Full Frame Diffraction IMAGE STAR camera.

50 to 135mm LARGE AREA TAPERED X-RAY CCD DETECTOR

☞ Virtual Shutter Driver suppressing frame shift smear for continuous fast phi-slicing.
☞ Very high antiblooming capacity (>100x) allows acquisition at 16 bit dynamic range without saturation artefacts.
☞ Equivalent read out noise is less than 1 X-ray quantum at 8 - 50 keV.
☞ Full data processing software: integrated with the CCD detector: all acquisition and correction routines which handles image files to a remote PC dedicated to data visualisation.
☞ Full support Documentation including drawings, list of spares, hardware, software and API.
☞ Includes Factory acceptance procedures and test reports.
☞ On site installation services.
☞ Quality Assurance documents for the completed device with copies of all quality control checks and intermediate test results.
☞ Service and warranty for a period of 12 months from delivery.

DIFFRACTION DATA SHEET

**Photonic Science very low noise X-ray Diffraction Camera system:**

- Black kapton exclusion membrane in front of scintillator layer
- Scintillator: **Customed made GdOS:Tb** designed for maximum X-ray detection efficiency **in the range of 0.1-50 keV**
- On chip binning for increased sensitivity- user selectable: from 1 x 1 to 8 x 8
- Effective useful resolution 3056 (h) x 3056 (v) pixels
- Virtual shutter with smearing suppression, - user selectable exposure from ≈ 1ms to 15 minutes
- Mains input voltage   Via control unit nominally 110/ 220 V ac auto-sensing

Performance:

- 16-bit image digitisation.
  - Read noise: less than 1 X-ray quantum
  - Dark count rate: 0.05 events/pixel/second
  - Typical sensitivity 1,5 to 3 ADU/incident X-ray with gain set at 2.06electron/ADU
- Up to 0.5 full frame per second with standard fast 8 MHz driver with 16 bit digital output and 1x1 binning
- Input pixel size: 20.83µ x 20.83µ @ 1 x 1 binning, with image distortion correction and remapping algorithm (includes pixel sampling interpolation)
- Resolution with 90mm input size: 57 µ FWHM
- Larger input size available up to 135mm with 31.24 µ pixel size and 78 µ resolution FWHM
- Air forced cooling

Included Items:

- X-ray camera head with a mounting plate / foot to permit attachment to a (end-user supplied) mounting plate / arm.
- Power supply unit, user manual(s), standard software drivers
- Interconnecting cables: power supply unit to Camera head: 2m (standard), camera to PSL supplied USB2.0:   10**m (included with order)**
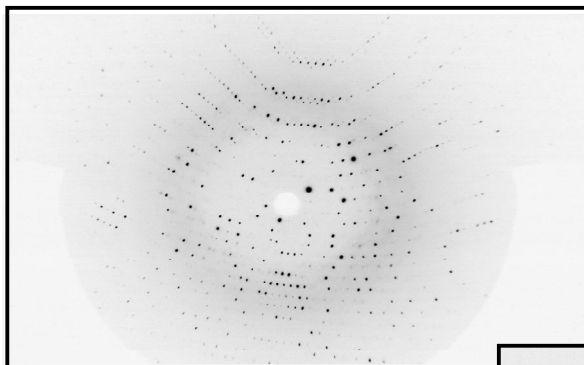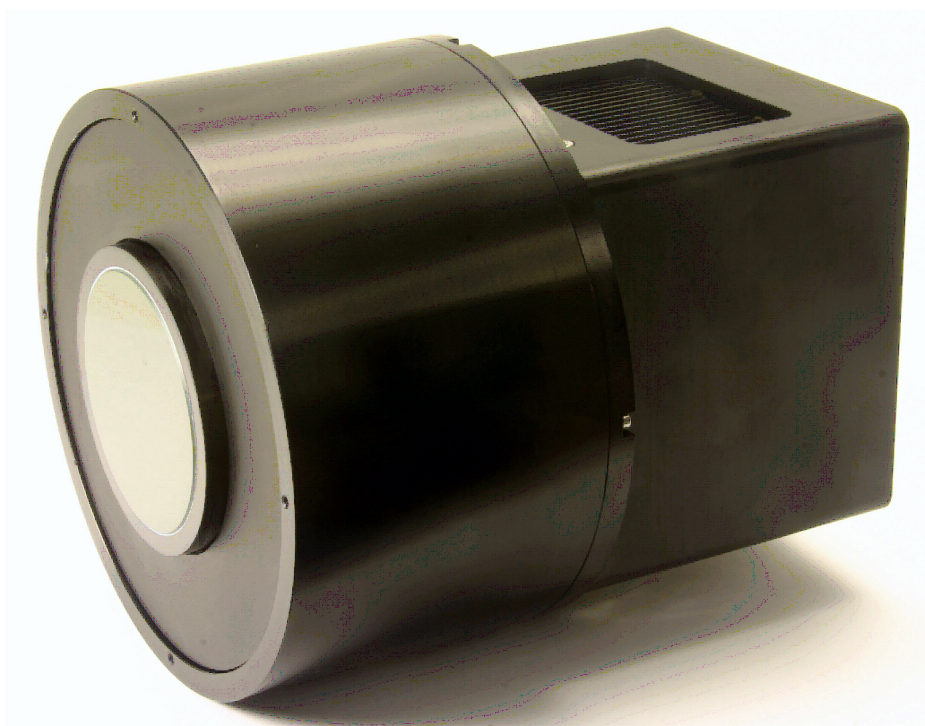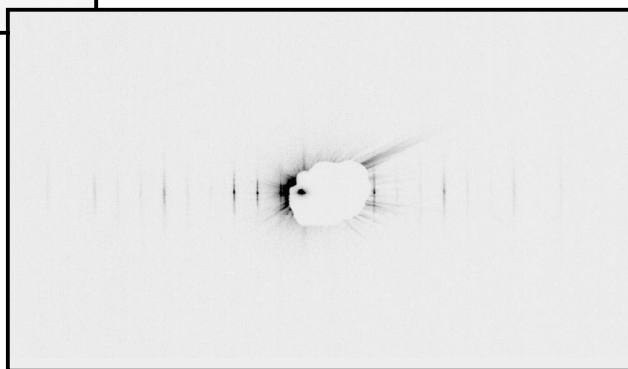
Small molecule and protein
crystallography:
Lyzozyme crystal,, 0.5 degree phi
Slicing, 4 minutes exposure on RAG
Cu source with 0.2 x2mm focusing
Cup with converging multilayer
Optics, 40 kV, 40 mA

Courtesy EMBL, Heidelberg

Diffraction on Collagen Sample
Microfocus beamline ID13
Energy 14 keV, 2 minutes exposure

Courtesy ESRF, Grenoble

DIFFRACTION DATA SHEET

Acquisition software:

- Drivers, including 16 acquisition modes, (32 bit Windows O/S including 98/ NT/ 2000 and XP)
- PSLink library with DLL and sample C++ code for camera Link driver to assist end-user driver development – Application Programmable Interface support
- Automatic offset correction (gives flat pedestal)
- Automatic dark correction (for long integration)
- Automatic flat field correction (homogeneity response)
- Sequential acquisition with software selectable variables: number of images, time between images, image display during sequence or direct storage to disk, acquisition on RAM
- Sequential tool including frame averaging, frame extraction, frame difference
- Frame accumulation in 16 bit frame buffer for extended dynamic range without binning
- External Hardware trigger mode
  - rising or falling edge, with pre defined exposure in software
- Software trigger mode
  - Predefined in software with sync pulse output when read out cycle is accomplished
- Auto exposure option with saturation warning
- Spatial and intensity calibration (angular measurements, position, distances between diffraction spots)

DIFFRACTION DATA SHEET