



**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY**  
**MATERIALS MANAGEMENT DIVISION**  
**Powai, Mumbai 400076**

**For PR No.1000016235 (RFx No.6100000449)**

**Technical Specifications for Gel Documentation and Imaging System**

1. A versatile Western Blot Imaging system to support wide range of applications like chemiluminescent, colorimetric, and fluorescent blots, and nucleic acid and protein detection via colorimetric and fluorescent stains.
2. The Instrument should carry Independent LED's as Light Source with the following illumination sources and Filters
  - Trans-UV -302nm, Epi White, Trans White, Epi-Blue (460-490 nm), Epi- Green (520-545 nm), Epi-Red (625-650 nm), Epi Far Red (650-675 nm), Epi Near IR (755-777 nm). The Instrument should necessarily carry UV Trans-illumination to explore primary excitation maxima(s) of fluorescent dyes
  - 590/110 nm Standard Filter, Chemiluminescence Filter, 518-546 nm Filter, 577-613 nm Filter, 675-725 nm Filter, 700-730 nm Filter, 813-860 nm Filter.
3. A large imaging area of 20 cm (width) x 16 cm (height) or more.
4. System should have Mechanical Zoom to maintain optical resolution over any field of view without compromising sensitivity.
5. A high resolution monochromatic thermoelectric cooled CCD with reduced background (low read and dark noise) to provide film-like sensitivity and resolution. The CCD Camera should carry the following specifications:
  - Motorized (mechanical) Zoom Lens with Dynamic Zoom (No requirement for adjusting the sample position for increasing or decreasing the FOV)
  - 2,750 H x 2,200 V pixels (or higher), 6 megapixels or better
  - $\geq 70\%$  quantum efficiency (QE) at 425 nm
  - F value  $\leq 0.95$ .
  - 16-bit data acquisition.
  - Pixel size should be 4.54 x 4.54  $\mu\text{m}$  or better
  - Low dark current,  $\leq 0.002$  e<sup>-</sup>/p/s at  $-15^\circ\text{C}$
  - Peltier cooling to  $-15^\circ\text{C}$ , absolute
  - $>4$  orders of linear dynamic range for all samples
  - Signal accumulation mode (SAM) for easy optimization of exposure time for Chemiluminescence detection
  - Various Binning Options like 2x2, 3x3, 4x4 and 8x8 for customized sensitivity.
6. The Imaging System/Software should allow Stain-free technology & add new functionality to western blotting by enabling researcher's quality control (QC) validation of their results at each stage of the process, thereby increasing confidence in results.
7. The Imaging System/Software should allow total protein normalization with stain-free technology as an alternative to normalization with single housekeeping proteins (HKPs). Alternatively, the system should

also allow normalization with single housekeeping proteins (HKPs).

8. A 12" or bigger touch-screen display with multitouch capability to enable users to easily interact with the touch screen to acquire, assess, and export images. Internal Onboard memory minimum 100 GB.
9. Safety interlocks designed to avoid unintentional ultraviolet (UV) exposure. A protective UV shield for use during band excision to be made available as an accessory.
10. The image analysis software should allow Automated lane and band identification, molecular weight or base pairs evaluation, band sizing, and quantitation based on a reference band or quantity standards.
11. Allow Publishing resolution (dpi) and publishing dimension to be specified with a one-click image export for publication. Provides functionality to produce image at user-defined dpi and dimension.
12. Software should be able to export images on a 16-bit and 8-bit tiff images with a one-click export option.
13. Software should be able to export images in multiple formats with minimum options of exporting in .tiff, .png, .jpg and .bmp.
14. Factory calibrated flat fielding for ensuring uniform data for all applications. System should be calibrated for image area, focus, and flat field correction at the factory and files stored in the integrated PC.
15. No requirement of license for registration. Software should be available for both PC and Mac
16. Software should produce customizable reports with data organized as desired, including, Lane and band identification, molecular weight or base pair evaluation.
17. Instrument should have multiple input/output ports with minimum 3 USB ports allowing users to connect USB devices (like keyboard, mouse, data storage, and printer). Also, system should have Ethernet port so that users can transfer image files via Ethernet to networked computers.
18. Standard Computer (Intel 10<sup>th</sup> Gen Core i5 Processor, 1TB HDD, 16GB RAM DDR4X, Windows 10 Pro, 18 inch Monitor, Keyboard, Mouse) and 1kVA online UPS with 30mins back up should be supplied along with the system.

Additional Laptop for Data Handling - Processor: Intel 10<sup>th</sup> Gen Core i7-1065G7 4 x 1.3 - 3.9 GHz, Graphics adapter: Intel Iris Plus Graphics G7 (Ice Lake 64 EU); Memory: 16 GB, DDR4X-3733; Display: 13.5 inch 3:2, 2256 x 1504 pixel 201 PPI, Capacitive, native pen support, glossy: yes; Storage: 512 GB NVMe SSD; Connections: 1 USB 3.0 / 3.1 Gen1, 1 DisplayPort, 1 Docking Station Port, Audio Connections: 3.5 mm, Brightness Sensor, USB-C; Networking: 802.11 a/b/g/n/ac/ax (a/b/g/n = Wi-Fi, Battery: Lithium-Ion, Battery runtime: more than 8 hours; Operating System: Microsoft Windows 10 Pro 64 Bit; Webcam: HD 720p; Weight: ≤1.35 kg

#### 19. Accessories to be supplied with the system

- A) Rapid Semi Dry Blotting unit – Capable of transferring 4 mini gels or 2 midi gels in a single run. System should have integrated power supply, user defined programming options and also preprogrammed methods. System should be compatible with transfer packs as well routine western blotting consumables available in the lab
- B) DNA Gel Electrophoresis unit (Midi Size, 1 quantity) - Complete system should be supplied with 15 x 10 cm UV Transparent tray, buffer tank, lid with power cables, combs (1.5 mm 15 well and 30 well), compatible gel caster.
- C) DNA Gel Electrophoresis units (Mini Size, 2 quantity) - Complete system should be supplied with 7x10 cm UV Transparent tray, buffer tank, lid with power cables, (1.5 mm 8 well and 15 well combs), compatible gel caster.
- D) Vertical Gel Electrophoresis Unit (1 quantity) – Capable of running 4 mini gels at a time. Complete system should be supplied with 10 well 1 mm combs (5 nos), 15 well 1 mm combs (5 nos), Spacer plates with integrated spacers (5 nos), Short Plates (5 nos), casting stand (2 nos), casting frames (4 nos) and any other accessory required to run 4 gels at a time.
- E) Power Supply - Should be compatible with both DNA gel and Protein Gel Units; Output: 500V, 2.5 A, 500W, with option for Constant current, constant voltage or constant power; Volt Hour Control:

99000 V-hr; Pause-resume function, real time clock, and Automatic recovery after power failure with method storage feature; Should be able to run 4 units in parallel; Power Pac Should meet EN-61010, CE requirements and have safety features like No load detection, sudden load change detection, ground leak detection, over load /short circuit detection, over voltage protection

20. Imaging system and its parts including light sources, filters and camera, Computers, Power pac, Semi Dry Blotting unit, Gel Electrophoresis units should be supplied with **2 Years Warranty**.

**Total price including all accessories should be quoted in INR.**