

**REQUEST FOR COMMENTS OF STAKEHOLDERS/OEM/FIRMS
ON QRS (QUALITY REQUIREMENT) & TDS (TRIAL DIRECTIVES)
OF 3D LASER SCANNING AND IMAGING SYSTEM.**

1. The proposed QRs/TDs of 3D Laser Scanning and Imaging System is attached as **Appendix 'A & B'**. The OEMs/Vendors are requested to forward information of the product which they can offer and also forward correct specifications of their system against each parameter. Complied or not complied remarks will not be accepted.

2. The required information/details may please be forwarded at the following addresses by 15.03.2019

Directorate General CRPF

East Block-7, Sec-1, R.K. Puram, New Delhi-110066

Email: comncell@crpf.gov.in

3. An early response is requested.

QRs OF 3D LASER SCANNING AND IMAGING SYSTEM

<u>S No</u>	<u>Specifications</u>
<u>System Functionality</u>	
1.	System must provide automatic 3D Scanning with 360 degree horizontal by 300 degree or better vertical field of view
2.	Ranging Accuracy 4mm or better at 10 mtr 7mm or better at 20 mtr With user selectable resolution settings
3.	System must capture objects at minimum range of 0.65 mtr to maximum range of 60 mtr or better from axis of scanner (Radial Range)
4.	System must use Waveform Digitization Technology for better results
5.	System must support at least IP54 rating for dust and water protection
6.	System must support upto 150 MP or better Panoramic image full dome capture, HDR, LED flash calibrated spherical image/IR based imaging
7.	System must provide real time viewing & navigation of image during scan process
8.	System must operate on portable battery with minimum 3 hrs of operation or better per battery
9.	Must have scan time of roughly 4-5 minutes per position including image capture
10.	System must support either onboard memory for more than 100 setups/ at least 2 TB memory storage/ universal card formats like SD, SDHC, SDXC
11.	System must provide data manipulation, visualisation and modelling capabilities such as creation of 2 D drawing and creation of CAD objects
12.	System must support data registration, computation, analysis and modelling under one single software environment and in one single database upto the web publication phase, animation and 3 D modelling phase
13.	System must allow publication of point cloud into web-based format for online collaboration, support hyperlink, measurement, mark up inside Web browser. System should be simple to use and install and should not require server installation.
14.	System must come with Centralised Storage for high speed point cloud rendering with administrative privileges which allow a user to grant access to a particular project.

S No	<u>Specifications</u>
15.	System must be portable and easy to deploy preferably not more than 5kg.
16.	Data Acquisition rate must be minimum 350000 points per second or better
17.	Digital camera must be integrated high resolution (150 MP or better)
18.	Capture instrument should support remote operation through WiFi for laptop and mobile device operations.
20.	The Scanner shall be supplied with a Light weight Carbon Fibre Tripod, capable of handling 18kG of Payload weight
21.	The offered equipment shall essentially support VR goggles consisting of a base station, controller link box, link box power adapter etc. After the base station is set up one shall be able to use VR goggles to visit the 3D scanned imagery inside out.
22.	By using VR goggles, one should be able to visit the scanned 3D imagery (Here one feels as if he is practically present in that building/structure).
23.	The transportation Box of the solution should be waterproof
<u>Software Specification</u>	
24.	Software system must be able to handle unlimited size of point cloud database
25.	Software system must be client server based to allow a single storage of and dissemination of point cloud data
26.	System must provide Sophisticated Crash & Post Event Reconstruction Tools
27.	System must provide 2D and 3D viewing capability in synchronized views
28.	System must provide minimum three registration methods and algorithms that can be used independently or in conjunction, namely 1) cloud-to-cloud matching 2) Known targets and 3) Automatic Visual Registration Tools.
29.	System must provide Audit Logs for Evidence Integrity.
30.	System must be compatible with Major Point Cloud handling and Publishing Softwares and should be able to conduct two way communications.
31.	System must provide the ability to register and superimpose internal images automatically and external images (3D Cubic Map and single camera image) on scanned data for photo-realistic presentation
32.	Provide various scene investigation tools like Bullet Trajectory, Animation for construction, Point Cloud overlay on images for measurement and analysis, View point analysis, Wizard for creating finished diagrams, Sketching mode
33.	Should support extraction of 2D drawings from 3D models and scanned data

S No	<u>Specifications</u>
34.	Should support direct import of .FLS, .3DD, ASCII point data (XYZ,SVY, PTS, PTX, TXT), Land XML, ZFS, ZFC, DBX format and support .imp format
35.	Should support direct export format ASCII point data (XYZ, SVY, PTS, PTX, TXT), DXF, Land XML, DBX format
36.	Must Provide 3D limit box to reduce point density
37.	Must provide automatic and manual point density control
38.	Must provide cloud to cloud registration capabilities
39.	Must support Dynamic level of detail management, displaying different levels of scanned data & 3D model for fast visualization
40.	Take measurement on scanned data, 3D models; slope distances; volumes and surface areas
41.	Must support visualization on mobile/tablet in both mode – online and offline
42.	Must support integration with Industrial GIS Platforms
43.	Must support integration with 3 D modelling software like sketch up Pro, AutoCAD
44.	Must support visualization with or without server
45.	Operating temperature for equipment minimum +5 to +40 Degrees Celsius
46.	Must be able to create a web share of the captured/Processed Data to be reviewed at any remote location on any normal configuration of Laptop/ Tablet online or offline.
47.	Laser Class must comply IEC 60825-1:2014
48.	Laser used to scan should be human safe
49.	Software application must support Integrated Virtual reality mode for better visualization
50.	Point cloud processing software should support all formats of cloud irrespective of hardware make and model
51.	Output created by Software should be supported by all 3D Formatting tools. Auto desk, solid works, cyclone, sketch up, fusion 360
52.	Application should support registration of multiple captures/scans/images automatically
53.	Service / Support of the equipment should be provided on PAN India basis.
54.	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
55.	OEM Should essentially have a local office in India.

TRAIL DIRECTIVES OF 3D LASER SCANNING AND IMAGING SYSTEM

1. Overview This specification identifies the minimum requirements for the 3D laser scanning and imaging system. Other components not identified or specified which are necessary for the system to meet required functionality are understood to be proposed and provided by vendor. The vendor is to state clearly aspects of products that are not compliant to specifications.

S No	Specifications	Trial Directives
<u>System Functionality</u>		
1.	System must provide automatic 3 D Scanning with 360 degree horizontal by 300 degree or better vertical field of view	Firm will submit OEM Certificate
2.	Ranging Accuracy 4mm or better at 10 mtr 7mm or better at 20 mtr With user selectable resolution settings	Firm will submit OEM Certificate & Data Sheets
3.	System must capture objects at minimum range of 0.65 mtr to maximum range of 60 mtr or better from axis of scanner (Radial Range)	Firm will submit Data Sheets
4.	System must use Waveform Digitization Technology for better results	Firm will submit OEM Certificate
5.	System must support at least IP54 rating for dust and water protection	Firm will submit OEM Certificate
6.	System must support upto 150 MP or better Panoramic image full dome capture, HDR, LED flash calibrated spherical image/IR based imaging	Firm will submit OEM Certificate & Data Sheet
7.	System must provide real time viewing & navigation of image during scan process	Board will check practically..
8.	System must operate on portable battery with minimum 3 hrs of operation or better per battery	Board will check practically.
9.	Must have scan time of roughly 4-5 minutes per position including image capture	Board will check practically.
10.	System must support either onboard memory for more than 100 setups OR at least 2 TB memory storage/ universal card formats like SD, SDHC, SDXC	Firm will submit OEM Certificate & Data Sheets
11.	System must provide data manipulation, visualisation and modelling capabilities such as creation of 2 D drawing and creation of CAD objects	Board will check practically.

S No	Specifications	Trial Directives
12.	System must support data registration, computation, analysis and modelling under one single software environment and in one single database upto the web publication phase, animation and 3 D modelling phase	Board will check practically.
13.	System must allow publication of point cloud into web-based format for online collaboration, support hyperlink, measurement, mark up inside Web browser. System should be simple to use and install and should not require server installation.	Board will check practically.
14.	System must come with Centralised Storage for high speed point cloud rendering with administrative privileges which allow a user to grant access to a particular project.	Board will check practically.
15.	System must be portable and easy to deploy preferably not more than 5 kg.	Board will check practically
16.	Data Acquisition rate must be minimum 350000 points per second or better	Firm will submit OEM Certificate & Data Sheets
17.	Digital camera must be integrated high resolution (150 MP or better)	Firm will submit OEM Certificate
18.	Capture instrument should support remote operation through WiFi for laptop and mobile device operations.	Board will check practically
20.	The Scanner shall be supplied with a Light weight Carbon Fibre Tripod, capable of handling 18kG of Payload weight	Board will check practically
21.	The offered equipment shall essentially support VR goggles consisting of a base station, controller link box, link box power adapter etc. After the base station is set up one shall be able to use VR goggles to visit the 3D scanned imagery inside out.	Board will check practically
22.	By using VR goggles, one should be able to visit the scanned 3D imagery (Here one feels as if he is practically present in that building/structure).	Board will check practically
23.	The Carrying Box of the solution should be waterproof	Firm will submit OEM Certificate

Software Specification		
24.	Software system must be able to handle unlimited size of point cloud database	Firm will submit OEM Certificate
25.	Software system must be client server based to allow a single storage of and dissemination of point cloud data	Board will check practically
26.	System must provide Sophisticated Crash & Post Event Reconstruction Tools	Board will check practically
27.	System must provide 2D and 3D viewing capability in synchronized views	Board will check practically
28.	System must provide minimum three registration methods and algorithms that can be used independently or in conjunction, namely 1) cloud-to-cloud matching 2) Known targets and 3) Automatic Visual Registration Tools.	Board will check practically
29.	System must provide Audit Logs for Evidence Integrity.	Board will check practically
30.	System must be compatible with Major Point Cloud handling and Publishing Softwares and should be able to conduct two way communications.	Board will check practically
31.	System must provide the ability to register and superimpose internal images automatically and external images (3D Cubic Map and single camera image) on scanned data for photo-realistic presentation	Board will check practically
32.	Provide various scene investigation tools like Bullet Trajectory, Animation for construction, Point Cloud overlay on images for measurement and analysis, View point analysis, Wizard for creating finished diagrams, Sketching mode	Board will check practically.
33.	Should support extraction of 2D drawings from 3 D models and scanned data	Board will check practically
34.	Should support direct import of .FLS, .3DD, ASCII point data (XYZ,SVY, PTS, PTX, TXT), Land XML, ZFS, ZFC, DBX format and support .imp format	Board will check practically and firm will also submit OEM Certificate

S No	<u>Specifications</u>	<u>Trial Directives</u>
35.	Should support direct export format ASCII point data (XYZ, SVY, PTS, PTX, TXT), DXF, Land XML, DBX format	Board will check practically and firm will also submit OEM Certificate
36.	Must Provide 3D limit box to reduce point density	Board will check practically
37.	Must provide automatic and manual point density control	Board will check practically
38.	Must provide cloud to cloud registration capabilities	Board will check practically
39.	Must support Dynamic level of detail management, displaying different levels of scanned data & 3D model for fast visualization	Board will check practically
40.	Take measurement on scanned data, 3D models; slope distances; volumes and surface areas	Board will check practically
41.	Must support visualization on mobile/tablet in both mode – online and offline	Board will check practically
42.	Must support integration with Industrial GIS Platforms	Firm will submit OEM Certificate
43.	Must support integration with 3D modelling software like sketch up Pro, AutoCAD	Firm will submit OEM Certificate
44.	Must support visualization with or without server	Firm will submit OEM Certificate
45.	Operating temperature for equipment minimum +5 to +40 Degrees Celsius	Firm will submit certificate of any Govt. Lab or NABL or (ILAC) accredited laboratory or OEM certificate.
46.	Must be able to create a web share of the captured/Processed Data to be reviewed at any remote location on any normal configuration of Laptop/ Tablet online or offline.	Board will check practically
47.	Laser Class must comply IEC 60825-1:2014	Firm will submit OEM Certificate & Data Sheet
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52.	Application should support registration of multiple captures/scans/images automatically	Board will check practically
53.	Service / Support of the equipment should be provided on PAN India basis.	Firm will submit OEM Certificate
54.	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	Firm will submit under taking Certificate
55.	OEM Should essentially have a local office in India.	Firm will submit OEM Certificate