

**Technical Specifications for 3D scanner for Crime Scene Investigation,
Anti-Terrorism Pre-Planning, VVIP Security & Accident Reconstruction**

1. Scanner should be able to work independently without any supportive device like Tablet or laptop during scanning.
2. The hardware should have capacity to capture range from 150000-900000 points/sec with Scan area capacity of 150 meters in one scan. Software solution should be capable to process high resolution 3D point cloud.
3. The laser scanning device should not have range error as a systematic measurement error at around 10 meters and 25 meter more than ± 1 mm.
4. The scanner should produce a 360-degree image of atleast 150 plus megapixels at a resolution of 4 megapixel at given point of image.
5. Field of view for scene capture angle should be minimum 360 degree for horizontal and 300 degrees for vertical.
6. The software solutions provided with scanner should essentially have Blood Spatter Analysis, Bullet trajectory analysis, 2-dimensional Crime scene sketch/2D map layout and Accident Reconstructions
7. It shall essentially create a web share of the captured/Processed Data to be reviewed at any remote location on any normal configuration of Laptop/ Tablet.
8. The machine shall comply with ISO 9001 standards and should be portable to carry on crime scenes, less than 5 kg including Battery.
9. Vertical scan speed of the machine should not be less than 90 Hz.
10. Laser used to scan should be human safe and class I with wave length in 1200-1800nm preferably $1550 \pm$ nm.
11. Laser optical transmitter beam diversion should essentially be between 0.25 mrad to 0.35 mrad.
12. Internal power source should be able to run the operation for a minimum of 4-5 hours.
13. Capture instrument/camera should support operations from -20^0 to $+50^0$ Celsius in direct sun exposure.
14. Ingress protection should be at least IP54 and should be Splash proof for operations in moderate rains.
15. Software application shall essentially support Integrated Virtual reality mode for crime scene visualization
16. Data storage should support universal card formats like SD, SDHC, SDXC etc.

17. Capture instrument should support remote operation through WiFi for laptop and mobile device operations.
18. Capture instrument should have integrated GPS, Tilt Sensor, Barometer and GLONASS.
19. The device should have integrated electronic Compass and software should support and be able to decode the GPS locations.
20. Point cloud processing software should support all formats of cloud irrespective of hardware make and model.
21. Should have integrated/automatic and manual cloud registration.
22. It shall be possible to use the scanner in Invert / tilted mode.
23. Should have touch screen control and shall have a facility to connect the scanner to any Android/ IOS Phone for controlling the operations of Scanner for a distance of few meters.
24. Should have dual axis compensator for levelling each scan 0.015^0 with an accuracy of 19 arcsec valid within $\pm 2^0$
25. Should have height sensor via an electric barometer relative to a fixed point to detect and add to a scan.
26. One License of Forensic analysis software should be provided with following functions:-
 - a. Blood spatter analysis ----> This application helps to analyse the pattern of the blood at any surface indicating nature of arms used to fire and distance from which bullet might be fired
 - b. Bullet trajectory analysis ----> The bullet trajectory is crucial information for forensic examination which helps the investigators to identify the origin or the firing Point
 - c. Suspect height analysis----> Using blood spatter analysis and bullet trajectory, the origin of firing can be determined which helps to determine the possible height of the suspect who fired the bullet
 - d. Vehicle crash investigation and impact analysis----> The software application helps to reconstruct the Scene of Crime digitally which may also create a hypothetical analysis based on skid marks and vehicle speed using crash Data Reports
27. Should be non-condensing in humid conditions.
28. Processed PST files through software should be supported by all 3D Formatting tools.

29. Application should support registration of multiple captures/scans/images automatically
30. The scanner must have interface for future upgradation and can connect additional accessories to the scanner, so that a user can have an option of specific customizations
31. The transportation Box of the solution should be waterproof and ergonomic and should meet in cabin baggage dimensions for air travel.
32. Capture unit should be able to work in rough environments while providing protection from dust, debris and water splashes.
33. The Scanner shall be supplied with a Light weight Carbon Fibre Tripod capable of handling 18 Kg of payload weight and shall have 04 Leg sections.
34. The Tripod shall have angle selection and G-Lock ultra for quick operations
35. The tripod shall have Removable feet.
36. Service/Support of the equipment should be provided on PAN India basis.
37. Training: The bidder shall arrange to provide onsite training for Anti –Terrorism, VVIP Security Planning, Indoor and outdoor crime scene scanning and shall essentially conduct a workshop for the same.
38. OEM Should essentially have a local office in India.
39. The bidder shall be either an OEM or directly authorised by OEM to represent himself for the department.
40. Minimum 3 years warranty should be provided for the above item and the firm should provide AMC for a period of 3 years after the warranty period.