

USBeamPro

Model 2323 USB 2.0 Camera

ISO Standard Beam Parameters

- ◆ D_{slit} , D_{energy} , $D_{4\sigma}$
- ◆ Centroid and Peak location
- ◆ Major and Minor axes
- ◆ Ellipticity, Eccentricity
- ◆ Beam Rotation
- ◆ Gaussian Fit
- ◆ Flat-top analysis/Uniformity
- ◆ Divergence
- ◆ Pointing stability
- ◆ M^2 (K-factor)



The USBeamPro is a camera-based beam profiling system with USB 2.0 connectivity, operating under Photon's renowned BeamProfiler Software in Windows™. It provides highly accurate measurements of ISO Standard beam profile parameters, including beam diameter, centroid, and power/energy. The USB 2.0 interface offers enhanced ease of use and portability.

The USBeamPro features a 2/3" format CMOS 1280×1024 array with 6.7µm square pixels; for a total beam imaging area of 8.6mm×6.9mm. The camera's small form factor of 54×54×33mm allows ease of placement into typical optical paths.

The nominal dynamic range of this array is 30dB (10-bit digitization). Profiles with greater than 48dB (>16-bit effective digitization) can be acquired with Extended Range Imaging. High dynamic range is important in many applications, especially lens characterization, where lens aberrations are apparent from faint features around a strong central peak in the beam profile.

This instrument provides a high level of portability for beam profiling, since a peripheral frame grabber card is not required for this system. Thus, this equipment can be easily transferred to different laptop or desktop computers without the additional step of installing a frame grabber card and the required software drivers into the computer.

USBeamPro Acquisition and Analysis Software

The USBeamPro Software is written specifically for MS Windows XP Professional or MS Windows 2000 Professional and takes full advantage of the menu driven, multi-windowing environment. The software performs rigorous data analysis in accordance with the ISO standards, providing quantitative measurement of numerous beam spatial characteristics. Pass/Fail limit analysis for each of these parameters can be also applied.

For data display and visualization, the user can arrange and size multiple windows as required. These may contain, for example, live video, calculated beam parameters and summary statistics in the form of graphs, tables, 3D views and strip chart time displays. These user instrument views can be saved as files for future use.

Data can be exported to spreadsheets, math and statistical analysis programs and process/instrumentation control programs by logging to files or COM ports, or by sharing using ActiveX Automation.

Software Window Views for Data Display and Visualization

- ◆ Video
- ◆ Dual Aperture Profiles
- ◆ Beam Statistics
- ◆ 3D Profile View
- ◆ 2D Topographic View
- ◆ Time Statistics Charts (up to 15)
- ◆ Pointing/Targeting
- ◆ M^2 Interactive
- ◆ Notes

Features

- ◆ Measures CW or Pulsed sources
- ◆ USB 2.0 Connectivity
- ◆ 10-bit digitization – 30dB Dynamic Range
- ◆ Extended Range Profiles at >16 Bits (48dB)
- ◆ External and Software Trigger
- ◆ Up to 27 frames/second (Full frame @ full resolution)
- ◆ Photon BeamProfiler Acquisition and Analysis Software
 - Stand Alone GUI
 - ActiveX Automation Interface
- ◆ Exposure Control: 30 μ s – 30ms
- ◆ Small form factor (54.2mm x 54.2mm x 32.6mm)
- ◆ Cover glass removed to eliminate fringes
- ◆ High Beam Profiling Accuracy Beam Diameter
 - ~3% for $\geq 65\mu\text{m}^*$
 - Centroid: 0.1 μm standard deviation

*Specified accuracy is for 30ms exposure and proper beam attenuation, such as with the Photon ATP-SM.. Accuracy is reduced when using exposure control depending on beam diameter.

PC Specifications:

- ◆ 1.8GHz or faster Pentium IV Processor
- ◆ Windows XP Professional SP1 or Windows 2000 Professional SP2 Operating System
- ◆ USB 2.0
- ◆ 512 MB of RAM
- ◆ CD-ROM Drive
- ◆ 30MB free space on hard disk
- ◆ SVGA Display Monitor
- ◆ 64MB Color SVGA Graphics Card
- ◆ Mouse or other Pointing Device
- ◆ Keyboard
- ◆ **Recommended:** PC with Intel USB chip set

Model 2323 Camera Specifications

- ◆ Sensor: 1.3 MegaPixel CMOS 2/3" Format
- ◆ Image Plane: 14.2mm from rear surface
- ◆ Effective Pixel Elements: 1280 (H) × 1024 (V)
- ◆ Pixel Size: 6.7µm × 6.7µm
- ◆ Array Dimension: 8.6mm × 6.9mm
- ◆ Scanning Mode: Progressive
- ◆ A / D Conversion: 10 Bit
- ◆ Maximum Frame Rate 27 fps (full frame @ full resolution)
- ◆ Wavelength:
 - Standard: 380-1100nm
 - Optional: 190-1100nm
- ◆ Exposure range: 30µs to 30ms
- ◆ Trigger: Internal or External (Software selectable)
- ◆ External Trigger Specifications: TTL (Positive transition)
- ◆ Trigger Connector: Hirose 6 pin
- ◆ Trigger Cable: Hirose 6 pin to BNC
- ◆ Interface: USB 2.0
- ◆ USB Connector: USB mini-B 5 pin
- ◆ USB Cable: USB mini-B 5 pin to USB A
- ◆ Supply Voltage: 4.40 to 5.25 V supplied by USB 2.0 interface
- ◆ Supply Power: <1.6 W
- ◆ Dimensions, W × L × H: 54.2mm × 54.2mm × 32.6mm
- ◆ Filter/Lens Mount: C-mount (1"-32)
- ◆ Camera Rotation Mount: 32mm I.D.; ¼"-20 hole on Optical Axis Optional M6 Adapter
- ◆ Operating temp: 0° to 50°C

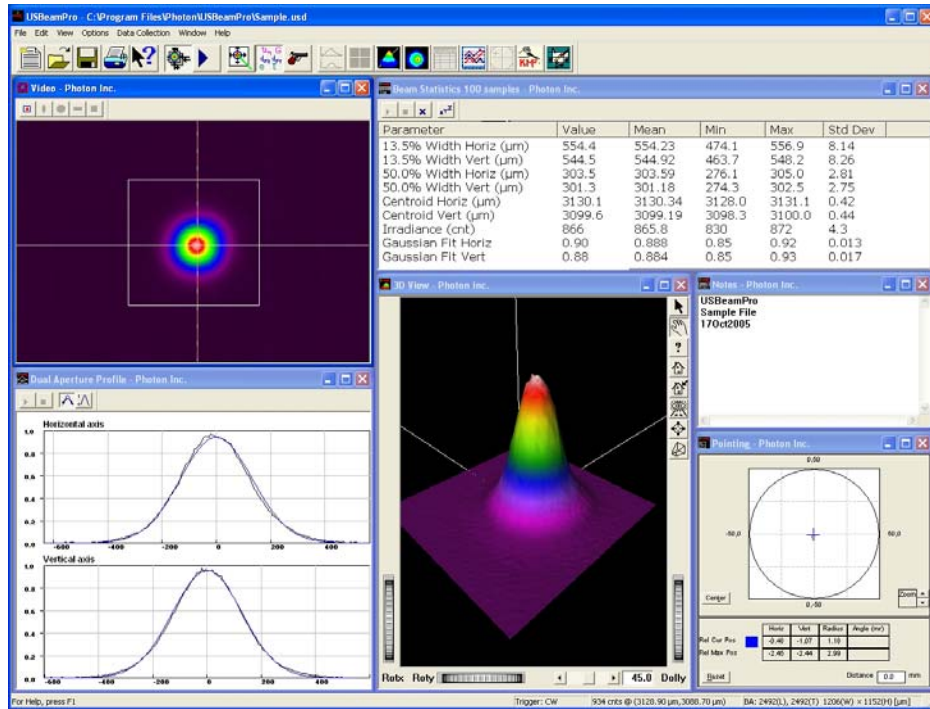


Figure 1. A beam profile acquired and displayed by the Photon USBeamPro.

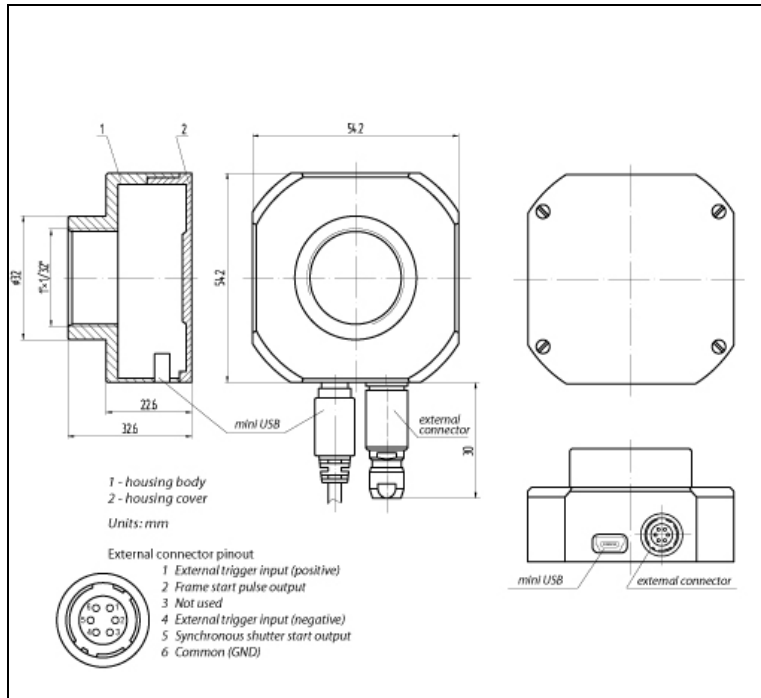


Figure 2. Mechanical Dimensions of USBeamPro

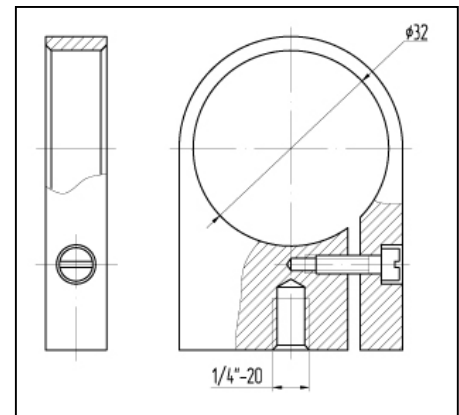


Figure 3. Rotation mount for USBeamPro Camera