



Reference No. (PR No. 1000021235)

RFX No. 6100000857

TECHNICAL SPECIFICATIONS

LED/LD Characterization Work station with Emission Profile Plotter

System Include:

200-1100nm 0.1nm resolution scanning spectrometer, 350-950nm CCD spectrometer, Profile plotter, Fiber optic cables, Current Voltage measurement unit, 100mm integrating sphere, -5 to 90 Degree TEC Hybrid Control unit etc.

The System can be used to measure the intensity of the light spectrum in the range of 200-1100nm using a scanning spectrometer and at variable emission angles.

Measurement parameters include

1. 3D emission plot
2. LED/LD spectral change vs different temperature
3. Light decay measurement
4. Colour temperature measurement
5. Colour temperature pattern
6. V-I, P-I Characteristics
7. Response characteristics

1. UV-VIS-IR Scanning Spectrometer

- 1.1. Optical path configuration: Czerny-Turner type
- 1.2. Dispersion element: Holographic grating
- 1.3. Grating density: 1200 grooves / mm
- 1.4. Relative diffraction efficiency: 45 - 65% (Visible)
- 1.5. Scanning Wavelength Range: 200 - 1100nm
- 1.6. Wavelength range (Detector): 200 - 1100nm
- 1.7. Resolution: 0.1 nm
- 1.8. Wavelength Repeatability: ± 0.5 nm
- 1.9. Slit width: 0 - 3 mm (Micrometer Controlled)
- 1.10. Detector: Hamamatsu 5.8x5.8mm Si photodiode



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2. USB CCD Spectrometer

- 2.1. Type: CG 216 CCD Spectrometer
- 2.2. Spectrograph f#: 2.9
- 2.3. Optical Platform: Concave Grating
- 2.4. Effective Spectral Range: 380 to 1020nm
- 2.5. Spectral Resolution: 1nm
- 2.6. Light Guiding Input Fiber NA: 0.22
- 2.7. Stray Light: <0.06% @ 532nm (<0.1% overall)
- 2.8. Detector: High sensitive (>150 V/lx.s) and low dark current CCD linear image sensor with >3600 pixels and electronic shutter function (ICG).
- 2.9. Pixel Number: 3648
- 2.10. Pixel Size: 8x200 μ m
- 2.11. Pixel Well Depth: 100,000 electron
- 2.12. Signal-to-noise Ratio: 1,000:1(at full scale)
- 2.13. A/D Resolution: 16 Bit
- 2.14. Integration Time: 0.1 to 6,500 ms
- 2.15. Frame Rate: up to 138 fps
- 2.16. PC interface: USB 2.0
- 2.17. Software: Spectra Analyte
- 2.18. Functions: Designed to manage all the spectroscopic functions

3. Profile Plotter Scanning Stage specification

- 3.1. Angular Resolution: 0.05 degrees
- 3.2. Angular Accuracy: ± 0.1 degrees
- 3.3. Range of Motion: ± 90 degrees
- 3.4. Rotation Stage: 360 degree continuously rotatable
- 3.5. Drive: Stepper Motor Controlled
- 3.6. Sample positioning: XY controlled
- 3.7. Computer Control: USB, RS-232
- 3.8. Standard Windows-based user interface

4. SMA 905 0.22NA Fused Silica Fiber optic patchcords

- 4.1. Core Diameter: 600 Micron
- 4.2. Wavelength Range: 190 - 1600nm
- 4.3. Connector: SMA 905
- 4.4. Numerical Aperture NA: 0.22
- 4.5. Numerical Aperture (NA) Tolerance ± 0.02
- 4.6. Index of Refraction n_d - Core: 1.458
- 4.7. Index of Refraction n_d - Cladding: 1.441
- 4.8. Acceptance Angle: 25.4 $^\circ$
- 4.9. Length: 1.5m



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5. Integrating sphere

- 5.1. Diameter: 100mm
- 5.2. One hemisphere with 2 holes of 25 mm diameter at 45 degrees angle and the other hemisphere with 3mm hole at the bottom (90 degrees)
- 5.3. Coating: Barium sulphate coated
- 5.4. Construction: Aluminium

6. Sample Holder TEC Heating/Cooling Hybrid Control Unit

- 6.1. Unit equipped with Thermo electric cooler and Heating coil arrangement.
- 6.2. Can hold 5-25mm samples.
- 6.3. Sample Heating Range: -5 Degree to 90 Degree
- 6.4. Setting resolution: 0.5°C
- 6.5. Thermo sensor: Pt 100 Ohms
- 6.6. Controls – USB PC Controlled

7. HO-PSM-T01L Probe Station System

7.1. Microscope unit

- 7.1.1. Optical system: Infinity corrected (200mm tube lens)
- 7.1.2. Observation Method: bright field
- 7.1.3. Illumination: Reflected (Co-axial and Angled)
- 7.1.4. Illumination system High bright white LEDs
- 7.1.5. Nosepiece: Revolving, quadruple with positive precision click stops
- 7.1.6. Viewing head: Siedentopf Trinocular head, 30-degree inclination, 48-75mm IP adjustment
- 7.1.7. Eyepiece: Wide field eyepiece
- 7.1.8. Magnification: 10X, FN: 20mm
- 7.1.9. Tube diameter-30mm, diopter adjustable
- 7.1.10. Focusing: roller guide (rack & pinion)
- 7.1.11. Objective: Plan Apo 5X
- 7.1.12. Type: long working distance Plan apochromatic objective
- 7.1.13. NA: 0.14, Working distance: 34mm, Focal length: 40mm
- 7.1.14. FOV with Eyepiece: 4 mm
- 7.1.15. FOV with camera: 1.14 x 0.856 mm, 1.426 diagonal

7.2. Camera

- 7.2.1. Optical format: 1/2.5" CMOS
- 7.2.2. Active imager size: 5.70mm x 4.28mm, 7.13mm diagonal
- 7.2.3. Active pixels: 2592 x 1944 (5Mp)
- 7.2.4. Pixel size: 2.2 x 2.2 um
- 7.2.5. Color filter array: RGB Bayer pattern
- 7.2.6. Shutter type: Global reset release (GRR), Snapshot only, Electronic rolling shutter (ERS)



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- 7.2.7. Maximum data rate / master clock: 96 Mp/s at 96 MHz (2.8 V I/O),
- 7.2.8. Frame rate: Full resolution – Programmable upto 15 fps,
- 7.2.9. VGA (640 x 480 with binning) – programmable upto 70 fps
- 7.2.10. ADC resolution: 12- bit, on-chip
- 7.2.11. Pixel dynamic range: 70.1 dB
- 7.2.12. Operating temperature: -30°C to +70°C
- 7.2.13. Power consumption: 381mW at 15 fps full resolution

8. **Warranty:** Minimum 1 year from the date of installation.