

Equipment description: *Inverted Optical Research Microscope for Bright Field, Dark Field, Phase contrast and Fluorescence applications with Dual mode camera as per the specifications listed below.*

A. Minimum technical specifications for one unit of Inverted Optical Research Microscope:

1	Microscope Stand	<p>Large, stable, bearing mounted Microscopy stand with provision to attach camera on Left Side port.</p> <p>Coded camera side port to the left-hand side with 0%/100% and 80%/20% (viewport/eyepieces) split with 16 mm or more field of view (FOV) for Camera.</p> <p>Objective nosepiece with 6 coded positions.</p>
2	Focusing	<p>Manual Z-axis focusing with body mounted course and fine knobs having a travel range preferably 11 mm or more</p>
3	Observation tube	<p>Binocular with 45 degrees viewing angle and minimum 25mm of field of view (FOV).</p>
4	Illumination	<p>Coded Transmitted Light column tilting mechanism continuously variable luminance adjustment of brightness, with field diaphragms.</p> <p>Inbuilt fast shutter of min 10ms operation time.</p> <p>Must be LED-based for longer life (approx. 30000 hours or more)</p>
5	Condenser	<p>Universal turret condenser with minimum 70mm WD and minimum</p> <p>Five positions turret to use Transmitted Light (TL)</p> <p>Contrasting methods Bright Field (BF), Dark Field (DF), Polarization (POL), and Differential Interference Contrast (DIC).</p>
6	Contrasting Method	<p>Microscope should be equipped for Bright Field, Phase Contrast & Fluorescence modes of operation.</p>
7	Mechanical stage & Holder	<p>Three point mounted regular fixed stage. Aluminium, ceramic -coated, scratch-proof and hard.</p> <p>Object guide for regular, heat able or cooling fixed stages, with deep-lying coaxial control drive,</p> <p>Must have an accurate and sensitive adjusting knob.</p> <p>Object guide Travel Range: 80 x 120 mm or more.</p> <p>Universal Holding Frame, suitable for fixed stages of inverted Microscopes with object guide.</p> <p>Holding frame for petri dishes with diameter 24 mm up to 68 mm and slides with a length up to 120 mm.</p>
8	Fluorescence attachment & Illumination	<p>Encoded Fluorescence Filter turret with 6 or more positions.</p> <p>Cool LED light source to cover intense, broad-spectrum for imaging most common fluorescent stains.</p> <p>Spectral coverage is from the UV (DAPI excitation) to the Red region (Cy5</p>

		excitation). Life time 30000 operating hours or more.
9	Fluorescence Filters	Fluorescence Filters: Pixel shift corrected fluorescence filters for (i) DAPI, (ii) FITC/GFP/Alexa488 and (iii) TRITC/RHOD/Cy3.
10	Objectives	Nose piece: minimum six positions coded to hold following objectives ; Numerical Aperture (NA); Phase contrast (PH); Free Working Distance (FWD) 1. 5 times magnification; NA = 0.12, phase contrast; FWD > 12 mm 2. 10 times magnification; NA = 0.25, phase contrast; FWD > 10 mm 3. 20 times magnification; NA = 0.35, phase contrast; FWD > 6.5 mm 4. 40 times magnification; NA = 0.55, phase contrast; FWD > 3.0 mm with correction collar 5. 60 times magnification or more; NA = 0.70, phase contrast; FWD > 2.5 mm with correction collar All objectives with better NA and FWD will be preferred. All objectives with better NA and working distance will be preferred.
11	Eyepieces	10x / 22 mm field of view or more with dioptr adjustment for both the eyes
12	Dual mode Camera	Dual mode monochrome and color CCD camera. Number of Pixels 1900 x 1400, or more Pixel size 5 µm x 5 µm or smaller A typical full well capacity of 15.000 electrons or more Various binning modes (color & monochrome), and overlapping mode for high-speed imaging should be available. Number of Frames per second (color) : 1 x 1 binning, minimum 1900 x 1400 pixels with 40 fps or more : 1 x 1 binning, minimum 1250 x 1000 pixels with 50 fps or more : 3 x 3 binning, minimum 600 x 450 with 90 fps or more. : 5 x 5 binning, minimum 350 x 250 with 100 fps or more. Dynamic range ~ 65 dB or higher Detector must have One stage regulated Peltier cooling 16-bit A/D converter together with 12 bit and 8 bit digitization mode. It must have provision for C-Mont adapter
13	Software	Software to control all the motorized components of Microscope and above camera for acquisition of images control. Should include modules for Time lapse & Multichannel, -Image Processing & Measurement: - Adjust contrast, brightness and gamma on every image - Merge, crop and image arithmetic - Intensity, length and area measurements - Measurement of area intensities through image stacks - Online measurement whilst displaying a live image - Parallax correction
14	Note	Microscope, objectives, Camera & SW all four must be from one manufacturer.
15	Future Upgradation	<ul style="list-style-type: none"> • 63x/1.30 OIL objective along with DIC attachment to be quoted • 100x/1.32 oil to be quoted

B. Other requirements

1.	On-site installations and testing at IIT Madras Lab, Chennai is required.
2.	Warranty should be 12 months from the acceptance of the equipment or 15 months from the delivery whichever is later.
3.	Manufacturer should be in a position to supply the accessories on demand for the next 10 years after installation of the equipment.
4.	Vendor must submit the point-wise technical compliance statement supported with the relevant technical manual along with the bid.
5.	The vendor must have installed at least five similar Inverted Fluorescence Research Microscopes in national laboratories or centrally funded institutes (like IITs, NITs, IISc, NISER, IISERs and central universities etc.) in India in last five years. Submit installation certificates along with technical specifications.