne

- C-Mount Lens (OL-XXXX-X000)
- SR-ASZ-0079 Optical Relay

- X-Y Adjustable Fibre Adapter (See page 11 Section B Direct X-Y fibre couplers)

- C-Mount Lens Flange (TR-XXXX-CAGE-ADP)

- X-Y Adjustable Fibre Adapter, Ferrule Input (SR-ASM-8006)
- Fixed Fibre Adapter, Ferrule Input (SR-ASM-8001)
- X-Adjustable Fibre Adapter, Ferrule Input (SR-ASM-8006)
- Fibre Ferrule (SR-OPT-80XX)

- Cage system microscope flange (TR-XXXX-CAGE-ADP)
- F-Mount Lens
- C-Mount Adapter (SR-ASM-0021)
- Pen-Ray Lamp Mount (SR-ASM-0014)
- Pen-Ray Lamp Hg-Ar, Hg-Ne, Ar, Kr, Ne

- C-Mount Lens (OL-XXXX-X000)
- SR-ASZ-0079 Optical Relay

- X-Y Adjustable Fibre Adapter (See page 11 Section B Direct X-Y fibre couplers)

- C-Mount Lens Flange (TR-XXXX-CAGE-ADP)
How to customize the Kymera 193i:

**Step 4 - Cameras and Output Port Flanges**

**Direct Detector Output Port**

- iKon-M Mounting Flange (MFL-SR-IKON-M)
- iXon ULTRA Mounting Flange (MFL-SR-IXON)
- iStar Mounting Flange (MFL-SR-ISTAR-DIRECT)
- ZL41 Wave Mounting Flange (MFL-SR-ZYLA)
- Marana Mounting Flange (MFL-KY-MARANA)

- Note: Ø 32 mm aperture cover slit recommended to avoid vignetting for larger sensor of the Marana.

**Side Output Port (Applicable to B models)**

- Note: This output is compatible with Andor Spectroscopy CCD and ICCD cameras - no mounting flange required.

**C-Mount Adapter** (SR-ASM-0021)

**Sample Chamber** (ACC-SR-ASZ-0056)

**X-Y Adjustable Fibre Adapter** (See page 11 Section B: Direct X-Y fibre couplers)

**Output Port**

- Motorized Slit Assembly*13 (SR-ASZ-0036)

- Cover Plate for Motorized Slit Assembly (See page 11 Section A: Slit Covers)

**Multi-channel Detector Flange** (MFL-SR-CCD) (To be ordered separately)

**Cover Plate for Motorized Slit Assembly**

- Output Port

**C-Mount Adapter** (SR-ASM-0021)

**Sample Chamber** (ACC-SR-ASZ-0056)

**X-Y Adjustable Fibre Adapter** (See page 11 Section B: Direct X-Y fibre couplers)

**Cover Plate for Manual Adjustable Slit Assembly** (See page 11 Section A: Slit Covers)

- Manual Adjustable Slit Assembly*13 (Standard) inc 6 x 4 mm (W x H)

- Cover Plate

**Output Port**

- Motorized Slit Assembly*13 (SR-ASZ-0036)

- Cover Plate for Motorized Slit Assembly (See page 11 Section A: Slit Covers)

**X-Y Adjustable Fibre Adapter** (See page 11 Section B: Direct X-Y fibre couplers)

**C-Mount Adapter** (SR-ASM-0021)

**Sample Chamber** (ACC-SR-ASZ-0056)

**X-Y Adjustable Fibre Adapter** (See page 11 Section B: Direct X-Y fibre couplers)

**Cover Plate for Manual Adjustable Slit Assembly** (See page 11 Section A: Slit Covers)

- Manual Adjustable Slit Assembly*13 (Standard) inc 6 x 4 mm (W x H)

- Cover Plate

**Output Port**

- Motorized Slit Assembly*13 (SR-ASZ-0036)

- Cover Plate for Motorized Slit Assembly (See page 11 Section A: Slit Covers)

**X-Y Adjustable Fibre Adapter** (See page 11 Section B: Direct X-Y fibre couplers)

**Note:** a flange MUST be ordered separately for any configuration involving a multichannel or InGaAs detector.
Step 4A: Slit Covers

<table>
<thead>
<tr>
<th>Size</th>
<th>Motorised Slit</th>
<th>Manual Slit</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 x 4 mm (W x H)</td>
<td>SR-ASM-0016$^{14}$</td>
<td>SR-ASM-0025</td>
</tr>
<tr>
<td>6 x 6 mm (W x H)</td>
<td>SR-ASM-0017</td>
<td>SR-ASM-0026</td>
</tr>
<tr>
<td>6 x 8 mm (W x H)</td>
<td>SR-ASM-0010</td>
<td>SR-ASM-0027</td>
</tr>
<tr>
<td>6 x 14 mm (W x H)</td>
<td>SR-ASM-0011</td>
<td>SR-ASM-0029$^{14}$</td>
</tr>
<tr>
<td>Ø 27 mm</td>
<td>SR-ASM-0072$^{15}$</td>
<td>SR-ASM-0100$^{15}$</td>
</tr>
<tr>
<td>(Ø 32 mm aperture)</td>
<td>SR-ASM-0107</td>
<td>SR-ASM-0106</td>
</tr>
</tbody>
</table>

Notes:
- For connection to manual slits, please also order Ø27 mm slit cover plate SR-ASM-0100
- For connection to motorized slits, please also order Ø27 mm slit cover plate SR-ASM-0072
- For connection to manual slits, please also order Ø32 mm slit cover plate SR-ASM-0106 (Marana sCMOS)
- For connection to motorized slits, please also order Ø32 mm slit cover plate SR-ASM-0107 (Marana sCMOS)

Step 4B - X-Y Fibre Coupler (with NO slit)

Step 4C - X-Y Fibre Coupler (with slit assembly)

Notes:
- For connection to manual slits, please also order Ø27 mm slit cover plate SR-ASM-0100
- For connection to motorized slits, please also order Ø27 mm slit cover plate SR-ASM-0072
- For connection to manual slits, please also order Ø32 mm slit cover plate SR-ASM-0106 (Marana sCMOS)
- For connection to motorized slits, please also order Ø32 mm slit cover plate SR-ASM-0107 (Marana sCMOS)
Step 5 - Selecting a Software Option

The Kymera 193i requires at least one of the following software options:

1 - **Solis Spectroscopy** A 32-bit and fully 64-bit enabled application for Windows (8, 8.1 and 10) offering rich functionality for data acquisition and processing, as well as Andor cameras, spectrograph and motorized accessories simultaneous control. AndorBasic provides macro language control of data acquisition, processing, display and export.

2 - **Standalone Solis** Spectroscopy GUI for standalone spectrograph operation

3 - **Kymera and Shamrock SDK** A software development kit that allows you to control the Andor range of Kymera and Shamrock spectrographs from your own application. Compatible as 32-bit and 64-bit libraries for Windows (8, 8.1 and 10). Compatible with C/C++, C#, VB.NET and LabVIEW for Windows/Linux

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**Solis Spectroscopy:** Dedicated spectroscopy acquisition software

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**Wavelength drive**

Set the wavelength of interest by dragging slider or typing the desired value. For step-and-glue, select wavelength range for extended bandpass and high resolution acquisition.

**Exposure time**

Set the exposure time for the detector - quick access for easy acquisition optimization.

**Real Time Control**

(a and f) Slit drive: Control the spectrograph slit width - drag blades on icon or type in required slit width

(b) Flipper motor: Used to select the appropriate exit port

(c) Shutter: Synchronization mode selection for shutter operation

(d) Filter wheel: Used to select a particular filter on the filter wheel - just click on the desired filter position

(e) Grating turret: Used for setting grating turret to a new position and bringing desired grating in the optical path - just click on the desired grating

(g) Adaptive focus: Used for automatic focus or user-controlled fine focus optimization
Optical Axis
Standard feet: Nominal optical axis height: 130 - 136 mm, increments of 6 mm with stackable spacer kit (SR-ASM-0098).

Standard configuration shown with manual slit on input, CCD flange on straight output.

Weight: 7.5 kg [16.5 lbs approx]

Connecting to the Kymera 193i

USB Control
Connector type: USB ‘B’ type

Shutter Control
Connector type: BNC Female, 50 Ω

Shutter Specifications
Maximum repetition rate: 40 Hz - burst; 10 Hz - sustained
Minimum open/close time: 6 ms
Minimum lifetime: 1 Million cycles

Optical Property
Focal plane size (mm, W x H): 30 x 16
Grating size (mm): 50 x 50
Stray light:
- 1 nm from laser: $3.8 \times 10^{-4}$
- 10 nm from laser: $4.7 \times 10^{-5}$
- 20 nm from laser: $8.9 \times 10^{-6}$
Magnification: 1.07:1

Wavelength Drive Performance
Wavelength accuracy centre: 0.15 nm
Wavelength repeatability: 75 pm

Wavelength Side Accuracy
Wavelength side accuracy: 0.2 nm
Our Cameras for Spectroscopy

Spectroscopy-based diagnostics in the fields of Material Science, Chemistry, Life Science or Fundamental Physics & Optics rely on the capture and analysis of optical and chemical signatures with a high degree of precision.

Andor’s range of detectors offer a wide range of sensitivity, time-resolution and sensor formats to best suit specific experimental conditions from UV to SWIR, nanosecond to hours time resolution, high photon flux to single photon with super dynamic range and resolution.

High Sensitivity & Dynamic Range

- Long exposure
- High sensitivity UV-SWIR
- Large pixel well depths
- High resolution matrix

iDus CCD & InGaAs | Newton CCD & EM

ns to µs Time-Resolution

- Nanosecond gating
- High sensitivity down to single photon
- On-head DDG with ps accuracy

iStar CCD & sCMOS

kHz Spectral Rates

- µs to ms time-resolution
- High sensitivity down to single photon
- High resolution matrix

Newton CCD & EMCCD | iXon EMCCD | ZL41 Wave sCMOS | Marana sCMOS

Extended Multi-fibre Spectroscopy

- Large area sensors
- Ultrafast sCMOS and EMCCD options
- High sensitivity down to single photon

iKon-M CCD | iXon EMCCD | ZL41 Wave sCMOS | Marana sCMOS | iStar CCD & sCMOS

Learn more about our detector range here.
Minimum Computer Requirements:
• 3.0 GHz single core or 2.4 GHz multi core processor
• 2 GB RAM
• 100 MB free hard disc to install software (at least 1 GB recommended for data spooling)
• USB 2.0 High Speed Host Controller capable of sustained rate of 40 MB/s
• Windows (8.1 and 10)

Operating and Storage Conditions
• Operating Temperature: 0°C to 30°C ambient
• Relative Humidity: < 70% (non-condensing)
• Storage Temperature: -25°C to 50°C

Power Requirements
• 100 - 240 VAC 50 - 60 Hz
• Max. power consumption: 21 W
• (10 Hz shutter and grating turret operation)

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