Technical Specifications for ChemiDoc, RT-PCR, and Gradient thermal cycler

High-sensitive Multiplex ChemiDoc imager with stain-free imaging:

1. System with true16 bit CCD (not A/D) camera; pixel density of 65,536 gray levels.
2. Individual pixel size should be at least 4.54 x 4.54 µm or bigger.
3. Camera resolution should be more than 6 megapixels.
4. The instrument should provide excellent quantitative data from a single blot having very intense and weak signals in a single image; to facilitate the same instrument's dynamic range should be at least 4 orders of magnitude for all applications (please support with relevant technical data)
5. Instrument should provide highest level for sensitivity and hence must have minimal dark current with maximum limit of 0.002 e/p/s and low read noise of not more than 6e-.
6. The camera should have peltier based cooling.
7. Quantum efficiency at 425 nm should be 70% or more, this will ensure that the instrument is highly sensitive to very faint signals from chemiluminiscent blots.
8. Motorized zoom fast lens with f/0.95 or better should be provided.
9. Light sources/excitation should include – Trans-UV (302 nm), Epi White, trans-white (requires White sample tray), 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) and should have option for trans-blue light (for SYBR safe DNA application).
10. Instrument should have provision for protective UV shield for use during band excision with safety interlocks to avoid un-intentional UV exposure to the user.
11. Minimum imaging area for white light and chemiluminesence application should be 20.5 cm x 16.5 cm.
12. Should provide image acquisition with automatic zoom, focus, and iris adjustment without the need for users to focus or adjust aperture settings.
13. The instrument should have onboard attached touchscreen of 12" or bigger with multi-touch capability (2 points) enabling users to easily interact with the touchscreen to acquire, assess and export images. Touchscreen actions should include – tap, double tap, pan, scroll and pinch to zoom.

14. 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). One USB port should be provided on the front panel for easy export to USB. Also, system should have one Ethernet port so that users can transfer image files via Ethernet to networked computers.

15. 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.

16. Users should be able lock the system to prevent other users from interrupting a long acquisition or changing the settings

17. System should be compatible with stain free technology and should provide total protein normalization.

18. System should be supplied with a stain-free acrylamide solution kit to enable stain-free imaging of gels and blots.

19. The system should provide flexibility in selecting the pixel binning options, should be possible to select minimally 2x2, 4x4 and 8x8 binning

20. System should have smart tray technology features to recognize the application specific tray and adjusts imaging parameters, iris settings and software options accordingly.

21. System should come with 1 year warranty

22. Should be supplied with a compatible desktop of i3 processor, 4 GB RAM & 1TB HDD and 2 KA Online UPS with 10-15 mins back up

Real Time PCR Specifications

1. Real time PCR with block of 96 x 0.2 ml tubes or plate to run typical 0.2ml tubes, strips, and plates.

2. The base thermal cycler should be able to be used for standard PCR without switching on the optical module / LED to have an increased life time of the optical device.

3. System should have Dynamic true thermal gradient capacity with minimum 8 different gradient temperatures

4. Minimum six excitation and six emission channels each filter should correspond to one dye that ensures smooth differentiation of dyes having high degree of spectral overlap.

5. System should be capable of detecting of 5 or more different fluorescent reporters in the same tube and be capable of Detecting Cy5, FAM/Sybr Green, VIC/JOE, TAMRA/Cy3, Texas Red, Quasar705

6. System should be able to collect data for all filters for all wells regardless of place setup.

7. System should have at least Maximum Ramp rate: $5^{\circ}C$ per sec and Average Ramp Rate 3.3 $5^{\circ}C$ per sec with Peltier Cooling & Heating for uniform temp control

8. Should have a channel dedicated for FRET experiments

9. Excitation –Emission range: 450- 730nm or broader.

10. No internal reference dye should be required. True 5 Color Multiplexing with use of 5 different fluorophores without the need of addition of any internal reference dye,

11. System should have 6 filtered LED as excitation source with 6 filtered Photodiode detectors for detection.

12. System should have detection method as moving shuttle optics

13. System should have dynamic range of 10 orders of magnitude and sensitivity to detect 1 copy of target sequence

14. Open system capable of running various chemistries so that Different chemistries using TaqMan, Molecular Beacon, SYBR green etc. all can be performed.

15. Temperature range 0– 100 ^{O}C with accuracy of $\pm0.2^{\circ}C$ and uniformity of $\pm0.4^{\circ}C$ within 10 sec of arrival at $90^{\circ}C$.

16. Sensitivity- Detect minimum 1.5-fold differences in target quantities in single plex reactions.

17. Minimum sample vol: 1µl & Max Sample volume 50 µl

18. Max Should detect ≤ 10 fmol of fluorescein

19. Should have multiple scan modes with a FAST scan option for reading all wells in 3 seconds

20. System should be capable of interchanging module of 96 well, 384 well qPCR and with 48 duals, 96 well and 384 well gradient PCR block.

21. The system should be factory calibrated with no requirement of any further calibration

22. System's Software should have Melt curve analysis, Automatic allelic discrimination by end point fluorescence or threshold cycle and Gene expression analysis by relative quantity (ΔCt) or normalized expression ($\Delta\Delta$Ct).

23. Comparison of upto 5000 Ct values from different data files should be possible

24. The amplification traces should be viewed on the LCD screen in real time while a run is in progress with touch screen facility.
25. The system Software should be capable of data collection, perform data analysis like t-Test, one-way ANOVA in few mouse clicks. The system Software should be able to generate publication ready bar charts, volcano plots, box & whisker plot & annotate with p values
26. Software should have express load feature which allows entry of data after experiment.
27. System should provide the option of software which is RDML compliant
28. Software should be compatible with all computer operating systems including Microsoft windows, Mac and Linux.
29. Software should be capable to import and analyze data from any real time PCR platform.
30. Software should be upgraded free of cost whenever upgrades comes and not limited to number of users' license.
31. System should have at least 100 installations in India and provide at least 10 Performance user certificates attached for the same.
32. System should come up with 50 pcs of 96 well plates, 100 sealers, 200 reaction sybr Green dye (of same make of RT PCR)
33. System should be licensed for research applications, IEC & CE certified.
34. Desktop i3, 4GB RAM, 1 TB HDD and 2KVA online UPS with 10-15 mins back up should be provided.
35. Service center should be in Delhi-NCR for timely after sale service.
36. System should come with 1-year warranty

Gradient Thermal Cycler

1. Should have a sample capacity of 96 x 0.2ml tubes, 0.2ml tube strips or 1 x 96-well plate
2. Should have Peltier heating and cooling.
3. Should have gradient capability with minimum 8 gradient temperatures and identical hold times for all rows of the gradient
4. Should have minimum temperature differential range of 1-25°C.
5. Should have touch screen interface responsive for both gloved and ungloved fingers to display graphics for easy programming.

6. Should be capable of running reaction volumes up to 100ul.

7. Should be capable to attain a ramping rate up to 4°C per sec

8. Should have a temperature range of 4-100°C

9. Should have a gradient range of 30-100°C

10. Should have a minimum temperature uniformity of ± 0.5°C well to well within row and Temperature accuracy of ±0.5°C of programmed target

11. Should have a minimum memory of 500 programs with option for further expansion through a USB Flash drive for transfer of files.

12. The software should have exportable Run logs and system error logs

13. Should be compatible with all kind of plastic consumables and reagents

14. Should have UI boot up time less than 30 seconds

15. System should come with 1year warranty

16. **Vendor should quote all instruments from same manufacturer.**

17. **The specifications should be authenticated by brochures and company website/catalog. Technical catalogue or brochure of the model must be provided. Instant preparation of the same based on the specifications provided and its onward submission will disqualify the bidder without any further communication.**

18. **If the need be, the qualifying bidders may be required to place the demo model of the quoted equipment in the Department for testing the efficiency of the equipment. Based on the efficiency and the results obtained the technical committee may further disqualify the vendors and shortlist the vendors whose financial bid will then be opened.**