INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076

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Detailed Technical Specifications for Multimode Microplate Reader:

1. Instrument should be capable to read Fluorescence, Time-Resolved Fluorescence, Luminescence and UV-Visible Absorbance.
2. Same instrument should be upgradeable at site to include TR-FRET, Fluorescence Polarization detection mode by adding filter optics.
3. The monochromator optics and the filter optics should each have their own independent light source, detector and light path to prevent compromised performance.
4. Same instrument should be upgradeable at site to include Dual reagent dispenser which should be compatible to dispense in all 6, 12, 24, 48, 96 and 384 well plates. Should also support dispensing in all detection modes. Dispense volume range should be from 5 to 1000 µl in 1µl increments.
5. Must have quadruple grating optical design (two gratings per monochromator) for better spectral scanning performance.
6. End Point, Kinetic, Spectral scanning and Well area scanning read methodsshould be available
7. It should be compatible with 6, 12, 24, 48, 96 and 384 well microplates.
8. It should be supplied with 2 µL low volume microplate accessory with 16 sample microspots for direct nucleic acid quantification as well as fluorescence and luminescence measurements.
9. It should be able to perform automatic Z adjustment to accommodate varies plate heights and liquid levels, without requirement of any additional adapter.
10. Must be able to control temperature from ambient + 4 °C to 70 °C. It should have excellent uniformity across the microplate. Not have more than ±0.5 °C variation across the plate at 37 °C.
11. Must have temperature gradient setting to minimize condensation on plate lids during incubation processes.
12. Must be supplied with gas control option for CO2/ O2 for environmental control. Range: 0 - 20% (CO2); 1 - 19% (O2)
13. It should have both Linear, Orbital and double Orbital shaking modes with programmable speed and duration.

14. **Absorbance**

    a. Light Source: Xenon Flash Lamp with long life
    b. Wavelength selection through tuneable grating monochromator
    c. Wavelength range should be from 230 – 999 nm with minimum 1 nm increment
    d. OD measurement range should be from 0.0 to 4.0 OD
    e. OD measurement resolution should be 0.0001 OD
    f. Must have automatic individual well-by-well absorbance path length correction to automatically calculate 1cm path length corrected results and compensate for pipetting errors.
    g. Reading speed for 96 well plate should be not more than 15 seconds and 384 well plate should be not more than 30 seconds.

15. Fluorescence Intensity

a. Light Source: Xenon Flash Lamp with long life
b. Must have both Top and Bottom Fluorescence detection
c. Wavelength selection should be through double grating monochromator for both Top and Bottom reading.
d. Monochromator-based fluorescence must have available variable bandwidth monochromators with bandwidth selectivity between 9 nm and 50 nm in 1 nm increments.
e. Sensitivity for Top reading: Fluorescein 0.3fmol/well 384-well plate or better
f. Sensitivity for Bottom reading: Fluorescein 0.5fmol/well 384-well plate or better
g. Wavelength range should be from 250 to 700 nm or better
h. Dynamic range should be 7 decades for fluorescence intensity measurements
i. Detection system: PMT (Photomultiplier tube)
j. Reading speed for 96 well plate should be not more than 15 sec and 384 well plate should be not more than 35 sec.

16. Time Resolved Fluorescence

a. Light Source: Xenon Flash Lamp
b. Wavelength range should be from 250 to 700 nm or better
c. Sensitivity should be Europium 1250 fM (125amol/well in 384-well plate) or better

17. Luminescence

a. Wavelength range: 300 to 700nm
b. Dynamic range should be greater than 6 decades
c. Detection system: PMT (Photomultiplier tube)
d. Sensitivity should be at least 20 amol ATP or better

18. **Software:** Single integrated windows based software for Reader control and data analysis with multiple user license should be supplied with the instrument. The software should be able to analyse the data and perform the calculations.
19. Software must have Quick Read function to enable read the plate without lengthy protocol definition.
20. It should have USB port to connect it to external computer
21. Suitable compatible computer of below configuration for instrument control and data analysis should be supplied with the instrument. Computer with i7 processor 10^{th} Generation, 16 GB RAM, 1 TB HDD, USB Ports, 21' Colour Monitor, Keyboard, Mouse, Windows 10 Pro (64-bit) operating system, MS Excel 2016 or later.
22. Instrument should be CE and TUV marked. RoHS Compliant.
23. Power supply: 100 to 240 Volts AC, 50-60 Hz
24. 5 KVA online UPS (01 number)
25. Graphpad Prism for Academic (Perpetual License) - 2 activations
26. Warranty-3years