



BHARAT COKING COAL LIMITED
(A Subsidiary of Coal India Limited)
Office of the Chief General Manager(MM)
Materials Management Department
Commercial Block L-III , Koyla Bhawan : Koyla Nagar
Dhanbad : 826005(Fax No- 0326-2230183)

PURCHASE ORDER NO. BCCL/PUR/715270/3D TLS/III/16-17/19/19-20/32

DATED 06.07.2019

BY REGD.POST / SPEED POST

To

M/s. Mea Tech Solutions LLP 1st Floor,Plot no.28, Sector-33 Gurgaon, Haryana 122004	(vendor code: 1/06/D/A/003)
	GSTIN No-06AAZFM0906E1Z8
	PAN no- AAZFM0906E
	gautam.bando@meatechsolutions.com anand.srivastava@meatechsolutions.com
	Mob: 9883669613

Sub: Purchase Order for Supply of 3D Terrestrial Laser Scanner along with 3 years CAMC

Ref. i) your offer against Our Tender No: BCCL/PUR/715270/3D TLS/III/16-17/19 dtd. 22.06.2016, opened on 10.08.2016 online and subsequent correspondences and offer validity extension thereof, latest being 31.05.2019

Dear Sir,

With reference to the above, we for and on behalf of BCCL hereby place PURCHASE ORDER on you for supply 1 No of 3D TLS(Terrestrial Laser Scanner) of range 2000 mtrs & 1 No of 3D TLS(Terrestrial Laser Scanner) of range 4000 mtrs to Bharat Coking Coal Limited., situated in Jharkhand State at the following price, terms and conditions:

1. Scope of Supply:

Particulars	Item sl no1	Item sl no 2
DESCRIPTION	3D TLS(Terrestrial Laser Scanner) of range 2000 mtrs(detail as per Annexure A) Make:RIEGL, Model:VZ-2000	3D TLS(Terrestrial Laser Scanner) of range 4000 mtrs(detail as per Annexure A) Make:RIEGL, Model:VZ-4000
NIT item sl no	1	3
Quantity(Nos)	1	1
HSN code	90158090	90158090
Total Basic(a)	₹ 152,86,274.00	₹ 187,48,412.00
P&F charges total(b)	20000	20000
Freight Total (c)	30000	30000
Insurance Total(d)	40000	50000
total basic without taxes	₹ 153,76,274.00	₹ 188,48,412.00
IGST@18% on total cost(a+b+c+d)	₹ 27,67,729.32	₹ 33,92,714.16
Landed Value in Rs.	₹ 181,44,003.32	₹ 222,41,126.16
CMPDIL inspection charges @1.00%	₹ 1,81,440.03	₹ 2,22,411.26
CGST 9% +SGST 9% i.e 18 % of inspection charge	₹ 32,659.21	₹ 40,034.03
Total Contractual value with CMPDIL charges	₹ 183,58,102.56	₹ 225,03,571.45
Total Landed Value for Equipment		₹ 408,61,674.01

Detailed Technical Specification shall be as per Annexure-A



	CAMC charges for VZ2000 and other accessories with spares per year			CAMC charges for VZ4000 and other accessories with spares per year		
CAMC charges after one year warrantee period	basic	GST@18%	Subtotal(A)	basic	GST@18%	Subtotal(B)
FY 2020-21	₹ 14,18,650.00	₹ 2,55,357.00	₹ 16,74,007.00	₹ 16,95,000.00	₹ 3,05,100.00	₹ 20,00,100.00
FY 2021-22	₹ 15,00,000.00	₹ 2,70,000.00	₹ 17,70,000.00	₹ 17,95,000.00	₹ 3,23,100.00	₹ 21,18,100.00
FY 2022-23	₹ 15,81,700.00	₹ 2,84,706.00	₹ 18,66,406.00	₹ 18,95,000.00	₹ 3,41,100.00	₹ 22,36,100.00
Total CAMC charges	₹ 45,00,350.00	₹ 8,10,063.00	₹ 53,10,413.00	₹ 53,85,000.00	₹ 9,69,300.00	₹ 63,54,300.00

The Total Contractual value will be ₹ 525,26,387.01/- rounded to ₹ 525,26,387/- Rs Five Crore twenty five Lakhs twenty six Thousand three hundred and Eighty seven only)

2. **PRICES:** The above prices are FIRM & FOR destination basis
3. **GST:** a) GST shall be paid extra as legally applicable. Present rate is @18% as indicated above
b) The invoice shall be raised by you giving all the details as per GST Act/ Rules so as to enable BCCL to avail Input Tax Credit.
c) You have to ensure proper uploading in your return so that BCCL may be able to avail Input Tax Credit.
d) If BCCL is not able to avail input tax credit due to your fault, then the amount of loss shall be recovered from you.
e) GST registration no of BCCL in case of supply for Jharkhand is 20AAACB7934MFZB and in case of supply for West Bengal is 19AAACB7934M2Z7, the same shall be indicated, your bill (cenvatable) should bear this number to enable BCCL to claim input tax credit.
4. **STATUTORY VARIATION:** In case of increase in rates of taxes within delivery period mentioned here under, the same shall be applicable to this order against documentary evidence. Any increase in taxes beyond the stipulated delivery period will be to your account. However benefits of any reduction in taxes shall be passed on to BCCL in all cases.
5. **PACKING FORWARDING:** Payable extra at actual subject to maximum@ Rs 20000.00 each as indicated above against documentary evidence.
6. **FREIGHT :** Payable extra at actual subject to maximum@ Rs 30000.00 each as indicated above against documentary evidence.
7. **INSURANCE:** Payable extra at actual subject to maximum@ Rs 40000.00 for item no 1 and @50000 for item sl no 2 as above against documentary evidence.
8. **CAMC: Terms of Comprehensive AMC, and Downtime penalty:**
 - a. Three years comprehensive annual maintenance charges inclusive of repair/replacement of all parts as may be required after expiry of guarantee/warranty period shall be as per tabulation above.
 - i. Half-yearly preventive maintenance and calibration checking at User's premises.
 - ii. Any number of breakdown maintenance and calibration servicing if required in case of breakdown the user shall communicate to the supplier by telephone/FAX/e-mail giving the nature of faults faced with machine generated code, if any. The supplier should attend the equipment at user's premises at the earliest possible time not exceeding 5 days.
 - iii. In case the equipment needs to be taken to the service center for breakdown maintenance or for any other reason, it shall be the responsibility of the supplier and user shall bear no financial implication in the regard.

- iv. The aim of the CAMC is to maintain at least 90% availability of the equipment for its satisfactory working. In case availability falls below 90%, a down time penalty on pro-rata basis will be imposed as per laid down terms and conditions given in DOWN TIME PENALTY below separately.
 - v. It will be the responsibility of the supplier to contact BCCL (HOD (Survey)) and enter into the agreement well before expiry of the Warranty period.
 - vi. On the basis of requirement the equipment may be deployed at our different Areas / Collieries under administrative control of Bharat Coking Coal Ltd.
 - vii. Detail terms and conditions of the CAMC agreement will be prepared on the basis of discussion & mutual agreement between user and supplier, without changing the above terms in principle.
 - b. You shall guaranty 90% availability (uptime) for the equipment for satisfactory working.
 - c. The machine downtime will be reckoned only for the working days of BCCL. For example, if equipment remains under breakdown for 10 days in which 3 days are holidays then effective breakdown days will be considered as 7 days.
 - d. Breakdown period in days will start from the day of reporting breakdown to the party by telephone/FAX/e mail and it is handed over to the user in working conditions.
 - e. The availability percentage will be calculated for each half year i.e. six monthly. Penalty will be imposed on pro-rata basis, if the availability falls below 90%. Thus $\text{Penalty} = (90\% - \text{actual availability } \%) \times (\text{CAMC charge}/2)/90\%$
 - f. No bonus or additional sums shall be payable if the availability is more than 90%.
 - g. Actual availability percentage for each equipment will be calculated as follows : - $(\text{No of working days during half year} - \text{Effective breakdown days during the half year} \times 100) / \text{No of working days during Half year} = \text{Actual availability}\%$
 - h. Penalty for the half year will be calculated basis of the table below: Availability % percentage (rounded) Penalty 90% and above Nil 75 % to 90 % As per calculation mentioned above. 50% to 75 % Double the calculated amount as per rate calculation mentioned above. Below 50% No CAMC payment for that half year.
 - i. Payment terms for "maintenance Charges (MC)" : i) The half yearly MC bills (being the pro rata amount for six months of the 'Annual Maintenance Charges') along with the 'Service Report' for the preceding six months and the 'Completion Certificate' from the concerned Head of the user department (HOD Survey) shall be raised after the completion of each half year which will be paid after receipt and acceptance of the same. Penalty Charges for the preceding six months, if any, shall be recovered from the half yearly bill. During the "Contract Period" no interest is payable on any amount whatsoever to the successful Bidder/Supplier if any.
9. **PAYMENT TERM:**
- a) 80% value of the equipment and spares and consumables for warranty period and 100% taxes and duties and other charges shall be made after receipt and acceptance of materials at site by the consignee and Performance Bank Guarantee, within 21 days from the date of receipt and acceptance of materials at stores or the date of submission of bills whichever is later subject to receipt and acceptance of PBG.
 - b) Balance 20% payment shall be made after successful completion of erection, testing, commissioning and final acceptance of the equipment (along with the accessories) upon presentation of successful commissioning report duly countersigned by HOD of Technical Deptt i.e HOD(Survey) of Bharat Coking Coal Ltd.
- The supplier must submit a price certificate in all their invoices in the following format," It is certified that the price indicated in this invoice is not higher than the amount billed to other Govt. organisations/PSU/Private organisation in India.
10. **DELIVERY PERIOD:** Supply should be completed within 120 days from the issue of purchase order. Early delivery shall be acceptable. The delivery shall be on FOR- destination basis and delivery period shall be counted from date of issue of order

The Performance Bank Guarantee shall be released after fulfilment of all contractual obligations including warranty /guarantee conditions stipulated in the contract. For unsatisfactory performance and/or contractual failure, BCCL shall have the full right to invoke/en-cash the Performance Bank Guarantee. The Bank guarantee issued by the Bank on behalf of the supplier in favour of "Bharat Coking Coal Limited" shall be in paper form as well as issued under "Structural Financial Messaging System". The detail of beneficiary for issue of BG under SFMS platform is furnished below:

Name of beneficiary & its details	Name	Bharat Coking Coal Limited
	Area	HQ,BCCL
	Bank Account no.	35160317947
	Deptt.	MM Department
Beneficiary Bank, Branch & Address	State Bank of India	
	Main Branch Dhanbad	
IFSC code	SBIN0000066	

Or

Name of beneficiary & its details	Name	Bharat Coking Coal Limited
	Area	HQ,BCCL
	Bank Account no.	019605001057
	Deptt.	MM Department
Beneficiary Bank, Branch & Address	ICICI Bank	
	ICICI Bank, Dhanbad	
IFSC code	ICIC0000196	

The above particulars are to be incorporated by the issuing Bank properly while issuing BG under SFMS mode to avoid any problem in future. The Performance Bank Guarantee shall be issued by a scheduled bank in the format attached as ANNEXURE - G

The original Bank Guarantee issued by the issuing Bank shall be sent by the issuing Bank to the beneficiary (MM Department), BCCL by Registered Post (A.D.).

14. **SECURITY DEPOSIT:** You will be required to deposit as security money 10% of the value of the contract (including Taxes, duties, and other charges to the FOR Destination prices i.e. for Rs. 52,52,640/- without having any ceiling in the form of Bank Draft /Bank Guarantee (As per format given in NIT) within 15 days from the date of order. The validity of B.G. will be for a period of three months beyond the expiry of delivery period .If you fail to deposit the security deposit within 15(fifteen) days from the date of order, the same shall be recorded as unsatisfactory performance for future dealings apart from taking any other penal action as may be deemed fit by BCCL. For successful supply, the Security Money shall be refunded within 30 days of satisfactory execution of contract. For unsatisfactory execution of contract and/or failure of execution of contract, the security money shall be forfeited. For orders with Performance Bank Guarantee Clause, the Security Deposit shall be refunded after successful completion of the supply/commissioning (wherever applicable) and against receipt of the acceptable performance Bank Guarantee. The Bank guarantee issued by the Bank on behalf of the supplier in favour of "Bharat Coking Coal Limited" shall be in paper form as well as issued under "Structural Financial Messaging System". The detail of beneficiary for issue of BG under SFMS platform is furnished below:

Name of beneficiary & its details	Name	Bharat Coking Coal Limited
	Area	HQ,BCCL
	Bank Account no.	35160317947
	Deptt.	MM Department
Beneficiary Bank, Branch & Address	State Bank of India	
	Main Branch Dhanbad	
IFSC code	SBIN0000066	

Or

11. **GUARANTEE/ WARRANTY:** The firm shall guarantee that the material offered shall meet the rating & performance requirement stipulated in this specification. The guarantee shall be for a minimum period of 12 months from the date of commissioning. Any defect observed on this account shall be attended to immediately and in no case beyond a period of one month. You will be required to stock spare parts to take care of warranty failures. Spares should be available within 2 weeks of the breakdown being intimated. The guarantee/composite warranty shall be submitted along with the bill. The warranty shall cover for the total equipment so that the necessity of having to approach different manufacturers of various components/assemblies does not arise and all services under warranty clause shall be the responsibility of the ultimate supplier of the composite equipment. You will also replace the defective parts, if any, during the warranty period free of cost. The responsibility to collect the defective / rejected material will lie with the supplier and the cost for such collection will have to be borne by you.

12. **PENALTY FOR DELAY IN SUPPLY (L. D. CLAUSE):** The delivery of stores stipulated in Purchase order shall be deemed to be of the essence of the contract and delivery of the stores must be completed by the date specified. No materials should be supplied beyond the specified delivery period, unless specific approval has been obtained from this office.

In the event of failure to deliver the stores within the stipulated date/ period in accordance with the samples and/or specification mentioned in the supply order, and in the event of breach of any terms and conditions mentioned in the supply order Bharat Coking Coal Limited reserves the right:

(a) To recover from you, as agreed liquidated damages, a sum not less than 0.5% (half percentage) of the price of the stores which you have not been able to supply (for this purpose part of a unit supplied will not be considered) as aforesaid for each week or part of a week during which the delivery of such stores may be in arrears limited to 10%. Where felt necessary the limit of 10% can be increased to 15% at the discretion of Head of the Materials Management Division.

(b) To cancel the supply order or a portion thereof, and if so desired to purchase the store at your risk and cost and also

(c) To purchase elsewhere, after due notice to you, on your account and risk, the stores not supplied or others of a similar description without canceling the supply order in respect of consignment not yet due for supply or

(d) To extend the period of delivery with or without penalty as may be considered fit and proper. The penalty, if imposed shall not be more than the agreed liquidated damages referred to in clause (a) above.

(e) To encash any Bank guarantee which is available for recovery of the penalty or

(f) To forfeit the security deposit full or in part.

(g) Whenever under the contract a sum of money is recoverable from and payable by you, BCCL shall be entitled to recover such sum by appropriating, in part or whole by deducting any sum or which at any time thereafter may be due you in this or any other contract with Bharat Coking Coal Ltd. or any subsidiary of Coal India Ltd. Should this sum be not sufficient to cover the full amount recoverable, you will pay BCCL on demand the remaining amount. You will not be entitled to any gain under this clause

13. **PERFORMANCE BANK GUARANTEE(PBG):** PBG on schedule / Nationalized Bank in India valid for three months beyond the expiry of Guarantee/Warranty period and CAMC period i.e. for 51 months for 10% value of the supply order (by adding GST etc. to the FOR destination price of the items ordered) i.e. for Rs. 52,52,640/- shall have to be submitted to MM Division, BCCL, Koyla Bhawan on or before commencement of supply

The original Bank Guarantee should be sent to the beneficiary directly by the issuing bank under registered post with A.D

However in exceptional cases, where the Bank Guarantee is handed over to the customer for any genuine reasons, the issuing bank should immediately send by Registered Post with A.D an unstamped duplicate copy of the BG directly to the beneficiary with a covering letter requesting them to compare with the original received from supplier and confirm that it is in order. The A.D card should be kept with the loan papers of the relevant BG.

Name of beneficiary & its details	Name	Bharat Coking Coal Limited
	Area	HQ, BCCL
	Bank Account no.	019605001057
	Deptt.	MM Department
Beneficiary Bank, Branch & Address	ICICI Bank	
	ICICI Bank, Dhanbad	
IFSC code	ICIC0000196	

The above particulars are to be incorporated by the issuing Bank properly while issuing BG under SFMS mode to avoid any problem in future. The Security Deposit Bank Guarantee shall be issued by a scheduled bank in the format attached as ANNEXURE - F

The original Bank Guarantee issued by the issuing Bank shall be sent by the issuing Bank to the beneficiary (MM Department), BCCL by Registered Post (A.D.).

15. **PRICE FALL CLAUSE:** The supplier undertakes that it has not supplied /is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the supplier to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the supplier to BCCL, if the contract has already been concluded.
16. **CONSIGNEE:** The Depot Officer, Central store Ekra, BCCL, Dhanbad.
17. **PAYING AUTHORITY:** HOD(F) MM, KoylaBhawan, Dhanbad.
18. **INSPECTION:** Pre-despatch Inspection shall be carried out by CMPDIL, Ranchi at your Works premises. Inspection Fees @1% on FOR destination price and GST @18% on inspection charges shall be paid initially by you along with your Inspection Call, which shall be subsequently reimbursed by BCCL along with your supply bills against documentary evidence e.g. money receipt etc. Final inspection at consignee end by HOD (Survey) or his authorized representative.
19. **PRICE CERTIFICATE:** A Price certificate as stated below, should be submitted along with supply bill:
"The rates of the stores under this contract are the lowest at which we are selling to any other customer/Govt. Deptt. / Subsidiaries of CIL/ Other PSUs. If the materials are sold at any lower rate than that mentioned in this contract to any other agency, the same will automatically be applied to this contract from that date"
20. **SUBMISSION OF BILL:** Bill as per GST Act/rules along with, delivery challan in original, Guarantee/ Warranty certificate, and other relevant documents should be submitted to the Paying Authority through Consignee only. The details of your bank account shall be mentioned in your Bill to facilitate e-payment.
21. **PACKING:** Consignment shall be supplied in suitable standard proper packing.
22. **IMPORT DOCUMENTS:**
The consignment being imported in nature, the following documents also need to be submitted with the supply:
 - i) Their foreign principal's invoice or packing list – original as well as certified photocopy.
 - ii) Certified photocopy of Bill of Lading drawn in favour of Indian authorized Dealer.
 - iii) Bill of Entry – Original as well as certified photocopy.
 - iv) Certificate of country of origin
 You shall provide clear linkage of items as per order with documents furnished under clause (i), (ii) and (iii) for acceptance by BCCL.
 Note: The original documents under (i) and (iii) shall be returned after verification with attested photocopy and making endorsements on original relating to transaction made..

Signature

Signature



AUDITORS CERTIFICATE FOR IMPORTED ITEM : For the items imported by the firm, a certificate from the auditor of the supplier certifying that the custom duty has been paid as per prevailing Custom rates and refund, if any shall be passed on to the buyer and submitted with each supply.

23. **ISSUE OF E WAY BILL:** The supplier shall generate E-Waybill, wherever required.

ALL DISPUTES ARE SUBJECT TO DHANBAD COURT AND JHARKHAND HIGH COURT JURISDICTION ONLY.

This contract is concluded with the issuance of this Order. Two copies of the Purchase Order are being sent to you. You are advised to acknowledge the receipt and acceptance of the Order by returning one copy duly signed and stamped to this office positively within 15 days, failing which this contract shall be deemed to have been accepted by you for execution.

All other terms and conditions shall be applicable as per NIT.

This issues with approval of competent authority.

Yours faithfully,
For and on behalf of
Bharat Coking Coal Limited


(Sonu Gupta)
Dy.Mgr. (MM)


(N.S. Saini)
GM (MM)

INDENT REFERENCE:

Sr.No	Indent no. and Date	BC & FC no. & dt.	Indenting Authority
1	BCCL/CS/F-instrument/indent/15/7507 dtd 10.9.15 IR No: 715270 dtd. 19.02.2016	Adhoc e.BC.No : BCCL/C&B/Cap/Reg. PN-02/eBC No-23 dtd. 15.05.2019 of ₹ 408,61,674.01/- eFC no 44 dated 06.07.19 for ₹ 408,61,674/- Advance revenue budget of Rs 116,64,713/- communicated vide letter no BCCL/Fin(C&B)/19/D/98 dated 06/07/2019	HOD(Survey) BCCL, Dhanbad.

ENCL:

1. Annexure 'A' for Technical Specifications
2. Format for Bank guarantee for Security Deposit and Performance Bank Guarrantee
3. Format for CMPDIL inspection call
4. Technical brochure submitted by you along with your offer

Copy to:

1. HOD(Survey), BCCL. Koyla Bhavan, Dhanbad.
2. HOD(F)MM, BCCL. Koyla Bhavan, Dhanbad.
3. Depot Officer, Ekra Central Stores. P.O: - Bansjora, BCCL, Dhanbad-828101
4. MM(Tech Cell), MM Div,Koyla Bhawan
5. GM (E&M) Inspection, CMPDIL, Gondwana Place, Kanke Road, Ranchi-834008, Jharkhand.
6. GM(MM) CIL, CCL,ECL,WCL,NCL,SECL,NEC
7. Office Copy/Master Copy/Tech .

Copy also to by Air Mail

M/S RIEGL Measurement Systems GmbH, A 3580 Horn, Riedenburgstrasse 48,Austria.

Annexure –A-Technical Specifications

Commercial Offer for RIEGL 3D Terrestrial Laser Scanner for 2000 m range with accessories (A-I)		
SL NO	Description of Goods	Qty
1.1	3D Laser Scanner RIEGL make VZ- 2000 with a maximum range of 2000m	1 Set
	<ul style="list-style-type: none"> Class 1 Laser, maximum measurement speed of 3,96,000 points per second and 21,000 points per second at maximum distance of 2 Km (90% reflectivity) V +60 degree to - 40 degree. Hz 360 degree view scan capacity. Tilt mount quoted in the accessories Accuracy of 8 mm TFT Color touch screen Display and Key Board 64 GB internal memory for data storage Integrated internal GPS receiver (L1). (With Antena) Integrated compass Integrated Laser plummet Internal power Supply electronics Integrated Inclination sensors of +/- 10 degree Internal synchronise timer for GPS synchronised time stamping of data 	
1.2	Electrical Interfaces, Integrated <ul style="list-style-type: none"> LAN interface 10/100/1000 Mbit/s within rotating head LAN interface 10/100 Mbit/s within base Integrated WLAN interface with two different rod antennas USB 2.0 for external storage devices (USB Flash drives external HDD) Holder for GPS antenna Two connectors for external power supply Connector for serial interface and GPS Synchronization pulse (1PPS) 	
1.3	Mechanical Interfaces, Integrated <ul style="list-style-type: none"> WSK Standard Tripod Mounting Thread High Precision mounting pads for Camera mount on top 	
1.4	Cables <ul style="list-style-type: none"> TCP/IP Cable M12-M12 3M TCP/IP cable M12-RJ45 0.3 M TCP/IP cable M12-RJ45 cross Over 0.3m Serial data & PPS cable to GPS Receiver 3m Power Supply Cable 2 pole/7pole 3m Adapter cable, 1m from power supply cable to banana plugs Adapter Cable, 1m from power supply cable to cigarette lighter plug 	
2	User Manual (In English Language) for hardware and software (Hard copy and Soft copy)	1



Signature

Signature



A-1

3	Firmware Options	
•	Function for Automatic Reflector Search, Fine-Scanning	1
	Software Options	
4.1	RISCAN PRO Viewer, Acquisition & Processing Software	1lic
4.2	RISCAN PRO Plug-in Camera Model	1lic
4.3	RISCAN PRO Plug-in Multi Station Adjustment Model	1 lic
4.4	R-MINING Software for Automatic data processing	1 lic
	5 Power Supply Modules	
•	AC Power Supply Unit	1
•	Adapter Cable: 1m from 7 pole supply cable to 12 V Pb Gel Battery	1
•	External rechargeable Battery as per NIT (resourced from the OEM) with charging cable & adapter	2
6	Carrying Cases	
•	Carrying case for Scanner, camera & Laptop	1
7	Other Accessories	
•	High Precision External Camera Mount	1
•	Integrated calibrated 36 Mega Pixel Camera controlled by software of 3D Laser Scanner	1
•	Nikor 20mm/2.8D Lens	1
•	Lens Adapter and Protection tube for Nikon Lens AF D20/2.8 NIKKOR	1
•	Stable professional Wooden Tripod	1
•	Scanner Trip Mount	1
•	Circular Retro Reflectors	2
•	Range Pole	2
•	Bipod for Range Pole	4
•	External Hard Drive for storage via USB interface	1
•	Branded Laptop from HP model ProBook 450 of reputed make with Intel core i5, 8 GB RAM, 1TB HDD & 2GB Graphics card, DVD Writer, 15.5" monitor, Windows 8 or better compatible with the software with all standard accessories all as per NIT	1
•	Installation and commissioning will be done by us as per NIT	
•	Training as per NIT	
•	Warranty as per NIT	
•	Delivery as per NIT	
•	CAMC as per NIT	



See

See

Commercial Offer for RIEGL 3D Terrestrial Laser Scanner for 4000 m range with accessories (A- III)

SL NO	Description of Goods	Qty
1.1	3D Laser Scanner RIEGL VZ- 4000 with a maximum range of 4000m	1 Set
	<ul style="list-style-type: none"> Class 1 Laser, maximum measurement speed of 2,22,000 points per second and 37,000 points per second at maximum distance of 4 Km (90% reflectivity) V +30 degree to - 30 degree, Hz 360 degree view scan capacity. Tilt mount quoted in the accessories. Accuracy of 15 mm 7" WVGA inbuilt Color touch screen Display and Key Board 80 GB internal memory for data storage Integrated internal GPS receiver (L1) (With Antenna) Integrated compass Integrated laser plummet Internal power Supply electronics Integrated inclination sensors of +/- 10 degree Internal synchronise timer for GPS synchronised time stamping of data 	
1.2	Electrical Interfaces, Integrated	
	<ul style="list-style-type: none"> LAN interface: 10/100/1000 Mbit/s within rotating head LAN interface: 10/100 Mbit/s within base Integrated Wi LAN interface with two different rod antennas USB 2.0 for external storage devices (USB Flash drives, external HDD) USB 2.0 for connecting the optional digital camera Holder for GPS antenna Two connectors for external power supply Connector for serial interface and GPS Synchronization pulse (1PPS) 	
1.3	Mechanical Interfaces, Integrated	
	<ul style="list-style-type: none"> W5/8" Standard Tripod Mounting Thread High Precision mounting pads for Camera mount on top 	
1.4	Cables	
	<ul style="list-style-type: none"> TCP/IP Cable M12-M12 3M TCP/IP cable M12-RJ45, 0.3 M TCP/IP cable M12-RJ45 cross Over, 0.3m Serial data & RS485 cable to GPS Receiver 3m Power Supply Cable 2 pole/2pole, 3m Adapter cable 1m from power supply cable to banana plugs Adapter Cable 1m from power supply cable to cigarette lighter plug 	
2	User Manual (In English Language) for Hardware and software (Hard copy and Soft copy)	

Smt

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A - 11

3	Firmware Options	
•	Function for Automatic Reflector Search, Fine-Scanning	1
	Software Options	
4.1	RiSCAN PRO Viewer, Acquisition & Processing Software	1Lic
4.2	RiSCAN PRO Plug-in Camera Model	1Lic
4.3	RiSCAN PRO Plug-in Multi Station Adjustment Model	1Lic
4.4	RiMINING Software for Automatic data processing	1Lic
5	Power Supply Modules	
•	AC Power Supply Unit	1
•	Adapter Cable 1m from 7 pole supply cable to 12 V Pb Gel Battery	1
•	External rechargeable Battery as per NIT (resourced from the OEM) with charging cable & adapter	2
6	Carrying Cases	
•	Carrying case for Scanner and camera & Laptop	1
7	Other Accessories	
•	High Precision External Camera Mount	1
•	Integrated calibrated 36 Mega Pixel Camera controlled by software of 3D Laser Scanner	1
•	Nikor 20mm/2.8D Lens	1
•	Lens Adapter and Protection tube for Nikon Lens AF D20/2.8 NIKKOR	1
•	Stable professional Wooden Tripod	1
•	Scanner Tilt Mount	1
•	Circular Retro Reflectors	6
•	Range Pole	5
•	Bipod for Range Pole	4
•	External Hard Drive for storage via USB interface	1
•	Branded Laptop from HP model ProBook 450 of reputed make with Intel core i5 8 GB RAM 1TB HDD & 2GB Graphics card, DVD Writer, 15.5" monitor, Windows 8 or better compatible with the software with all standard accessories all as per NIT	1
•	Installation and commissioning will be done by us as per NIT	
•	Training as per NIT	
•	Warranty as per NIT	
•	Delivery as per NIT	
•	CAMC as per NIT	



Signature

Signature

Technical Parameter Sheet

Tender Inviting Authority: GM (MM) BCCL HQ
Name of Work: Supply of 3D Terrestrial Laser Scanner (TLS) of different range (i.e. 2000 mtrs., 3000 mtrs. & 4000 mtrs.) with accessories and software with CAMC for three years after warranty period
NT No: BCCL/PUR/715270/3D TLS/III/16-17/19
Bidder Name: MEATECH SOLUTIONS LLP

TECHNICAL PARAMETER SHEET										
S. No.	Item Code	Description of Item *	Bidder's Eligibility Status	Specification Parameter *	Unit of Measure *	Evaluation Criteria (To be selected from drop down box in each cell) *	Required Value *	Bidder's value *	Eligibility	
									Specification wise	Overall
1	item1	1 (One) Number of 3D LASER Scanner (2000 Mtr.) WITH ACCESSORIES	0	3D LASER Scanner	IN NUMBER	EQUAL TO	1	1	TRUE	
		Laser Class: The Instrument must be of Class I Laser with eye safe			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		Scanning Range: The range of instrument is required to be 2000 Mtrs or more (with 90% reflectivity) in Indian open cast mining environment			Mtr	EQUAL or MORE than	2000	2000	TRUE	
		Field of View / Measurement: Field of view and continuous measurement of the instrument without any external attachment must be			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		A) Vertical: +30 / -30 degrees or more and tilting facility of the instrument			Degree	EQUAL or MORE than	30	40	TRUE	
		B) Horizontal: 360 Degrees			Degree	EQUAL TO	360	360	TRUE	
		Data Capturing Rate: The instrument should have a measurement speed of 1,00,000 Points Per seconds or more irrespective of distance.			In number Maximum	EQUAL or MORE than	100000	396000	TRUE	
		Data Capturing Rate: The instrument should have a measurement speed not less than 15000 points per second for the maximum range of measurement i.e. 2000 mtrs or more.			In number Minimum	EQUAL or MORE than	15000	21000	TRUE	
		Measurement Accuracy: 15mm or better.			mm	EQUAL or LESS than	15	8	TRUE	
		Digital Camera: The System should have integrated calibrated camera with a resolution of 36MP or more. It should be controlled by the software of the 3D Laser Scanner. Over and above internal camera of any mega pixel is accepted.			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		Display & Key board: The instrument should have VGA or TFT colour display. It should have also necessary soft or touch keys for configuring the instrument on user defined mode and viewing the data in the field itself. Scanner independent controller may be accepted over and above in built color display & key board. Accordingly scanner independent controller may be quoted optionally in addition to the in built color display & key board.			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		Data Storage: The instrument should have : a) Internal memory of 60 GB or more and b) External Flash drives or external Hard Drives, via USB 2.0 interface			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		Environmental: It should be rugged to suit Indian Coal Mining Conditions. Instrument should be usable under the general and also fire effected mining atmospheric condition.			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		On- Board Inclination: The instrument should have inclination sensors with a tilt range of +/-10 degrees or more			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		Compass: The instrument should have an integrated compass with accuracy typ. 1deg or better.			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		Power Supply: Through maintenance free Internal OR External rechargeable Battery (From OEM resource) having sufficient capacity of continuous scanning operation for 5 to 8 hours, having facility for charging with connecting cable etc. 2 (Two) numbers batteries with each TLS to be provided.			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		Protection Class: Should confirm IP:64 or better with dust & water proof.			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		GPS Connectivity: The scanner should have Built in L1 GPS (single frequency).			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		SOFTWARE REQUIREMENT: Should be capable of deliver the following			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		1. User Should able to view the data to analyze if there is any shadow zone			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		2. Standard Software to store and Process data			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		3. Data should be compatible to other mining software like SURPAC, AUTOCAD etc			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		4. Preparation of Digital Terrain Model (DTM)			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		5. Generation of Contours as per user selectable interval			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
		6. Automatic Tee & Crest creation / joining			NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	

Tender Inviting Authority: GM (MM) BCCL HQ
 Name of Work: Supply of 3D Terrestrial Laser Scanner (TLS) of different range (i.e. 2000 mtrs., 3000 mtrs. & 4000 mtrs.) with accessories and software with CAMC for three years after warranty period.
 NIT No: BCCL/PUR/715270/3D TLS/III/16-17/19
 Bidder Name: MEATECH SOLUTIONS LLP

TECHNICAL PARAMETER SHEET

S. No.	Item Code	Description of Item	Bidder's Eligibility Status	Specification Parameter	Unit of Measure	Evaluation Criteria (To be selected from drop down box in each cell)	Required Value	Bidder's value	Eligibility	
									Specification wise	Overall
				7. Mesh modelling, Area calculation, Volume calculations through DTM to DTM or bisection as desired by user	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	COMPLIED
				8. Cut & fill volume measurement.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				9. Data visualization in 2D or 3D, in true color.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				10. Data registration of the scan data into Local / SI coordinates systems	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				The software must automatically do the following tasks:	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				1. Must be able to survey open pit mines, dumps & quarries	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				2. Facility to detect the change in the excavated sites	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				3. Facility for doing fill grade & mass calculations	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				4. Must be able to extract the input data for site modelling	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				6. Must be able to extract features	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				7. Must have facility of automatic data registration	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Field Demonstration by the bidder:	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				The parties may be called for practical field demo and process the DATA in the field it self on the same day.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Accessories to be quoted with each of the 3D TLS as mentioned below	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				One number branded laptop with each 3D TLS with 8GB RAM or higher and 1 TB hard disk. Intel core i5 processor or higher. Suitable for scanner DATA acquisition and processing work having windows 8 or above OS (preloaded with CD or DVD), 15.5 inch or bigger screen, 2 GB or higher graphics card, DVD writer internal/external, USB port 3 or more, USB Mouse, digital media reader, integrated 10 / 100 / 1000 GB Ethernet LAN, Wi-Fi accessibility, Battery for 4 Hours or more Backup, Charger, all necessary accessories.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Stable professional wooden universal tripod of Original manufacturer	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Holder for GPS antenna	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Internal synchronized timer for GPS synchronized time stamping of data	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				All cable of sufficient length for transmitting scan data to laptop, camera data to laptop, power supply cables, adapter cables for internal battery and external battery etc.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Reflectors for setting of the system	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Carrying case for hardware & laptop	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Charger for battery	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Hardware & software manuals (Both in Hard and Soft Copy)	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Any other accessory to make system fully functional should be quoted	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Commissioning and installation will be done by the supplier free of cost at the user specified site within BCCL command Area.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Inspection, training & trial execution: 1. Installation, training cum trial execution - (a) one month training on installation, data execution and data processing will be carried out in open cast mines. 2. One week after 3 months of initial training on 3D laser scanner.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Warranty / Guaranty: One Year full warranty from the date of installation, for laser scanner & associated accessories.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				CAMC: Comprehensive Annual Maintenance Contract for a period of THREE years (with Spares) after the standard warranty period of one year. (As specified BELOW)	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Delivery schedule as per NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Guarantee / Warranty clause as per NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Proven-ness criteria & Eligibility criteria as per Annexure-I of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Is your firm/company MSME registered for this item?	NA	YES or NO	YES	YES	TRUE	
				Specify offered quantity:	NA	NOT NULL	NOT NULL		TRUE	

Tender Inviting Authority: GM (MM) BCCL HQ
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 NIT No: BCCL/PUR/715270/3D TLS/III/16-17/19
 Bidder Name: MEATECH SOLUTIONS LLP

TECHNICAL PARAMETER SHEET

S. No.	Item Code	Description of Item	Bidder's Eligibility Status	Specification Parameter	Unit of Measure	Evaluation Criteria (To be selected from drop down box in each cell)	Required Value	Bidder's value	Eligibility	
									Specification wise	Overall
3	Item3	1 (One) Number of 3D LASER Scanner (4000 Mtr.) WITH ACCESSORIES	C	Specify make and model:	NA IN NUMBER	NOT NULL EQUAL TO	NOT NULL 1	Regd VZ-4000 1	TRUE	
				Laser Class: The instrument must be of Class I Laser with eye safe	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Scanning Range: The range of instrument is required to be 4000 Mtrs or more (with 90% reflectivity) in Indian open cast mining environment	Mtr	EQUAL or MORE than	4000	4000	TRUE	
				Field of View / Measurement: Field of view and continuous measurement of the instrument with out any external attachment must be	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				A) Vertical: +30 / -30 degrees or more and tilting facility of the instrument	Degree	EQUAL or MORE than	30	30	TRUE	
				B) Horizontal: 360 Degrees	Degree	EQUAL TO	360	360	TRUE	
				Data Capturing Rate: The instrument should have a measurement speed of 1,00,000 Points Per seconds or more irrespective of distance.	In number Maximum	EQUAL or MORE than	100000	222000	TRUE	
				Data Capturing Rate: The instrument should have a measurement speed not less than 15000 points per second for the maximum range of measurement i.e. 4000 mtrs or more.	In number Minimum	EQUAL or MORE than	15000	37000	TRUE	
				Measurement Accuracy: 15mm or better	mm	EQUAL or LESS than	15	15	TRUE	
				Digital Camera: The System should have integrated, calibrated camera with a resolution of 36MP or more. It should be controlled by the software of the 3D Laser Scanner. Over and above internal camera of any mega pixel is accepted.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Display & Key board: The instrument should have VGA or TFT colour display. It should have also necessary soft or touch keys for configuring the instrument on user defined mode and viewing the data in the field itself. Scanner independent controller may be accepted over and above in built color display & key board. Accordingly scanner independent controller may be quoted optionally in addition to the in built color display & key board.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Data Storage: The instrument should have : a) Internal memory of 60 GB or more and b) External Flash drives or external Hard Drives, via USB 2.0 Interface	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Environmental: It should be rugged to suit Indian Coal Mining Conditions. Instrument should be usable under the general and also fire effected mining atmospheric condition.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				On- Board Inclination: The instrument should have inclination sensors with a tilt range of +/-10 degrees or more	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Compass: The instrument should have an integrated compass with accuracy typ.1deg or better.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Power Supply: Through maintenance free Internal OR External rechargeable Battery (From OEM resourced) having sufficient capacity of continuous scanning operation for 5 to 8 hours, having facility for charging with connecting cable etc. 2 (Two) numbers batteries with each TLS to be provided.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Protection Class: Should confirm IP-64 or better with dust & water proof.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				GPS Connectivity: The scanner should have Built in L1 GPS (single frequency).	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				SOFTWARE REQUIREMENT: Should be capable of deliver the following	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				1. User Should able to view the data to analyze if there is any shadow zone	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				2. Standard Software to store and Process data	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				3. Data should be compatible to other mining software like SURPAC, AUTOCAD etc	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				4. Preparation of Digital Terrain Model (DTM)	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				5. Generation of Contours as per user selectable interval	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	

Tender Inviting Authority: GM (MM) BCCL HQ
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Bidder Name: MEATECH SOLUTIONS LLP

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									Specification wise	Overall
				6. Automatic Toe & Crest creation / joining	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	COMPLIED
				7. Mesh modelling, Area calculation, Volume calculations through DTM to DTM or bisection as desired by user	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				8. Cut & fill volume measurement.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				9. Data visualization in 2D or 3D, in true color.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				10. Data registration of the scan data into Local / SI coordinates systems	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				The software must automatically do the following tasks:	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				1. Must be able to survey open pit mines, dumps & quarries	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				2. Facility to detect the change in the excavated sites.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				3. Facility for doing fill grade & mass calculations	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				4. Must be able to extract the input data for site modelling	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				6. Must be able to extract features	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				7. Must have facility of automatic data registration	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Field Demonstration by the bidder:	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				The parties may be called for practical field demo and process the DATA in the field it sell on the same day.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Accessories to be quoted with each of the 3D TLS as mentioned below	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				One number branded laptop with each 3D TLS with 8GB RAM or higher and 1 TB hard disk Intel core i5 processor or higher. Suitable for scanner DATA acquisition and processing work having windows 8 or above OS (preloaded with CD or DVD), 15.5 inch or bigger screen, 2 GB or higher graphics card, DVD writer internal/external, USB port 3 or more, USB Mouse, digital media reader, integrated 10 / 100 / 1000 GB Ethernet LAN, Wi-Fi accessibility, Battery for 4 Hours or more Backup, Charger, all necessary accessories.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Stable professional wooden universal tripod of Original manufacturer	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Holder for GPS antenna	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Internal synchronized timer for GPS synchronized time stamping of data	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				All cable of sufficient length for transmitting scan data to laptop, camera data to laptop, power supply cables, adapter cables for internal battery and external battery etc.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Reflectors for setting of the system	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Carrying case for hardware & laptop	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Charger for battery	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Hardware & software manuals (Both in Hard and Soft Copy)	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Any other accessory to make system fully functional should be quoted	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Commissioning and installation will be done by the supplier free of cost at the user specified site within BCCL command Area.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Inspection , training & trial execution: 1. Installation, training cum trial execution - (a) one month training on installation, data execution and data processing will be carried out in open cast mines. 2. One week after 3 months of initial training on 3D laser scanner.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Warranty / Guaranty: One Year full warranty from the date of installation, for laser scanner & associated accessories.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				CAMC: Comprehensive Annual Maintenance Contract for a period of THREE years (with Spares) after the standard warranty period of one year (As specified BELOW)	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Delivery schedule as per NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Guarantee / Warranty clause as per NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Proven-ness criteria & Eligibility criteria as per Annexure-I of NIT	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				Is your firm/company MSME registered for this item?	NA	YES or NO	YES	YES	TRUE	

Tender Inviting Authority: GM (MM) BCCL HQ
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NIT No: BCCL/PUR/715270/3D TLS/III/16-17/19
Bidder Name: MEATECH SOLUTIONS LLP

TECHNICAL PARAMETER SHEET										
S. No *	Item Code *	Description of Item *	Bidder's Eligibility Status	Specification Parameter *	Unit of Measure *	Evaluation Criteria (To be selected from drop down box in each cell) *	Required Value *	Bidder's value *	Eligibility	
									Specification wise	Overall
				Specify offered quantity:	NA	NOT NULL	NOT NULL		TRUE	
				Specify make and model:	NA	NOT NULL	NOT NULL	Regd VZ-4000	TRUE	
		<div>COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT FOR 3D LASER Scanner & ITS ASSASSORIES, Terms of Comprehensive AMC, and Downtime penalty. Applicable for all the above item No: 1, 2 & 3. (Note: Bidder quoting for any of the items must qualify for the AMC also.)</div>		1) The bidder should quote separately for three years comprehensive annual maintenance charges inclusive of repair/replacement of all parts as may be required after expiry of guarantee/warranty period.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
			a) Half-yearly preventive maintenance and calibration checking at User's premises.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			b) Any number of breakdown maintenance and calibration servicing if required in case of breakdown the user shall communicate to the supplier by telephone/FAX/e-mail giving the nature of faults faced with machine generated code, if any. The supplier should attend the equipment at user's premises at the earliest possible time not exceeding 5 days.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			c) In case the equipment needs to be taken to the service centre for breakdown maintenance or for any other reason, it shall be the responsibility of the supplier and user shall bear no financial implication in the regard.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			d) The rate of the CAMC shall be quoted in lump sum basis in Indian Rupees and not in terms of percentage of equipment cost. The rate shall have be firm throughout the three years period of AMC.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			e) The aim of the CAMC is to maintain at least 90% availability of the equipment for its satisfactory working. In case availability falls below 90%, a down time penalty on pro-rata basis will be imposed as per laid down terms and conditions given in DOWN TIME PENALTY below separately.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			f) It will be the responsibility of the supplier to contact BCCL and enter into the agreement well before expiry of the Warranty period.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			g) On the basis of requirement the equipment may be deployed at our different Areas / Collieries under administrative control of Bharat Coking Coal Ltd.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			h) Detail terms and conditions of the CAMC will be prepared on the basis of discussion & mutual agreement between user and supplier, without changing the above terms in principle.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			2) The party shall guaranty 90% availability (uptime) for the equipment for satisfactory working.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			3) The machine downtime will be reckoned only for the working days of BCCL. For example, if equipment remains under breakdown for 10 days in which 3 days are holidays then effective breakdown days will be considered as 7 days	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			4) Breakdown period in days will start from the day of reporting breakdown to the party by telephone/FAX/e mail and it is handed over to the user in working conditions.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			5) The availability percentage will be calculated for each half year i.e. six monthly. Penalty will be imposed on pro-rata basis, if the availability falls below 90%. Thus Penalty = (90% - actual availability %) X (CAMC charge)/2x90%	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			6) No bonus or additional sums shall be payable if the availability is more than 90%.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		
			7) Actual availability percentage for each equipment will be calculated as follows :- (No of working days during half year - Effective breakdown days during the half year X 100) / No of working days during Half year = Actual availability%	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE		

Tender Inviting Authority: GM (MM) BCCL HQ
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 NIT No: BCCL/PUR/715270/3D TLS/III/16-17/19

Bidder Name: MEATECH SOLUTIONS LLP

TECHNICAL PARAMETER SHEET										
S. No *	Item Code *	Description of Item *	Bidder's Eligibility Status	Specification Parameter *	Unit of Measure *	Evaluation Criteria (To be selected from drop down box in each cell) *	Required Value *	Bidder's value *	Eligibility	
									Specification wise	Overall
				8) Penalty for the half year will be calculated basis of the table below : Availability % percentage (rounded) Penalty 90% and above Nil 75 % to 90 % As per calculation mentioned above. 50% to 75 % Double the calculated amount as per rate calculation mentioned above. Below 50% No CAMC payment for that half year.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
				9) Payment terms for 'maintenance Charges (MC)'/Paying Authority : i) The half yearly MC bills (being the pro rata amount for six months of the 'Annual Maintenance Charges') along with the 'Service Report' for the preceding six months and the 'Completion Certificate' from the concerned Head of the user department (Area Survey Officer of the Area) shall be raised after the completion of each half year which will be paid by cheque after receipt and acceptance of the same. Penalty Charges for the preceding six months, if any, shall be recovered from the half yearly bill. During the 'Contract Period' no interest is payable on any amount whatsoever to the successful Bidder/Supplier if any. ii) Paying Authority: HoD (F) (Pay), BCCL, Dhanbad.	NA	AGREED or DISAGREED	AGREE	AGREE	TRUE	
***TECHNICAL PARAMETER SHEET										
***PLEASE ENTER THE DETAILS AS PER THE INFORMATION AND DOCUMENTS YOU HAVE W.R.T. YOUR OFFERED ITEM'S										
BY TENDER INVITING AUTHORITY										

Sgt

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ANNEXURE - F

FORMAT OF BANK GUARANTEE FOR SECURITY DEPOSIT

M/s. Bharat Coking Coal Ltd.

Koyla Bhawan

Koyla Nagar

Dhanbad – 826005

In consideration of M/s Bharat Coking Coal Ltd. having its office at Koyla Bhawan, Koyla Nagar, Dhanbad hereinafter called "the Purchaser" (which expression shall unless repugnant to the subject or context including its successors and assigns) having agreed under the terms and condition of Contract No. dated made between M/s a Company having its office at (hereinafter called the supplier in connection with supply of hereinafter called the "said Contract" to accept a Deed of Guarantee as herein provided for Rs. in lieu of the security deposit to be made by the supplier for their due fulfillment of the terms contained in the said Contract, we, the Bank Limited (hereinafter referred to as the said Bank having its office at do hereby undertake and agree to indemnify and keep indemnified that Purchaser from time to time the extent of Rs. (Rupees :) against any loss. Damage caused charges and expenses caused to or suffered by or that may be caused to suffered by Purchaser by reason of any breach or breaches by the said supplier or any of the terms and conditions contained in the said Contract and to unconditionally pay the amount claimed by the Purchaser on demand and without demur to the extent aforesaid.

We, the (Name of the Bank) do hereby agree that any demand made by Purchaser on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. We shall not withhold the payment on the ground that the supplier has disputed its liability to pay or has disputed the quantum of amount or that any legal proceeding is pending between the Purchaser and the Supplier regarding the claim. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs.

We, the (Name of the Bank) do further agree Guarantee herein contained shall come into force from the date hereof and shall remain in full force and effect up to Unless demand or claim under this Guarantee is made on us in writing on or before we shall be discharged of all liabilities under this Guarantee thereafter.

We, the (Name of the Bank) further agree with the Purchaser that the Purchaser, shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend the time of delivery of the specified items in the Contract from time to time or to postpone for any time or from time to time any of the powers exercisable by the Purchaser against the said supplier and to forebear or enforce any of the terms and conditions relating to the said contract we shall not be relieved from our liability by the reason or any such variations or extension being granted to the said Supplier or for any forbearance act or omission on the part of the Purchaser or any indulgence by the Purchaser to the said Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us the Bank further agrees that in case this Guarantee is required for a longer period and it is not extended by the Bank beyond the period specified above. The Bank shall pay to the Purchaser the said sum of or such lesser sum as may then be due to the Purchaser and as the Purchaser may demand.

We, the (Name of the Bank) lastly undertakes not to revoke this Guarantee during this currency except with the previous consent of the Purchaser in writing.

The Bank has under its constitution power, to give this Guarantee and Mr. Manager who has signed it on behalf of the Bank has authority to do so.

This Bank Guarantee will not be discharged due to the change in the constitution of the Bank or the Supplier.

[In case the BGs are from outstation branch of Dhanbad then BG shall be encashable at Dhanbad/Kolkata branch of issuing bank with address and location of the said branch at Dhanbad/Kolkata will be as under .

Name of the Bank :

Name of the Branch :

Location & Address :

The BG shall be subject to the jurisdiction of the competent courts at Dhanbad District only.]

The Bank guarantee issued by the Bank on behalf of the supplier in favour of Bharat Coking Coal Limited, shall be in paper form as well as issued under " Structural Financial Messaging System". The detail of beneficiary for issue of BG under SFMS mode are furnished below:

Name of Bank : State Bank of India
Branch name : Main Branch Dhanbad
A/C no. : 35160317947
IFSC Code : SBIN0000066

OR

Name of Bank : ICICI Bank
Branch name : ICICI Bank, Dhanbad
A/C no. : 019605001057
IFSC Code : ICIC0000196
Dated day of
For Bank

Signature of the authorized person
For and on behalf of the Bank
Emp. Code.



ANNEXURE - G

FORMAT OF PERFORMANCE BANK GUARANTEE

1. Messers ----- a company having Regd. Office /its office at -----
-----hereinafter called the Seller has entered into a Contract No.-----dt.-----
----- (hereinafter called the said Contract) with Bharat Coking Coal Limited having its Regd. Office (address to the
given ----- (hereinafter called , the Purchaser) to supply equipment on the terms and conditions in the said
Contract.

It has been agreed that hundred percentage(100%) payment of the value of the equipment will be made to the seller in the terms
of the said Contract on the seller furnishing to the Purchaser a Bank Guarantee for the sum of ----- equivalent to 10 % of the value
of each equipment and accessories dispatched by the seller as security for the due and faithful performance of the terms of the said contract
and against any loss or damage caused to or would be caused to or suffered by the purchaser by reason of any of the terms or conditions
contained in the said contract.

The ----- Bank having its office at ----- has at the request of seller agreed to give the guarantee herein
after contained.

2. We, ----- (Name of the Bank) do hereby undertake to pay the amounts due and payable under this guarantee without
any demur merely on a demand from the purchaser stating that the amount claimed is due by way of loss or damage caused to or would be
caused to or suffered by the purchaser by reason of any breach by the said seller of any of the terms or conditions contained in the said
contract or by reason of the seller's failure to perform the said contract. Any such demand made on the Bank shall be conclusive as regards
the amount due and payable by the Bank under this guarantee. We shall not withhold the payment on the ground that the seller has disputed
its liability to pay or has disputed the quantum of the amount or that any arbitration proceeding or legal proceeding is pending between
purchase and the seller regarding the claim. However , our liability under this guarantee shall be restricted to an amount not exceeding -----

3. We, ----- (Name of the Bank) further agree that the guarantee herein contained shall come into force from the date
hereof and shall remain in full force and effect during the period of the said contract and that it shall continue to be enforceable till all the
dues of the purchase under or by virtue of the said contract have been fully paid and its claim satisfied or purchase certified that the terms
and conditions of the said contract have been fully and properly carried out by the said seller and accordingly discharged the guarantee
Unless a demand or claim under this guarantee is made on us in writing on or before the ----- (date to be given ----- period
of contract + 90 days from the date of Bank Guarantee) we shall be discharged from all liability under this guarantee thereafter.

4. We, (Name of the Bank) further agree with the purchaser ,that the purchaser , shall have the fullest liberty without our consent and without
affecting in any manner no obligations hereunder to vary any of the terms and conditions of the said contract or to extend time of performance
by the said seller(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the purchaser ,
against the said seller and to forbear or enforce any of the terms and conditions relating to the said contract and we shall not be relived from
our liability by reason or any such variation or extension being granted to the said seller or for any forbearance act or omission on the part
of the purchaser , or any indulgence by the purchaser to the said seller by any such matter or thing whatsoever which under the law relating
to sureties would be for this provision have effect of an relieving us. The Bank further agrees that in case this guarantee is required for a
longer period and it is not extended by the bank beyond the period specified above , the bank shall pay to this purchaser the said sum of ----
----- or such lesser sum as may than be due the purchaser and as the purchaser may demand.

5. We, ----- (Name of the Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent
of the purchaser , in writing.

6. The Bank has under its constitution power to give this guarantee and Mr. ----- Manager , who has signed it on behalf of the
Bank has authority to do so.

7. This Bank Guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.

[In case the BGs are from outstation branch of Dhanbad then BG shall be encashable at Dhanbad/Kolkata branch of issuing bank with
address and location of the said branch at Dhanbad/Kolkata will be as under :

Name of the Bank :

Name of the Branch :

Location & address :

The BG shall be subject to the jurisdiction of the Civil courts Dhanbad District only.]

The Bank guarantee issued by the Bank on behalf of the supplier in favour of Bharat Coking Coal Limited, shall be in paper form as well
as issued under " Structural Financial Messaging System". The detail of beneficiary for issue of BG under SFMS mode platform are
furnished below:

Name of Bank : State Bank of India

Branch name : Main Branch Dhanbad

A/C no. : 35160317947

IFSC Code : SBIN0000066

OR

Name of Bank : ICICI Bank

Branch name : ICICI Bank, Dhanbad

A/C no. : 019605001057

IFSC Code : ICIC0000196

platform is furnished below:

Date ----- Day of ----- 20

For ----- Bank

Signature of the authorised person

for and on behalf of the Bank

Emp. Code.



Annexure-II

PRE-DESPATCH INSPECTION CLAUSE

Pre-dispatch inspection of each consignment shall be carried out by M/s. Central Mine Planning & Design Institute Ltd (CMPDIL), Ranchi/their Regional Office as per the terms and conditions indicated hereunder:

Pre-dispatch inspection shall be carried out by M/s. CMPDIL (the above firm) as per their methodology. The third Party Inspection shall include examination of raw material, test certificate verification, continuous monitoring of quality assurance by manufacturer which will include regular and surprise visits. In brief, the scope and condition of inspection by M/s.CMPDIL will be as follows :

Checking and approval of test procedures/quality assurance plans.

Verification of records and documents of your works.

Verification of documents and test certificate of bought out items and cross checks.

You shall provide facilities for carrying out all necessary tests as required in the specification at your works else these will be carried out at an independent test house at your cost.

Final testing and checking of materials as per specifications.

M/s.CMPDIL will have full and free access to the premises of manufacturer during the process of manufacturing and during inspection activities.

Inspection fee @ 1% of total consignment billing (plus statutory levies GST) etc,as applicable on inspection fee) is to be paid to M/s.CMPDIL along with inspection call letter payable by SBI Collect as per enclosed appendix-H(a) which will be reimbursed subsequently by BCCL together with consignment billing.

Minimum 7 calendar days notice shall be given by the manufacturer to M/s.CMPDIL for arranging inspection within valid delivery period as per contract.

The ultimate responsibility for supply of correct materials as per requirement of relevant specification lies solely with the manufacturer inspite of clearance/acceptance by inspection authority i.e. M/s.CMPDIL. The manufacturer will be required to replace the material free of cost if found defective/unserviceable/not according to relevant specifications.

The charges for third party inspection and the cost of materials that would be required for destructive tests, if any, shall be reimbursed by BCCL together with the consignment billing. Such cost shall be reimbursed only if it is duly certified by M/s.CMPDIL.

Please send inspection call to M/s.CMPDIL, Ranchi/ their Regional. Office as per appendix-H (b).

Final inspection shall be arranged by the consignee after receipt of the material at our destination.

The purchaser shall, at its discretion, have the right to test the ordered material in a Government Test House or in a test house nominated by the purchaser. In case of failure of the material after testing the cost of tests as well as of the material shall have to be borne by the supplier.

FOR AND ON BEHALF OF BCCL

Appendix-H(a)

The manufacturer/firm, intending to submit the Pre-Dispatch Inspection (PDI) Fees online through SB collect has to follow the following steps:-

- i. Visit CMPDI site (www.cmpdi.co.in).
- ii. Click on the link of State Bank Collect to pay Inspection Fee
- iii. Click the acceptance of terms & conditions and then click the proceed button.
- iv. Next page will open. Here you select the state as *Jharkhand* and then select the type of institution as *PSU-Public Sector Undertaking*, then press go button.
- v. Next page will open requesting to you select PSU name, here you select *CMPDI Ltd.* & then press the submit button.
- vi. Next page will open, requesting to select the payment category. Here you select "*INSPECTION FEES*".
- vii. Automatically you will be transferred to next page requesting to you to provide details of payment. Here you are required to fill the data as requested in each row including the remarks.
- viii. After filling all the required data, press the *submit* button, you will be transferred to next page, which will request to verify the details and confirm the details. Press *confirm* button if entry made are correct otherwise press cancel If you press Confirm then you will be transferred to next page where payment option will appear.
- ix. On this page you will find the various modes of e-payment of different banks i.e. net-banking, debit card, credit card etc.
- x. At this page you are requested to make the payment by selecting the appropriate mode of payments offered by different banks as per your choice.
- xi. After making the payment please take out the prints of e-receipt which should subsequently be submitted to us as a proof of payment made to CMPDI along with inspection call letter.
- Xii. The inspection call is required to be submitted online on the email id gmenm.cmpdi@coalindia.in, with a copy to paresh.saxena@coalindia.in in in the following manner:
 - a) A Covering letter on your letter head giving the details of inspection.
 - b) Inspection call duly stamped and signed, addressed to GM (E&M) CMPDI in the required format on your letter head.
 - c) Copy of e-money receipt for the PDT Fee deposited online.
 - d) Copy of the respective complete supplied order against which inspection call is raised.All the above four documents are to be submitted in separate POF files.
- Xiii. Simultaneously a copy of e-money receipt for the POI Fee deposited online must be mailed on the email id: hqfinance@yahoo.com, with a copy to Sandeep.aru@coalindia.in

Note: - The facility for submission of POI Fee on State Bank Collect will be available from 1st to 25th of every month.



Appendix-H(b)

To

The General Manager (E&M),
CMPDI Ltd.
Gondwana Place, Kanke Road
Ranchi 834031
(Ph 0651-2230876, Fax 0651-2230127)

INSPECTION CALL (To be typed in Company's Letter Head)

Name of Subsidiary Company of CIL	Inspection Call Ref No. & Date:
Manufacturer's Name with Address & Tel/Mobile phone No.:	P.O. No./R.C. No./Amendment/etc.: Date
Contact Person Details: • Tel. /Mobile Phone No.: • email id:	Status of supply order: Running Order/ New Order: (Please tick the appropriate one.)
Place of Inspection:	Brief Description of Material :
Qty. of Offered Material:	Value of Offered material: Basic Value: Consignment Value: (Including of all Taxes, packing & forwarding charges, Transit insurance, Freight etc.)
Date of readiness of Material: Proposed date of Inspection:	
1) Inspection Fee @1% of Consignment Value : Rs.....	Details of e-receipt payment generated after paying the inspection Fee on SB collect:
2) GST as applicable on the date of submission of PDI Fee: Total (1+2):	1. e-receipt no.: 2. Date:..... 3. Amount in
Note: 1. Inspection fee and service charges is being sent on email id: gmenm.cmpdi@coalindia.in , with a copy to paresh.saxena@coalindia.in 2. Copy of Purchase order to be enclosed with inspection call.	

Signature with seal

3D Very Long Range Terrestrial Laser Scanner with Online Waveform Processing

RIEGL VZ-4000

- very long range up to 4,000 m
- eye safe operation at Laser Class 1
- wide field of view, 60° x 360°
- high speed data acquisition up to 222,000 meas. / second
- high accuracy, high precision ranging based on echo digitization and online waveform processing
- multiple target capability - unlimited number of targets
- optional waveform data output
- built-in calibrated digital camera
- on-board inclination sensors
- Integrated L1 GPS receiver with antenna
- Integrated compass
- built-in SSD drive storage
- compact and rugged design
- advanced camera options

This 3D VZ-Line Laser Scanner offers superior and unrivaled long range measurement performance up to 4,000 m reflectorlessly while still maintaining completely eye safe operation (Laser Class 1).

RIEGL's unique V-Line technology is based on echo digitization and online waveform processing and is the key to enabling such extreme long range measurements. The VZ-4000 operates even in poor visibility and demanding multi target situations caused by dust, haze, rain, snow, etc. which are frequently found in difficult environments such as mine sites.

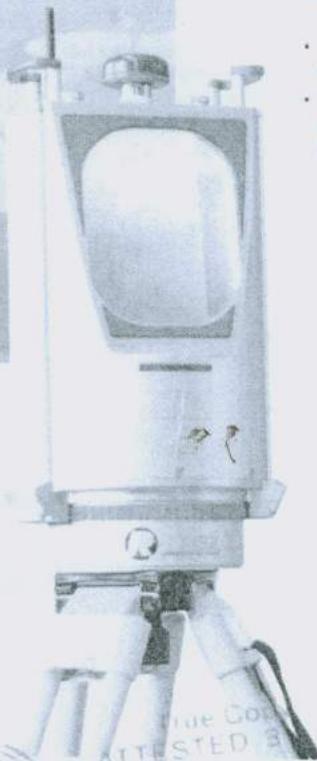
Modes of Operation:

- stand-alone operation with integrated graphical user interface via 7" touchscreen
- remote control VNC Viewer with any standard tablet PC or mobile device via WiFi
- remote operation with RISCAN PRO on a notebook via LAN or WiFi connection
- customized operation by third party tools / applications based on RIEGL's well documented interfaces and scanner libraries (e.g., RVLlib)

Typical applications include

- Topography & Mining
- Long Range Monitoring
- Civil Engineering
- Archaeology

visit our website
www.riegl.com



RIEGL
LASER MEASUREMENT SYSTEMS



22 JUL 2016



VZ-4000 Key Features and Components



Extremely Long Range Performance

The High-Speed, High-Resolution 3D Laser Scanner RIEGL VZ-4000 offers an extremely long range of more than 4,000 m and a wide field of view of 60° vertical and 360° horizontal. It uses an invisible laser beam for eye safe operation in Laser Class 1.

The high accuracy and reliability of range measurement performance is based on RIEGL's unique V-Line technology of echo digitization and online waveform processing. Extreme long range measurements can be achieved even with poor visibility and demanding multi target situations caused by dust, haze, rain, snow, etc.

Built-in Camera

A built-in calibrated 5-Megapixel camera capturing images deflected by the laser mirror enables coverage of the entire field of view with an appropriate number of high resolution images automatically stitched together to create a high resolution panorama image. This panorama image, in combination with precise 3D measurements produced by the VZ-4000, enables the creation of photorealistic virtual models for geological and geotechnical investigations, avalanche research, geomorphology, and geological features.

Waveform Data Output Option

The digitized echo signals, also known as waveform data, acquired by the RIEGL VZ-4000 are the basis for waveform analysis. This data is provided via the optionally available waveform data output and accessible with the associated RIEGL software library RIVAELib for investigations and research on multi target situations based on the digital waveform data samples of the target echoes.

Compatible Software Packages

The RIEGL VZ-4000 is compatible with the RIEGL software package RISCAN-Pro for terrestrial laser scanning, RIEGL's interface library RIVLib, as well as the workflow-optimizing software packages, e.g. RIMINIO. The optional software plugin RIMTA-TLS provides automatic assignment of the scan data to the correct MTA zone in multiple time around situations.

Supported Registration Methods

Direct Geo-Referencing

- integrated GPS receiver (L1) connected
- external high-end RTK-GNSS receiver connected
- integrated compass; accuracy typ. 1° (one sigma value; available for vertical scanner setup position)
- on-board inclination sensors (tilt range $\pm 10^\circ$; accuracy typ. $\pm 0.008^\circ$)

GNSS Traversing

- GNSS position (RTK or autonomous)
- on-board inclination sensors
- automatic acquisition of well known remote target (reflector)

Free Stationing

- fast fine scanning of reflectors for precise determination of scanner position using control points

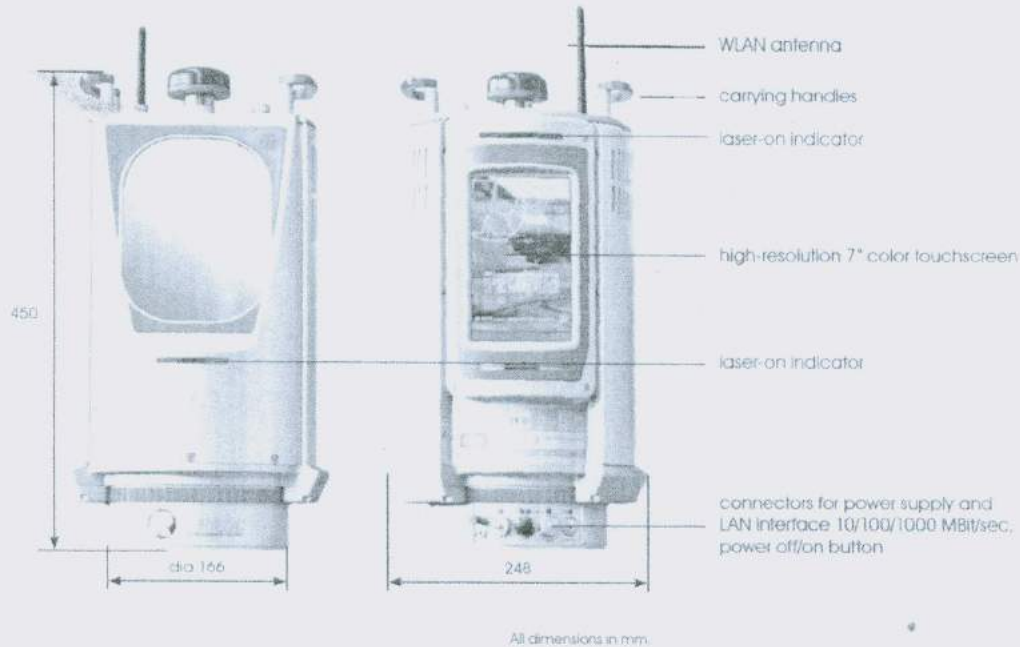
Backsighting

- setup on well known point
- on-board inclination sensors
- precise fine scanning of well known remote target (reflector)



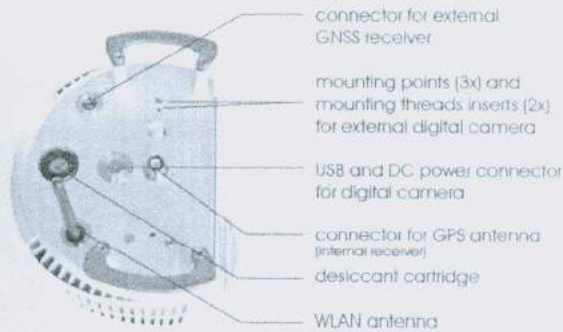
Handwritten notes and stamps are visible on the page. A large circular stamp reads "RIEGL VZ-4000". A date stamp reads "22 JUL 2016". There are several handwritten signatures and initials, including "Sinc" and "ba".

Operating Elements and Connectors RIEGL VZ[®]-4000



Communication and Interfaces

- LAN port 10/100/1000 MBit/sec within base
- integrated WLAN interface with high-gain antenna
- USB 2.0 for connecting an external digital camera
- connector for GPS antenna
- two external power supply ports
- connector for external GPS synchronization pulse (1PPS)
- connector for external GNSS receiver



Scan Data Storage

- internal 80 GBytes SSD (Solid State Disc) (2 GBytes reserved for the operating system)
- external storage devices (USB flash drives or external hard drives) via USB 2.0 interface



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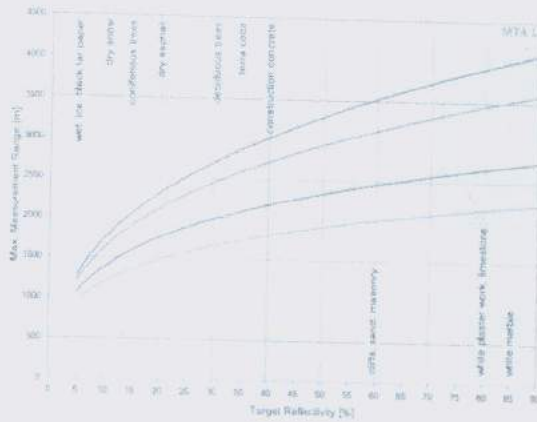


22 JUL 2016

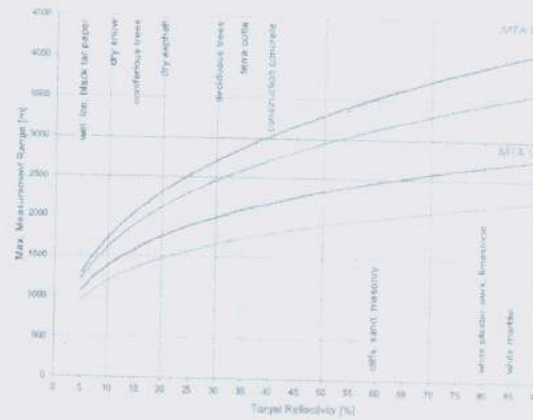
Max. Measurement Range RIEGL VZ®-4000

■	standard clear atmosphere: visibility 23 km
■	clear atmosphere: visibility 15 km
■	light haze: visibility 8 km
■	medium haze: visibility 5 km

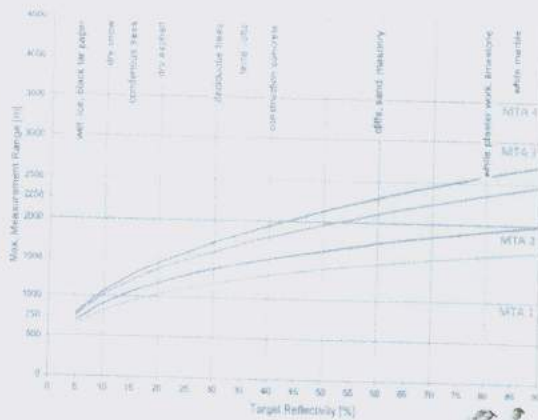
30 kHz PRR



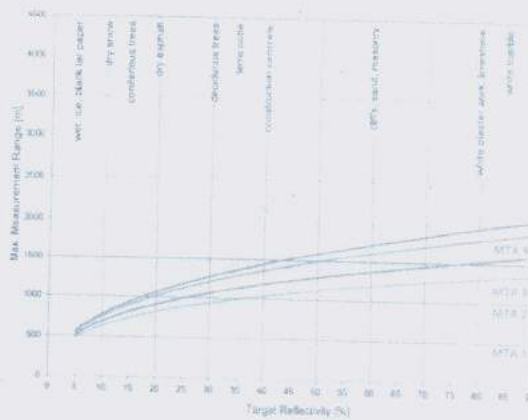
50 kHz PRR



150 kHz PRR



300 kHz PRR



The following conditions are assumed:

- flat target larger than footprint of the laser beam
- perpendicular angle of incidence
- average brightness
- ambiguity resolved by post processing with RIMTALS

MTA zones:

- MTA 1: no ambiguity, 1 pulse „in the air“
- MTA 2: 2 pulses „in the air“
- MTA 3: 3 pulses „in the air“
- MTA 4: 4 pulses „in the air“



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[Date: 28/07]
[Location: PRAHA]



User-Friendly and Efficient Operation and Acquisition Workflow

Operation is easy with the integrated graphical user interface via 7" touchscreen, or by remote control of the scanner via VNC Viewer with any tablet PC or mobile device via WiFi connection.

Highly efficient scan data acquisition and global registration is supported by on-board inclination sensors, integrated L1 GPS receiver, an interface

for a high-end external GNSS receiver on top of the scanner, a digital compass and built-in SSD data storage media. With a visual project overview of acquired scan data, it is possible to ensure complete data coverage or check the progress of a project as it is acquired. The system provides a number of useful features that help to make the user experience better overall. One of these features is the ability to schedule scans to be acquired fully automatically on a regularly defined time interval which is useful for

capturing 4D (3D time-lapse) datasets without direct user supervision of the system.



Power Supply

- intelligent power supply management, up to three independent external power sources can be connected simultaneously for uninterrupted operation
- reliable under- and over voltage protection
- wide external voltage supply range 11-32 V DC
- power consumption typ. 75 W (max. 90W)
- LED indicators for power status

Camera Capabilities

Advanced Camera Support Capability

The VZ-Line of scanners has been updated with advanced camera support capability. Utilizing a specialized interface and a universal mount system, RIEGL is able to provide support for a wide variety of industrial cameras in standalone operation. This development enables the VZ-4000 to **directly control, operate and acquire images from RGB, Thermal, Industrial and a number of other camera systems and types** without complex cabling, connections or the need of an external laptop. With simplified mount integrations, it is now possible to acquire advanced images from state-of-the-art camera technologies simply using RIEGL Terrestrial Laser Scanners.



Technical Data RIEGL VZ[®]-4000

Laser Product Classification

Class 1 Laser Product according to IEC60825-1:2007
The following values apply for instruments delivered into the United States:
Complies with 21 CFR 1040.10 and 1040.11, except for deviations pursuant
to Laser Notice No. 52, dated June 24, 2007



Range Measurement Performance ¹⁾

Measuring Principle

time of flight measurement, echo signal digitization,
online full waveform analysis, multiple-time-around processing,
full waveform export capability (optional)
single pulse ranging

Mode of operation

Laser Pulse Repetition Rate (PRR) (peak) ²⁾	30 kHz	50 kHz	150 kHz	300 kHz
Effective Measurement Rate (meas./sec) ³⁾	23,000	37,000	113,000	222,000
Max. Measurement Range ³⁾				
natural targets $\rho \geq 90\%$	4,000 m	4,000 m ⁴⁾	2,700 m ⁴⁾	2,000 m ⁴⁾
natural targets $\rho \geq 20\%$	2,300 m	2,300 m ⁴⁾	1,450 m ⁴⁾	1,000 m ⁴⁾
Max. Number of Targets per Pulse	practically unlimited ⁵⁾			

Accuracy ^{5a)}

15 mm

Precision ^{5b)}

10 mm

Minimum Range

5 m

Laser Wavelength

near infrared

Laser Beam Divergence

0.15 mrad

Laser Beam Footprint (Gaussian Beam Definition)

18 mm @ exit, 75 mm @ 500 m, 150 mm @ 1000 m, 300 mm @ 2000 m

- 1) With online waveform processing
- 2) Rounded values, selectable by measurement program
- 3) Typical values for average conditions. Maximum range is specified for flat targets with $\rho \geq 90\%$ in excess of the laser beam diameter, perpendicular angle of incidence and for atmospheric visibility of 23 km. In bright sunlight, the max. range is shorter than under overcast sky.
- 4) Ambiguity to be resolved by post-processing with RMTA TLS
- 5) Details on request
- 6) Accuracy is the degree of conformity of a measured quantity to its actual (true) value
- 7) Precision, also called reproducibility or repeatability, is the degree to which further measurements under the same result
- 8) One sigma (σ), 150 m range under IEC60825-1 conditions
- 9) Measured at the 10% points, 0.15 mrad corresponds to an increase of 15 mm of beam diameter per 100 m of range

Scanner Performance

Scanning Mechanism

Vertical (line) Scan

lightweight mirror

rotating / oscillating

total 60° (+30° / -30°)

100°/sec to 14400°/sec (1/20 rotations/sec), full FCV

0.002° $\leq \Delta \theta \leq 0.280°$ ¹⁾

between consecutive laser shots

better 0.0005° (1.8 arcsec)

integrated, for vertical scanner setup position, details see page 2

integrated, 1:1, with antenna

integrated, for vertical scanner setup position, details see page 2

integrated

integrated, for real-time synchronized time stamping of scan data

scanner rotation synchronization

providing digitized echo signal information for specific target echoes

Horizontal (Frame) Scan

rotating head

max. 360°

0°/sec to 60°/sec ¹⁾

0.002° $\leq \Delta \phi \leq 3°$ ¹⁾

between consecutive scan lines

better 0.0005° (1.8 arcsec)

Angle Measurement Resolution

Inclination Sensors

GPS Receiver

Compass

Laser Plummet

Internal Sync. Timer

Scan Sync (optional)

Waveform Data Output (optional)

10) Frame scan can be disabled, providing 2D scanner operation

11) Selectable

General Technical Data

Power Supply Input Voltage / Power Consumption

11 - 32 V DC / typ. 75 W (max. 90 W)

External Power Supply

up to 3 independent external power sources can be connected

simultaneously for uninterrupted operation

248 x 226 x 450 mm (length x width x height, approx. 14.5 kg)

max. 80 % non-condensing @ +31°C / IP64, dust- and splash-proof

Main Dimensions / Weight

Humidity / Protection Class

Temperature Range

Storage / Operation

Low Temperature Operation ^{7a)}

-10°C up to +50°C / 0°C up to +40°C (standard operation)

-20°C: continuous scanning operation if instrument is powered on

while internal temperature is at or above 0°C and still air

Integrated Digital Camera

field of view 7.2 x 5.5° (v x h)

resolution 2560 x 1920 pixels (5 Mpixel)

Display

7" WVGA (800 x 480) color

capacitive touchscreen, full operation control for stand-alone usage

12) Insulating the scanner with appropriate material will enable operation at even lower temperatures



RIEGL Laser Measurement Systems GmbH
Riedingergraben 18
31120 Rinteln, Austria
Phone: +43 2922 4031 Fax: +43 2922 4032
E-Mail: info@riegl.at

True Copy

ATTESTED BY ME

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RIEGL VZ-2000[®]

- very long range
up to more than 2,000 m
- very high effective measurement
rate up to 400,000 meas./sec
- eye safe operation in Laser Class 1
- wide field of view, 100° x 360°
- fully customizable scan parameters
(field of view, laser pulse repetition
rate PRR, measurement rate)
- ideal for use within the RIEGL
VMZ Hybrid Mobile Laser Mapping
System
- high accuracy, high precision
ranging based on echo digitization
and online waveform processing
- multiple target capability -
unlimited number of targets
- high-precision mount
for optional digital camera
- on-board inclination sensors
- integrated L1 GPS
receiver with antenna
- interface for external
GNSS receiver
- integrated compass
and laser plummet
- various interfaces
(LAN, WLAN, USB 2.0)
- internal data
storage

The V-Line[®] 3D Laser Scanner RIEGL VZ-2000 is characterized by an extremely high effective measurement rate offering high accuracy data acquisition up to 400,000 measurements/sec and up to 240 scan lines/sec. The scanner further offers exceptional long range measurement performance of more than 2000 m to natural surfaces while still maintaining completely eye safe operation (Laser Class 1).

RIEGL's unique V-Line technology, based on echo digitization, online waveform processing, and multiple-time-around processing is the key to enabling such high speed, long range, high accuracy measurements even in poor visibility and demanding multi target situations caused by dust, haze, rain, snow, etc

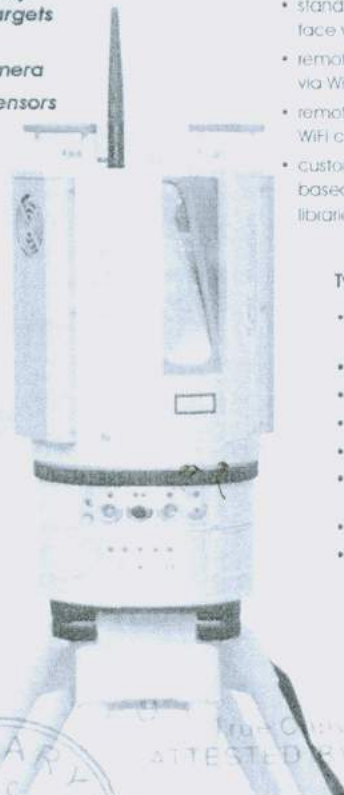
Modes of Operation:

- stand-alone operation with integrated graphical user interface via 3.5" TFT color display
- remote control with any standard tablet PC or mobile device via WiFi and Web-Browser
- remote operation with RISCAN PRO on a notebook via LAN or WiFi connection
- customized operation by third party tools / applications based on RIEGL's well documented interfaces and scanner libraries (e.g., RVLib)

Typical applications include

- Stand-alone Static and (within RIEGL VMZ)
Mobile Laser Scanning
- Open-Pit Mining
- Measurement of Bulk Material
- Civil Engineering
- City Modeling
- Mapping of Construction Sites and Construction-Site Monitoring
- Surveillance
- Archaeology

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VZ-2000 Key Features and Components

High Speed Performance

The High-Speed 3D Laser Scanner *RIEGL VZ-2000* provides state-of-the-art laser technology offering Laser PRR up to 950 kHz. *RIEGL*'s unique MIA processing software enables exploiting the full scanner's capability resulting in an effective measurement rate up to 400,000 measurements per second. Additionally the scanner offers an excellent maximum range of more than 2,000 m, a wide field of view of 100° vertical and 360° horizontal, and uses an invisible laser beam for eye safe operation in Laser Class 1.

Camera Option

A high-precision mount enables the integration of an optional DSLR camera. The camera can be easily integrated into the mount by means of two screws. Precise position and orientation of the camera is enabled by three supporting points. Power supply and a USB 2.0 interface are provided via the scanner directly.

The combination of scanner, software, and camera results in photorealistic 3D data, exact identification of details, position and distance measurements, as well as recreation of any virtual point of view. For mobile scanning application within a *RIEGL VMZ System*, the additional functionality for triggering and exact GPS synchronization is supported.



Waveform Data Output Option

The digitized echo signals, also known as waveform data, acquired by the *RIEGL VZ-2000* are the basis for waveform analysis. This data is provided via the optionally available waveform data output and accessible with the associated *RIEGL* software library *RIWAVELib* for investigations and research on multi-target situations based on the digital waveform data samples of the target echoes.



Compatible Software Packages

The *RIEGL VZ-2000* is compatible with the *RIEGL* software package *TrSCAN PRO* for terrestrial laser scanning, *RIEGL*'s interface library *RIWLib*, as well as the workflow-optimizing software packages, e.g. *RIMINING*. The optional software plugin *RIMIA TLS* provides automatic assignment of the scan data to the correct MTA zone in multiple time around situations. Combined with the one touch workflow of the scanner, *RIEGL*'s ultimate 3D scene capture solution, *RI SOLVE*, enables fully automatic registration and colorization of scan data.

For mobile laser scanning applications within a *RIEGL VMZ System* the *RIEGL* software packages *RIACQUIRE*, *RIPROCESS*, *RIPRECISION*, and *RIWORLD*, provide a seamless workflow for data acquisition and processing.

Supported Registration Methods

Direct Geo-Referencing

- integrated GPS receiver (L1) connected
- external high-end RTK GNSS receiver connected
- integrated compass (accuracy typ. 1°)
(one sigma value, available for vertical scanner setup position)
- on-board inclination sensors (tilt range $\pm 10^\circ$; accuracy typ. $\pm 0.008^\circ$)

GNSS Traversing

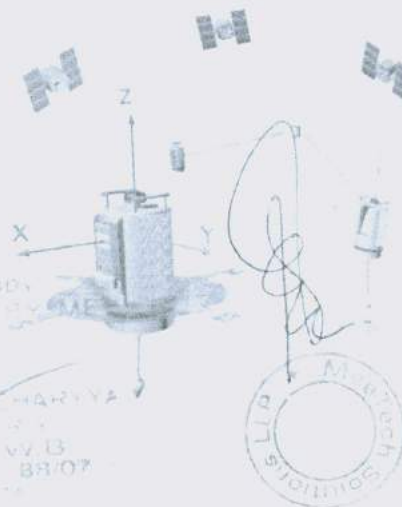
- GNSS position (RTK or float, nominal)
- on-board inclination sensors
- automatic acquisition of well known remote target (reflector)

Free Stationing

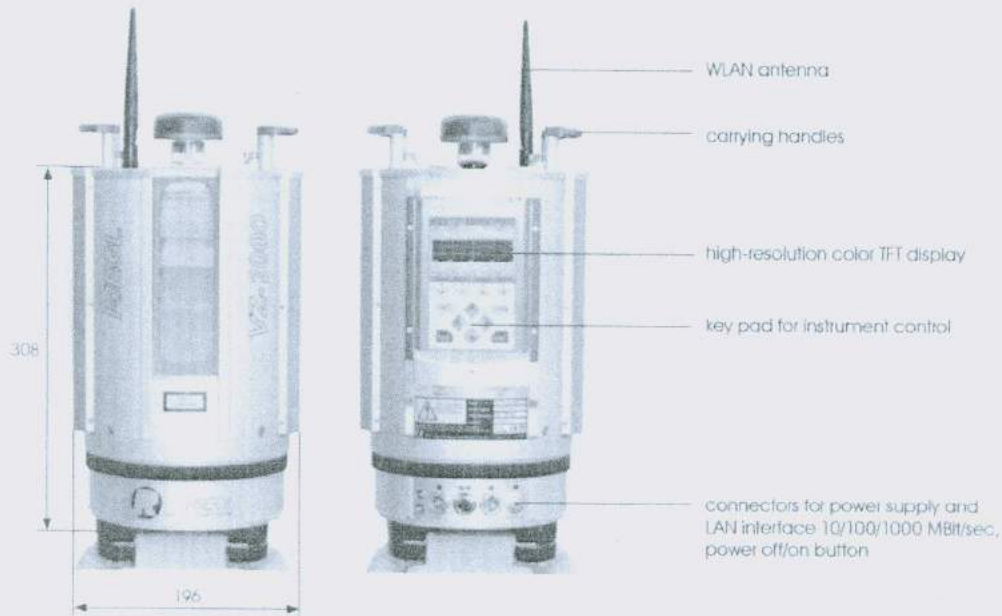
- fast fine scanning of reflectors for precise determination of scanner position using control points

Backsighting

- setup on well known point
- on-board inclination sensors
- precise fine scanning of well known remote target (reflector)



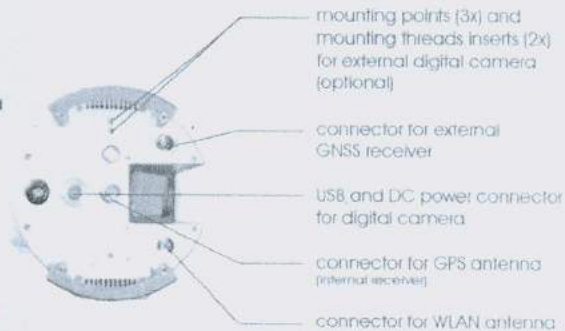
Operating Elements and Connectors *RIEGL VZ®-2000*



All dimensions in mm

Communication and Interfaces

- LAN port 10/100/1000 Mbit/sec within rotating head
- LAN port 10/100 Mbit/sec within base
- integrated WLAN interface with rod antenna
- USB 2.0 for external storage devices (USB flash drives, external HDD)
- USB 2.0 for connecting the optional digital camera
- connector for GPS antenna
- two ports for external power supply
- connector for external GPS synchronization pulse (1PPS)
- connector for external GNSS receiver
- connector for optional add-on battery



Scan Data Storage

- internal 64 GBytes flash memory (2 GBytes reserved for the operating system)
- external storage devices (USB flash drives or external hard drives) via USB 2.0 interface

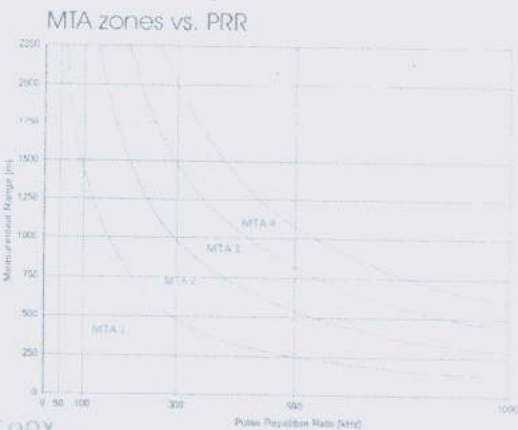
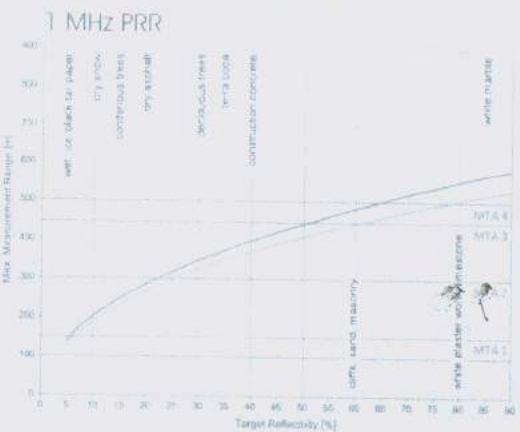
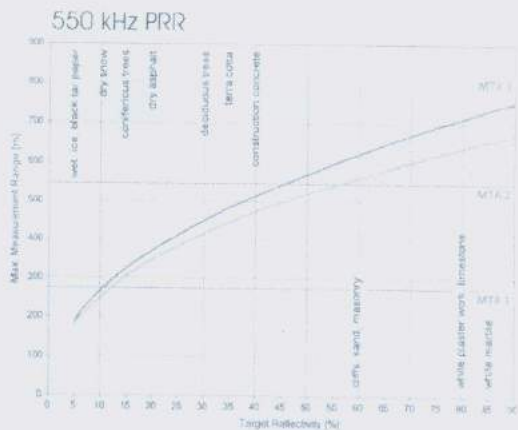
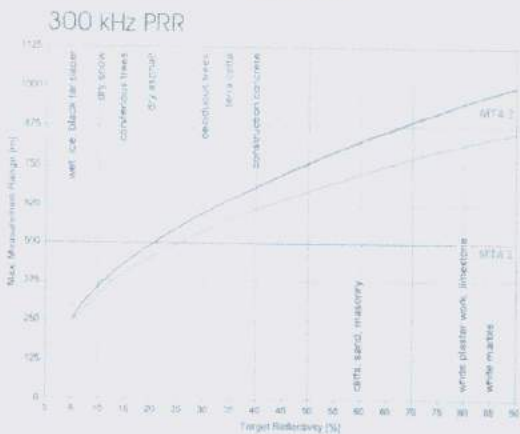
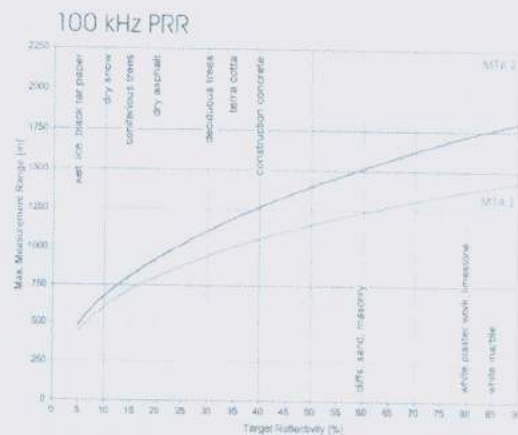
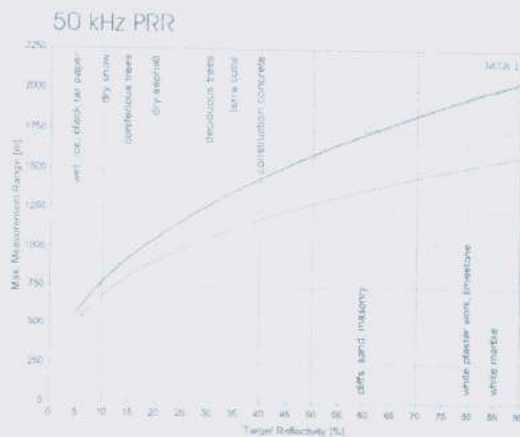


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RIEGL VZ[®]-2000 Max. Measurement Range vs. Target Reflectivity



The following conditions are assumed:

- flat target larger than footprint of the laser beam
- perpendicular angle of incidence
- average brightness
- ambiguity resolved by post processing with RIM-TLS

MTA zones:

- no ambiguity | 1 pulse „in the air“
- 2 pulses „in the air“
- 3 pulses „in the air“
- 4 pulses „in the air“

- standard clear atmosphere visibility 25 km
- light haze visibility 5 km

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VZ[®]-2000 Key Features and Components

User-Friendly and Efficient Operation and Acquisition Workflow

Operation is easy with the integrated graphical user interface via 3.5" TFT color display, or by remote control of the scanner via WIFI connection and Web Browser with any tablet/ PC or mobile device via WIFI connection. Highly efficient scan data acquisition and global registration is supported by on-board inclination sensors, integrated LI GPS receiver, an interface for a high-end external GNSS receiver on top of the scanner, a digital compass, and internal data storage. With a visual project overview of acquired scan data, it is possible to ensure complete data coverage or check the progress of a project as it is acquired. The system provides a number of useful features that help to make the user experience better overall. One of these features is the ability to schedule scans to be acquired fully automatically on a regularly defined time interval which is useful for capturing 4D (3D time-lapse) datasets without direct supervision of the system.



Power Supply

- intelligent power supply management, up to three independent external power sources can be connected simultaneously for uninterrupted operation
- reliable under- and over voltage protection
- wide external voltage supply range: 11-32 V DC
- power consumption typ. 85 W (max. 110 W)
- LED indicators for power status
- optional add-on rechargeable battery pack (high power, high capacity NiMH cells)



Mobile Scanning with the RIEGL VMZ Hybrid Mobile Mapping System

RIEGL VMZ Hybrid Mobile Mapping System

The RIEGL VZ-2000 3D Terrestrial Laser Scanner provides an extremely high measurement rate and a fast scanning mechanism. Thus, it is excellently suited for integration with the RIEGL VMZ System for combined static and kinematic data acquisition resulting in lower mobilization costs with a high return on investment. A fully integrated IMU/GNSS unit supports the scanner for kinematic data acquisition.

Fast transition from tripod to mobile mount without the necessity of bore-sight calibration is realized by use of an adapter plate mounted to the scanner. Mobile mounts for vertical or horizontal position offer flexible setup and easy mounting on the frame based roof mount which is compatible with standard roof bars.

By applying different scanning modes data acquisition can be arranged according to the requirements of each application.



From VZ to VMZ
flexible setup
and easy mounting,
e.g., in vertical position



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Technical Data RIEGL VZ®-2000

Laser Product Classification

Class 1 Laser Product according to IEC 60825-1:2007

The following clause applies for instruments delivered into the United States:
Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant
to Laser Notice No. 50, dated June 24, 2007



Range Measurement Performance¹⁾

Measuring Principle

time of flight measurement, echo signal digitization,
online full waveform analysis, multiple-time-around processing,
full waveform export capability (optional, up to 300 kHz PRF),
single pulse ranging

Mode of operation

Laser Pulse Repetition Rate PRR (peak) ²⁾	50 kHz	100 kHz	300 kHz	550 kHz	1 MHz
Effective Measurement Rate (meas./sec.) ²⁾	21,000	42,000	122,000	230,000	396,000
Max. Measurement Range ³⁾					
natural targets $p \geq 90\%$	2,050 m	1,800 m ⁴⁾	1,000 m ⁴⁾	750 m ⁴⁾	580 m ⁴⁾
natural targets $p \geq 20\%$	1,050 m	930 m ⁴⁾	500 m ⁴⁾	370 m ⁴⁾	280 m ⁴⁾
Max. Number of Targets per Pulse	practically unlimited ⁵⁾				

Accuracy⁶⁾

8 mm

Precision⁷⁾

5 mm

Minimum Range

2.5 m

Laser Wavelength

near infrared

Laser Beam Divergence

0.3 mrad⁸⁾

- 1) With online waveform processing
- 2) Rounded values, selectable by measurement program
- 3) Typical values for average conditions. Maximum range is specified for flat targets with size in excess of the laser beam diameter, perpendicular angle of incidence and for atmospheric visibility of 25 km. In bright sunlight, the max. range is shorter than under overcast sky.

- 4) Ambiguity to be resolved by post-processing with SMTA TL3
- 5) Details on request
- 6) Accuracy is the degree of conformity of a measured quantity to its actual (true) value
- 7) Precision, also called reproducibility or repeatability, is the degree to which further measurements show the same result
- 8) One sigma (σ) 150 m range under IEC test conditions
- 9) Measured at the 1 σ points 0.3 mrad corresponds to an increase of 30 mm of beam diameter per 100 m of range

Scanner Performance

Scanning Mechanism

Vertical (Line) Scan

Field of View (selectable)

rotating multi-facet mirror

Scan Speed (selectable)

total 100° (+60° / -40°)

Angular Step Width $\Delta \theta$ (vertical), $\Delta \phi$ (horizontal)

3 lines/sec to 240 lines/sec

0.0015° $\leq \Delta \theta < 1.15^\circ$ ¹¹⁾

between consecutive laser shots

better 0.0015° (5.4 arcsec)

integrated, for vertical scanner setup position, details see page 2

integrated, (1), with antenna

integrated, for vertical scanner setup position, details see page 2

integrated

integrated, for real-time synchronized time stamping of scan data

scanner rotation synchronization

providing digitized echo signal information for specific target echoes¹²⁾

Horizontal (Frame) Scan:

rotating head

max. 360°

0°/sec to 150°/sec¹⁰⁾

0.0024° $\leq \Delta \phi \leq 0.62^\circ$ ¹¹⁾

between consecutive scan lines

better 0.0005° (1.8 arcsec)

Angle Measurement Resolution

Inclination Sensors

GPS Receiver

Compass

Laser Plumbet

Internal Sync. Timer

Scan Sync. (optional)

Waveform Data Output (optional)

10) Frame scan can be disabled, providing 2D scanner operation.

11) Selectable, minimum stepwidth increasing to 0.014° @ 50 kHz PRF

12) up to a max. PRF of 300 kHz

General Technical Data

Power Supply Input Voltage / Power Consumption

11 - 32 V DC / typ. 85 W (max. 110 W)

External Power Supply

up to 3 independent external power sources can be connected

simultaneously for uninterrupted operation

196 x 203 x 308 mm, approx. 9.9 kg

max. 80 % non-condensing @ +31°C / IP64, dust- and splash-proof

Main Dimensions / Weight

Humidity / Protection Class

Temperature Range

Storage / Operation

Low Temperature Operation¹³⁾

-10°C up to +50°C / 0°C up to +40°C (standard operation)

-20°C continuous scanning operation if instrument is powered on

while internal temperature is at or above 0°C and still air

-40°C scanning operation for about 20 minutes if instrument is powered on

while internal temperature is at or above 15°C and still air

13) Insulating the scanner with appropriate material will enable operation at even lower temperatures.



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Operating & Processing Software

RiSCAN PRO

for RIEGL 3D Laser Scanners

Key Features:

- scanner control
- data acquisition
- scan registration
- georeferencing
- advanced filtering
- data import/export
- 3D visualization
- 4D animations
- simple meshing
- volume calculation

RiSCAN PRO is RIEGL's solution for processing VZ-Line Terrestrial Laser Scanner data. With advanced features for point cloud optimization, such as batch registration, 3D bundle adjustment, intelligent filtering tools, data merging and high-performance 3D visualization capabilities, RiSCAN PRO provides a fully integrated solution for producing accurate and refined TLS point cloud data.

With tools designed to optimize the acquisition workflow in the field, RiSCAN PRO provides the ability to perform real-time QA/QC of data coverage and scan registration in the field. Data is streamed in real-time from the scanner to the software, where all processing features required to produce a perfect Point cloud are provided.

RiSCAN PRO integrates sensor fusion and the transformation capabilities necessary to turn the data from multiple sensors into a seamless, colorized point cloud with a number of valuable attributes. These data can then be exported in a number of widely supported point cloud formats for further analysis and information extraction in software solutions tailored to each application.



Typical applications include

- Topography & Mining
- Civil Engineering
- Archaeology & Cultural Heritage
- City Modeling
- Agriculture & Forestry
- Measurement of Bulk Materials
- Mapping of Construction Sites and Construction-Site Monitoring
- As-Built Surveying
- Architecture & Facade Measurements



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RISCAN PRO General Information

► 64-Bit Architecture

For 64-bit operating systems RISCAN PRO 2.0 increases the usable RAM to practically unlimited for additional processing power. It visualizes more points in 3D, and polydata files with more than 250 million points are supported.

► Enhanced Graphics

With the integration of the new RDB 2.0 point format, visualization is dramatically improved. Using Level of Detail (LOD) capabilities and dedicated graphics card capabilities. Scans are loaded in real-time. The result is low rendering latency and near-instant toggling of view types.

► Power Tools

Registration of any number of scans only takes a few mouseclicks. Filtering, colorizing and many other tasks are accomplished with minimal user interaction. The new pose gizmo makes manual manipulation of scans intuitive.

► New Interface

RISCAN PRO 2.0 supports Ultra High Definition (UHD) displays and provides a simplified interface with re-sizeable icons. Additionally, icons used for 3D visualization and processing are now located within the 3D window.

► Georeferencing

The seamless integration of GeoSysManager 2.0 realizes full georeferencing support with simplified import of parameters via integrated access to the online EPSG database.

► Advanced Filtering

Point clouds can now be filtered by all attributes and the resulting carbon copies retain all the original data. Combined with the new RDB 2.0 Database, advanced filtering is easy.

► Main Functions

ACQUIRE

VZ-Line scanner control
fully customizable parameters

- field of view
- scan resolution
- pulse rate
- image overlap

Configuration of external
cameras

Scan and image data
acquisition in real-time

Real-time data transfer

Real-time 2D preview

Real-time data conversion

Instant target selection

Target acquisition

VIEW

NEW!

Large dataset support

NEW!

LoD (Level of Detail) support
2D, 3D, and panorama views

View by attribute:

- amplitude
- reflectance
- deviation
- range
- true color
- echo

Additional view types

- height
- distance to surface

3D & 4D animations

3D ortho plots



The design of RISCAN PRO's project structure enables smooth data transfer to numerous third party post-processing packages. The XML-based project file structure is published and well-documented thus enabling open access to all project information in an easy way. By using the optional RISCANLib or RIVLib library all scan data can be accessed also in a convenient way. For detailed information see RISCAN PRO's online help manual.

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PROCESS

Data adjustment

- MSA bundle adjustment
- image adjustment
- camera mounting
- camera model
- point cloud colorization

Project georeferencing

- GeoSysManager 2
- EPSG online DB
- custom CRS
- engineering CRS

Filtering

- terrain
- rain
- ghosting
- octree
- by plane
- by surface

Scan position registration

- direct georeference
- backsight
- traverse
- freestation
- 3 point solution
- 2 point resection
- 1 point reference

ANALYZE

Meshing

- smooth
- decimate
- texture

Volume calculation

- mesh to point cloud
- mesh to mesh
- mesh to surface
- mesh to plane
- point cloud to plane
- cut & fill

Surface comparison

- mesh to point cloud
- mesh to mesh

Polyline creation

Breakline tool

Contour lines

Sections

Sphere fitting

Plane fitting

EXCHANGE

Export formats:

- .csv ASCII
- .las 1.1-1.3 LAS
- .e57 (w/ Reg & Imgs)
- .pod PointTools
- .dxf Autocad
- .dm Datamine
- .obj
- .pts
- .rx RIALITY
- .tif, .jpg, .bmp 2D Plot

Import formats:

- .rxp VZ-Scanners
- .rdb RIEGL Database
- .sdw RIEGL ALS
- .3dd Z-Scanners
- .csv ASCII
- .las 1.1-1.3 LAS
- .dxf Autocad
- .vtp Polydata
- .obj
- .stl Stereolithography
- .tif, .jpg, .images

Licenses

RISCAN PRO is to be licensed on three different levels:

Basic visualization and viewing functions

All necessary functions for data acquisition, global registration, visualization and pointcloud processing

Pointcloud processing functions as well as advanced meshing, texturing, evaluation and exploring functions.



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System Requirements

Operating System:

Windows XP Professional, Windows 7 Professional 32 or 64-bit,
Windows 8 or 8.1 32 or 64-bit, Windows 10 32 or 64-bit

RAM:

Minimum: 2GB
Recommended: 16GB

Hard Drive:

Minimum: 150GB drive with 100GB free space
Recommended: 500GB solid state drive with 300GB free space

Graphics:

Minimum: OpenGL accelerated graphics support
Recommended: nVIDIA GeForce Series discrete graphics card

Interface for Scanner:

TCP/IP connectivity via 1000Gbit Ethernet port or WiFi
(2.4 or 5. GHz w/ WPA)

Download Information

To download RISCAN PRO, please navigate to <http://www.riegl.com>
and click on „DOWNLOADS“.

(Download after email registration only.)



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RIMINING

- workflow automation
- automatic data registration
- advanced filtering algorithms
- feature extraction
(contours, profiles, breaklines)
- volume calculation, surface comparison
- support for many mining software exchange formats
- full compatibility with RISCAN PRO

RIEGL VZ-xxx field-data import and registration without any targets speeds up field-surveying tremendously. Automatic Registration is accomplished utilizing state-of-the-art alignment algorithms in combination with *RIEGL* VZ-xxx built-in sensors (GPS, compass, inclination sensors). Advanced filtering algorithms enable automatic elimination of vegetation, objects and outliers. Typical mining post-processing tasks like breakline detection and volume calculation are fully supported. The extracted information can also be utilized by mine planning software because of RIMINING's support for various mining exchange formats.

- Surveying of open-pit mines, quarries and dump sites
- Change detection of excavated areas
- Fillgrade and mass calculation
- Extraction of input data for site modeling



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RIMINING Data Processing & Analysis

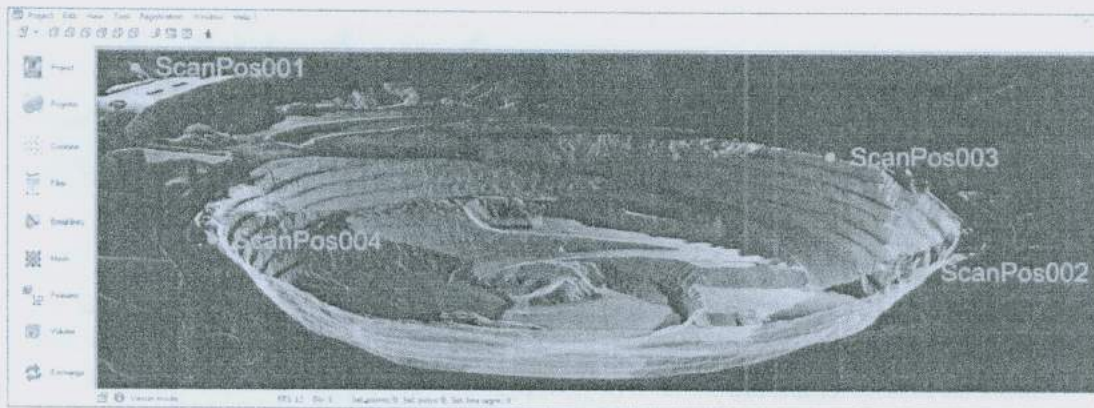
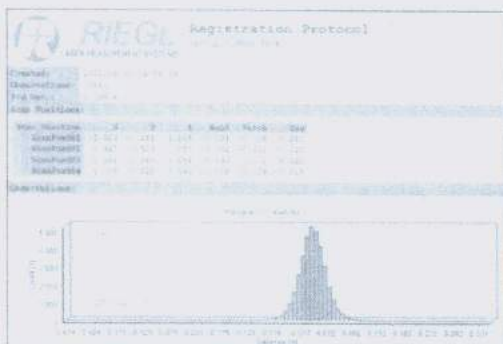


Fig.1 Sample of an open pit mine scanned with a **RIEGL VZ-1000** and automatically registered in **RIMINING**



NEW A³ Automatic Scan Alignment Algorithm

Tie objects are extracted from the acquired scan data automatically. This information is used to register the scan positions without the use of any artificial target, which reduces the on site time significantly.



Fig.2 Automatic filtering of artificial objects



To create reliable data sources for meshing, all artificial objects must be eliminated from the point cloud.

RIMINING provides an automated filter algorithm to remove these objects. Predefined settings for artificial objects, vegetation, and points underneath the real surface are provided. All settings are configurable by the user.

RIMINING Data Processing & Analysis

Breaklines are automatically extracted from the scan data and classified as toe and crest lines.

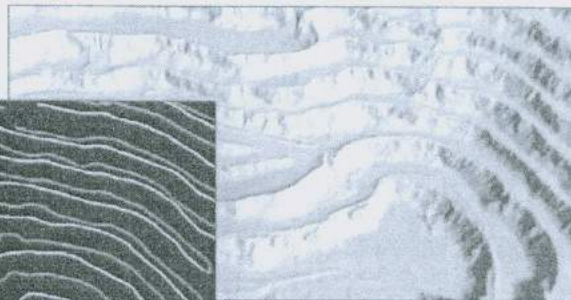


Fig 3 Breakline extraction tool

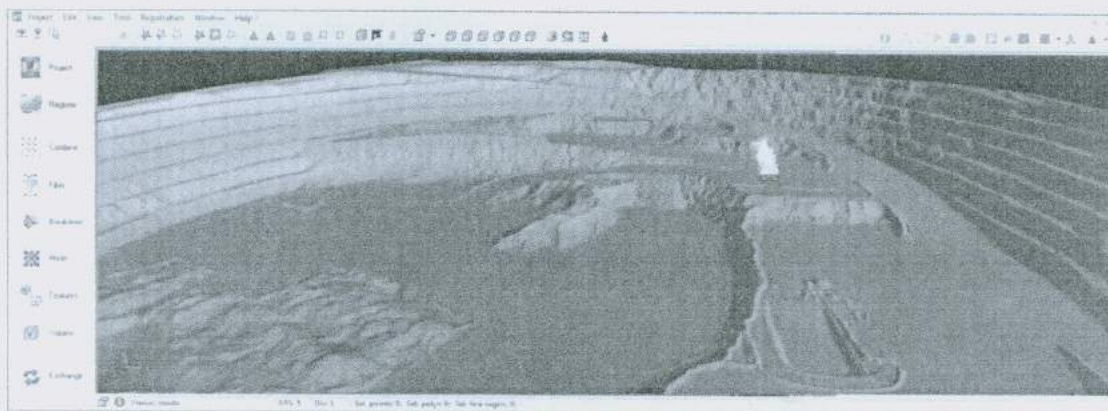


Fig 4 Sample of an open pit mine DTM

A powerful triangulation algorithm is used to create accurate watertight surfaces of the mine site utilizing a fusion of acquired scan data and the extracted breaklines. These surfaces are used for the creation of profiles and sections and as data bases in 3rd-party mine planning software. Intelligent smoothing- and decimating-functions are provided to reduce file sizes and data redundancy while ensuring integrity of the surface geometry information.

Differences between two surfaces can be visualized and calculated as cut- and fill-volumes.

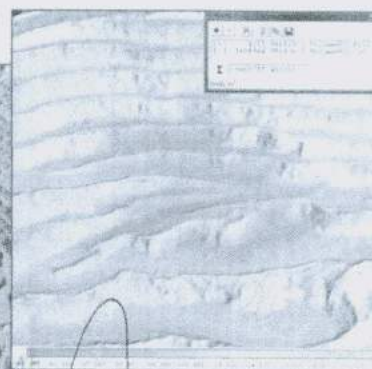


Fig 5 Volume calculation tool



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Region No. 38/07
KOLKATA

22 JUL 2016



RIMINING Workflow

Project Register Combine

Preprocessing



Filter Breaklines Mesh

Surface Modeling



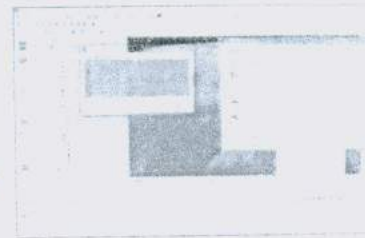
Features To Surface

Feature Extraction



Exchange

Export



UPPER MEASUREMENT SYSTEMS