

**BORANG VI - BORANG SOAL SELIDIK SPESIFIKASI TEKNIKAL UNTUK PEROLEHAN MEMBEKAL PERALATAN DAN PERISIAN UKUR
BAGI LEMBAGA JURUKUR TANAH MALAYSIA (LUT)**

No	Item	Mandatory (M)	Complied (YES / NO)	Remarks or Response by the Tenderer and Cross Reference to the appropriate section, paragraph and page number in the Tender Proposal. Additional marks would be given to detail description and additional useful information.
	GENERAL SPECIFICATION			
1.0	Propose 2 Set GNSS Receiver with Accessories shall have the following specification:			
	GNSS Receiver			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	GNSS CHARACTERISTICS			
	• Minimum 600 GNSS channels and able to track following satellite signal:-	M		
	— GPS L1C/A, L1P(Y), L2C, L2P(Y), L5	M		
	— GLONASS L1C/A, L1P, L2C/A, L2P, L3	M		
	— BeiDou (Phase III) B1, B2	M		
	— Galileo E1, E5a, E5b	M		
	— QZSS L1C/A, L1C, L2C, L5	M		
	— IRNSS L5	M		
	— SBAS L1C/A, L5 (WAAS, EGNOS, MSAS, GAGAN, SDCM)	M		
	— L-band MSS	M		
	• able to support for real-time correction services	M		
	• Capable Patented Z-Blade technology for optimal GNSS performance	M		
	— Full utilization of signals from all 7 GNSS systems (GPS, GLONASS, BeiDou, Galileo, QZSS, IRNSS and SBAS)	M		
	— Enhanced GNSS-centric algorithm: fully-independent	M		
	GNSS signal tracking and optimal data processing, including GPS-only, GLONASS-only, Galileo-only, or BeiDou only solution (Autonomous to full RTK)	M		
	• able to Fast Search engine for quick acquisition and re-acquisition of GNSS signals	M		

• SBAS ranging for using SBAS code & carrier observations and orbits in RTK processing	M		
• Capable Patented Strobe™ Correlator for reduced GNSS multi-path	M		
• able to output 20 Hz real-time raw data (code & carrier and position output)	M		
• able to Supported data formats: ATOM, CMR, CMR+, RTCM 2.1, 2.2, 2.3, 3.0, 3.1 and 3.2 (including MSM), CMRx and sCMRx	M		
• able to output NMEA 0183 messages	M		
REAL-TIME ACCURACY (RMS)			
SBAS (WAAS/EGNOS/MSAS/GAGAN)			
• Horizontal: less than 50 cm or better	M		
• Vertical: less than 85 cm or better	M		
Real-Time DGPS position			
• Horizontal: 25 cm + 1 ppm or better	M		
• Vertical: 50 cm + 1 ppm or better	M		
Real-Time Kinematic Position (RTK)			
• Horizontal: 8 mm + 1 ppm or better	M		
• Vertical: 15 mm + 1 ppm or better	M		
Network RTK			
• Horizontal: 8 mm + 0.5 ppm or better	M		
• Vertical: 15 mm + 0.5 ppm or better	M		
POST-PROCESSED KINEMATIC (PPK)			
• Horizontal: 8 mm + 1 ppm or better	M		
• Vertical: 15 mm + 1 ppm or better	M		
REAL-TIME PERFORMANCE			
• able to Instant-RTK® Initialization	M		
— able to perform 2 sec for baselines < 20 km	M		
— Up to 99.9% reliability	M		
• RTK initialization range at least 40 km	M		

POST-PROCESSING ACCURACY (RMS)			
Static & Fast Static			
• Horizontal: 3 mm + 0.5 ppm or better	M		
• Vertical: 5 mm + 0.5 ppm or better	M		
High-Precision Static			
• Horizontal: 3 mm + 0.1 ppm or better	M		
• Vertical: 3.5 mm + 0.4 ppm or better	M		
DATA LOGGING CHARACTERISTICS			
Recording Interval- able to record in 0.05 - 999 seconds	M		
PHYSICAL CHARACTERISTICS			
Size- Must not more than 22.2 x 19.4 x 7.5 cm (8.7 x 7.6 x 3.0 in)	M		
Weight- Must not more than 1.17 kg (2.57 lb)	M		
User Interface			
• Graphical PMOLED display available	M		
• able to WEB UI (accessible via WiFi) for easy configuration, operation, status, and data transfer	M		
I/O Interface must have following:-			
• RS232 serial link	M		
• USB 2.0/UART	M		
• Bluetooth 5.0 dual mode	M		
• WiFi (802.11 b/g/n)	M		
• 3.5G quad-band GSM (850/900/1800/1900 MHz) / penta-band UMTS module (800/850/900/1900/2100 MHz)	M		
Memory			
• At least 4GB internal memory NAND Flash (3.5 GB user data)	M		
• able to store over two years of 15 sec. raw GNSS data from 14 satellites	M		
• able to input SD/SDHC internal memory card (up to 32GB)	M		

Operation Mode able to do following:-			
• RTK rover & base	M		
• RTK network rover: VRS, FKP, MAC	M		
• NTRIP, Direct IP	M		
• CSD mode	M		
• Post-processing	M		
• RTK bridge	M		
• UHF repeater	M		
• UHF networking	M		
• satellite and cellular/IP	M		
Environmental Characteristics			
• Operating temperature: -40° to +65°C or better	M		
• Storage temperature: -40° to +85°C or better	M		
• Humidity: 100% condensing	M		
• IP67 waterproof, sealed against sand and dust	M		
• Drop: 2m pole drop on concrete	M		
• Shock: ETS300 019	M		
• Vibration: MIL-STD-810F	M		
Power Characteristics			
• 2 Li-Ion hot-swappable batteries, 41.4 Wh (2 x 7.4 V, 2800 mAh)	M		
• Battery life time (two batteries): 10 hrs (GNSS On, and GSM or UHF Rx On)	M		
• able to External DC power: 9-28 V	M		
Standard System Components			
• Come with 2 Li-Ion batteries	M		
• Come with Dual battery charger, power supply and international power cord kit	M		
• Come with Tape measure (3.6 m / 12 ft)	M		
• Come with 7 cm pole extension	M		
• Come with USB to mini-USB cable	M		
• Come with Hard case	M		

1.1 DATA COLLECTOR			
Please Specify Brand:	M		
Please Specify Model:	M		
Please Specify Quantity:	M		
Please Specify Warranty:	M		
GNSS CHARACTERISTICS			
Internal antenna: At least 72 channels and able to detect following satellite signal:-	M		
— GPS L1 C/A	M		
— GLONASS L1 C/A	M		
— Galileo E1	M		
— Beidou B1	M		
— SBAS: WAAS/EGNOS/MSAS/GAGAN/QZSS	M		
— Tri constellation system: GPS/GAL or GPS/GLO/GAL or GPS/Beidou/GAL	M		
• Capable External antenna connector	M		
• able to NMEA output	M		
• able to raw data recording	M		
ACCURACY SPECIFICATIONS			
Horizontal RMS			
• Real-time SBAS: < 1.5 m typical or better	M		
• Post-processed: < 80 cm typical or better	M		
PROCESSOR			
• At least Qualcomm Snapdragon 626 or better	M		
• At least Octa-core	M		
• Clock frequency: 2.2 GHz or better	M		
Operating System			
• Android® 10.0 (Google certified) or better	M		
• Can support Languages : English	M		
• Software package includes: Google Mobile Services, Sat-Look	M		
Android security updates provided until December 2024	M		

Communications			
• GSM(850,900,1800,1900), WCDMA(B1,B2,B5,B8), LTE-FDD (B1/B2/B3/B4/B5/B7/B8/B12/B13/B17/B20/B25/B28), LTE-TDD (B38/B39/B40/B41), TD-SCDMA(B34/B39)	M		
• Capable to Wi-Fi (IEEE) 802.11 a/b/g/n/ac	M		
• Capable to Bluetooth 4.1	M		
• Can use USB 3.0 (Type-C)	M		
• Can use NFC (13.56MHz)	M		
PHYSICAL CHARACTERISTICS			
Size - Not more than 196x93.4x17.2 mm (7.7 x 3.6 x 0.67 inches)	M		
Weight - Not more than 385g (13.6 oz)	M		
User Interface Keyboard			
• Must have 2 volume keys, on/off/reset key, 4 programmable keys, standard Android touch panel buttons	M		
• Must have On screen keyboard	M		
Display			
• At least Size: 6.0" capacitive multi touch	M		
• Resolution: 1920x1080 pixels or better	M		
• Brightness: 450 Cd/m ² or better	M		
• Gorilla Glass damage-resistant or better	M		
• Able to Auto rotate	M		
Memory			
• At least 4 GB SDRAM	M		
• At least Storage: 64 GB (non volatile)	M		
• Able to insert MicroSD memory card (up to 256 GB)	M		
ENVIRONMENTAL CHARACTERISTICS			
• Operating temperature: -20° to +55°C or better	M		
• Storage temperature: -40° to +70°C or better	M		
• Humidity: 95% non condensing	M		
• Water & dust proof: IP67	M		
• Free drop: 1.2 m	M		

Power Characteristics				
• Battery Li-Ion, 8000mAh or better	M			
• Battery life: > 15 hrs @ 20 °C with GPS on	M			
• Must not more than Charging time: 4 hours - Dual Battery Charger	M			
• Able to Remove battery	M			
Interface				
• Capable USB 3.0 (Type-C)	M			
• External antenna connector available	M			
• Can use Audio jack through USB adapter	M			
• Can use Pogo pin connector	M			
Multimedia & Sensor				
• Rear camera 13 M pixels with auto-focus and LED flash or equivalent	M			
• Front camera 5 M pixels with fixed focus or equivalent	M			
• Digital Compass	M			
• Gyrometer	M			
• Accelerometer	M			
• Barometer	M			
• Speaker	M			
• Microphone	M			
• Light sensor	M			
Standard Accessories				
• Lanyard	M			
• Screen Protector	M			
• Handstrap	M			
• A/C Charger	M			
• USB Cable	M			

1.2 POST-PROCESSING SOFTWARE			
Please Specify Brand:	M		
Please Specify Model:	M		
Please Specify Quantity:	M		
Please Specify Warranty:	M		
CONTROL SURVEYING			
Can Confidently produce reliable control coordinates	M		
• Can Create projects with a wide selection of coordinate systems and geoid models	M		
• Can Review, edit and process GNSS, total station, and leveling observations	M		
• Able to Postprocess static GNSS data with HD-GNSS processing engine for more reliable positions	M		
• Able to Adjust traverses and complete networks containing GNSS, total station, and leveling observations	M		
FIELD TO FINISH			
Can Easily create CAD-ready deliverables directly	M		
• Can Import any existing raster and vector data for bidding estimates and project planning	M		
• Can Process feature codes, compute volumes, and automatically model terrain	M		
• Able to Create surfaces and contours from points and breaklines to accurately model terrain	M		
• Able to Plot and save survey designs in a variety of CAD and GIS formats	M		
GIS FEATURE COLLECTION			
Can Expand the utilization of survey systems by creating GIS deliverable	M		
• Able to Create and manage rich feature libraries matching attribute schema, layers and symbology from GIS and CAD	M		
• Can Process feature codes to automatically create geometry and attributes	M		
• Able to Import and export features to a variety file formats including ESRI shape files and geodatabase XML files	M		
• Able to Connect directly to the GIS data system of record to extract schema and data enabling efficient GIS operations	M		

	Accessories			
	Heavy Duty Aluminium Tripod X 1	M		
	Tribach & Adapter X 1	M		
	Extended Pole X 1	M		
	Measuring Tape X 1	M		
	Carbon Pole & Bipod X 1	M		
	Hard Carrying Case X 2	M		
	Rechargeable Battery X 4	M		
	Battery Charger X 1	M		
	Serial Cable / USB Cable X 1	M		
1.3	OTHER REQUIREMENTS			
	Training And Transfer Technology			
	Proposed number of pax	M		
	Proposed number of days	M		
	Proposed of Location	M		

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BAGI LEMBAGA JURUKUR TANAH MALAYSIA (LT)**

No	Item	Mandatory (M)	Complied (YES / NO)	Remarks or Response by the Tenderer and Cross Reference to the appropriate section, paragraph and page number in the Tender Proposal. Additional marks would be given to detail description and additional useful information.
	GENERAL SPECIFICATION			
2.0	Propose 2 Set Total Station with 1" Accuracy & Accessories shall have the following specification:			
	TOTAL STATION			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	GENERAL SPECIFICATIONS			
	Autofocus features	M		
	Capable Tangent Clamps	M		
	Level vials	M		
	Sensitivity of circular level vial on tribrach (10'/2mm)	M		
	Must have double Display LCD back-lit (540 x 480 pixel)	M		
	Must Windows Embedded Compact 7	M		
	Dual Core 800MHz processor or equivalent	M		
	512 MB RAM, 4 GB Flash Memory or equivalent	M		
	ANGLE MEASUREMENT			
	Require Accuracy Standard Deviation 1" (0.3 mgon)	M		
	Reading system Absolute encoder or equivalent	M		
	Circle diameter 62 mm (2.4 in) or equivalent	M		
	Horizontal/Vertical angle Diametrical/Single or equivalent	M		

TELESCOPE			
Tube length 128 mm (5.0 in)	M		
Must be Image Erect	M		
At least Magnification 30x	M		
At least Effective diameter of objective 45mm	M		
Field of view 1°25' or equivalent	M		
Resolving power 3" or equivalent	M		
Minimum focusing distance 1.5 m (4.9 ft)	M		
Tracklight features or equivalent	M		
Reticle Illumination 4 steps or equivalent	M		
TILT SENSOR			
Must have Dual Axis	M		
Must have Liquid-electric detection	M		
Compensation range ±3' or equivalent	M		
COMMUNICATIONS			
Must have Communication ports 1 x serial (RS-232C), 2x USB (host and client)	M		
Must have Wireless Communications Integrated Bluetooth (Class 1, Long Range)	M		
POWER			
Capable to Hot swappable Li-ion battery (x2)	M		
Output voltage 3.6V or equivalent	M		
Charging time shall not more than 6 hour	M		
INTERNAL PLUMMET			
Optical or Class 2 Laser	M		
OPTICAL PLUMMET			
Magnification 3x	M		
Field of view 5°	M		
Minimum focusing distance 0.5 m	M		
DIMENSIONS			
Shall be not more than (W x D x H) 206 mm x 169 mm x 318 mm (8.1 in x 6.7 in x 12.5 in)	M		

WEIGHT			
Shall be not more than 4.3 kg for Main Unit	M		
Carrying case 3.3 kg or less	M		
ENVIRONMENTAL			
Operating temperature range -20 °C to +50 °C (-4 °F to +122 °F) or equivalent	M		
Storage temperature range -25 °C to +60 °C (-22 °F to +140 °F) or equivalent	M		
ATMOSPHERIC CORRECTION			
Temperature range -40 °C to +60 °C (-40 °F to +140 °F) or equivalent	M		
Barometric pressure range 400 mmHg to 999 mmHg / 533 hPa to 1,332 hPa / 15.8 inHg to 39.3 inHg or equivalent	M		
Dust and water protection IP66 or equivalent	M		
DISTANCE MEASUREMENT			
Range with specific prisms with good conditions of reflector sheet 5 cm x 5 cm (1.5 m to 300 m)	M		
Range with specific prisms with good conditions of single prism 6.25 cm (1.5 m to 5000 m)	M		
Reflectorless mode of KGC (18%) with range of 400m (Good), 300m (Normal) and 235m (Difficult)	M		
Reflectorless mode of KGC (90%) with range of 800m (Good), 500m (Normal) and 250m (Difficult)	M		
Accuracy in precise measurement mode of prism $\pm(2+2 \text{ ppm} \times D)$ mm	M		
Accuracy in precise measurement mode of non prism $\pm(3+2 \text{ ppm} \times D)$ mm	M		
Measuring interval for Prism mode come with precise mode (1.0s), normal mode (0.5s) and fast mode (0.3s)	M		
Measuring interval for Non Prism Mode come with precise mode (1.0s), normal mode (0.5s) and fast mode (0.3s)	M		
CERTIFICATION			
Shall be Class B Part 15 FCC certification, CE Mark approval, RCM Mark.	M		
Shall be IEC60825-1 am 2007, IEC60825-1 am 2014, FDA notice 50, EAC / NCC	M		
Prism/Non-prism mode Class 1 laser or equivalent	M		
Laser Pointer Class 2 laser or equivalent	M		

Accessories			
Heavy Duty Aluminium Tripod X 3	M		
Single Target Prism X 2	M		
Mini Prism X 1	M		
Ranging Pole X 1	M		
Survey Umbrella X 1	M		
Rechargeable Battery X 2	M		
Battery Charger X 1	M		
Serial Cable / USB X 1	M		
2.1 OTHER REQUIREMENTS			
Training And Transfer Technology			
Proposed number of pax	M		
Proposed number of days	M		
Proposed of Location	M		

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	GENERAL SPECIFICATION			
3.0	Propose 2 Set Toughbook Field Communicator			
	Toughbook			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	Operating System			
	Window 10 Pro	M		
	Mobile Computing Platform			
	At least Intel® Core™ i5-10310U vPro Processor	M		
	At least 1.7GHz up to 4.4GHz with Intel® Turbo Boost Technology, 6MB Intel Smart Cache	M		
	Graphic Chip			
	At least Intel® UHD Graphics	M		
	Display			
	10.1" TFT LCD HD (1920 x 1200) (WUXGA)	M		
	Capable of sunlight viewable glove and rain mode enabled capacitive touchscreen (up to 1000cd/m ²)	M		
	Capable of IP Digitiser	M		
	Storage			
	At least 16GB RAM DDR4	M		
	At least 512GB OPAL NVMe SSD	M		
	Bluetooth			
	At least Version 5.1 Class 1	M		

Wireless Lan				
At least Intel Wi-Fi 6 AX201	M			
Mobile Broadband				
Support 4G LTE and 3G	M			
GPS				
At least U-Blox NEO-M8N	M			
Sound				
At least Intel® High Definition Audio subsystem support, stereo speaker	M			
Camera				
Front: 2 megapixel with IR / privacy shutter (Windows Hello compliant)	M			
Rear: 8 megapixel with autofocus and LED flash	M			
Configuration Port				
Serial, 2D Barcode Reader, 2nd USB 2.0, 2nd LAN, Thermal by FLIR	M			
Rear Expansion Bay Area				
Smart Card Reader, HF-RFID (NFC) Reader	M			
Power				
Hot swap, standby function, ACPI BIOS	M			
AC Adapter: Input: 100V - 240V AC, 50Hz/60Hz, Output: 15.6V DC, 7.05A	M			
Battery: Li-Ion 11.4V, 4360mAh	M			
Battery Life approx 12 hours	M			
Dimension				
279 x 188 x 23.5mm	M			
Weigh up to 1.19kg	M			
Interface				
USB 3.1 x1	M			
USB 3.1 Type-C PD x1	M			
LAN connector x1	M			
DC in x1	M			
Port replicator connector x1	M			
Dual external antenna connector x1	M			

Accessories				
Power Supply and Power Cord	M			
Standard battery pack	M			
Emissive backlit keyboard (with x1 USB type A and x1 USB type C)	M			
4-Bay Battery Charger	M			
Desktop Cradle	M			
Rotating Hand Strap	M			
Digitizer Pen	M			
Protective Film	M			
Tether	M			
Ruggedisation				
Dust and Water Resistance: IP65	M			
Drop Resistance: Polywood: 120cm / 26 sides / Power Off, Concrete: 120cm / 6 sides / Power Off	M			
Operating Temperature: -10 °C to 50 °C	M			
3.1 Propose 4 License of Survey Application (Software)				
Please Specify Brand:	M			
Please Specify Quantity:	M			
Field Application				
Field to Finish (F2F) concept in the eCadastra environment to capture and automatically processed cadastral data in the field. The field survey data are captured digitally from the Total Stations into the Toughbook and thus eliminate data transcription error and improve the quality and reliability of the data recorded. Field survey booking is done in real time at the touch of a button and provides for verification of survey observation data in the field	M			
Supports end to end integration and automation from field measurement to final survey plans including digital jupem ascii output. Integrate with eCadas Office for final computation and generate final jupem ascii for submission via jupem2u	M			
Can connect easily with all major brands of Total Stations (Nikon, Leica, Trimble, Sokkia and Topcon). It support s real time communications with total station either wireless via Bluetooth or wired via RS232 serial cable	M			
Comprehensive data collection functions, Familiar Data Collection form, Solar Observations, M & C correction, Field sketch, Field Book, Survey computation, Export JUPEM ASCII	M			

Desktop Application				
Desktop version to do the Checking and Processing. Although PDA can do all the checking and computation until Final ASCII files, but eTSMDesk is more convenience for these purposes. eTSMDesk is used to install into Desktop PC for bigger screen, better view. It will be much easier to do the checking, viewing and computation. eTSMDesk and eTSM (PDA) is sharing the same file format,*.ebk.		M		
To set and Log all the setting out point		M		
Export StarNet Data File *.prj and *.dat file to be read with StarNet program and run for the adjustment		M		
Coordinate Comparison with StarNet Adjusted value		M		
Final ASCII output		M		
3.2 OTHER REQUIREMENTS				
Training And Transfer Technology				
Proposed number of pax		M		
Proposed number of days		M		
Proposed of Location		M		

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	GENERAL SPECIFICATION			
4.0	Propose 2 Set Digital Level with Accessories shall have the following specification:			
	DIGITAL LEVEL			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	Technical Data			
	Height accuracies - Standard deviation height measurement per 1 km double run (ISO 17123-2)	M		
	Electronic measurement: 1.0/0.7* mm	M		
	Optical measurement: With standard aluminum E-scale/Numeral staff: 2.5 mm	M		
	Distance accuracies - Standard deviation distance measurement 10 mm for D ≤ 10 m and (Distance in m x 0.001) for D > 10 m	M		
	Range - 2 –100 m (electronic)	M		
	Measuring modes - Single and Tracking	M		
	Time for single measurement - <3 sec	M		
	Compensator - Magnet damped pendulum compensator (range +/- 10 min)	M		
	Telescope - Magnification (optical) 24x	M		
	Data storage - up to 1'000 points	M		
	Environmental conditions - IP55	M		
	Power supply - AA dry cells (4 x LR6/AA/AM3 1.5 V)	M		
	Weight - <2.5 kg	M		
	Accessories			
	Heavy Duty Aluminium Tripod X 1	M		
	Barcode Staff X 2	M		

4.1	OTHER REQUIREMENTS				
	Training And Transfer Technology				
	Proposed number of pax	M			
	Proposed number of days	M			
	Proposed of Location	M			

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	GENERAL SPECIFICATION			
5.0	Propose 2 Unit Laser Distance Meter shall have the following specification:			
	LASER DISTANCE METER			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	Technical Data			
	Accuracy, typ.: ± 1 mm	M		
	Range : 0.05 – 200 m	M		
	Measuring units: m, ft, in	M		
	Tilt sensor: 360°	M		
	Color display with Pointfinder: 4x zoom	M		
	Data interface: Bluetooth® Smart	M		
	Batteries: 2 x AA	M		
	Dimensions: 143 x 58 x 29 mm	M		
	Memory: 30 Displays	M		
	Multifunctional end-piece: automatic recognition	M		
	Personalized Favorites	M		

Functions			
FunctionsDistance measurement: Inclination tracking	M		
Min/max measurement: Area/volume	M		
Smart Horizontal Mode: Addition/subtraction	M		
Height tracking: Pythagoras	M		
Height profile: Stake-out	M		
Sloped objects: Trapezium	M		
Long Range Mode: Calculator	M		

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	GENERAL SPECIFICATION			
6.0	Propose 2 Unit GPS Handheld shall have the following specification:			
	GPS HANDHELD			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity	M		
	Please Specify Warranty:	M		
	SPECIFICATIONS			
	Physical dimensions: 2.4" x 6.3" x 1.4" (6.1 x 16.0 x 3.6 cm)	M		
	Display size:1.43" x 2.15" (3.6 x 5.5 cm); 2.6" diag (6.6cm)	M		
	Display resolution: 160 x 240 pixels	M		
	Display type: Transflective, 65-K color TFT	M		
	Weight: 7.7 oz (217 g) with batteries or lighter	M		
	Battery: 2 AA batteries (not included); NiMH or Lithium recommended	M		
	Battery life: 16 hours	M		
	Water rating: IPX7	M		
	Memory/History: Atleast 16GB or better	M		
	High-sensitivity receiver	M		
	Interface: high-speed mini USB and NMEA 0183 compatible	M		
	Maps & Memory			
	Ability to add maps	M		
	Automatic Routing	M		
	Basemap	M		
	Storage and Power Capacity: microSD™ card (not included)	M		

Map Segments: 3000	M		
Birdseye: 250 Birdseye Imagery files	M		
Waypoints/favorites/locations: 5000	M		
Routes: 200, 250 points per route, 50 points auto routing	M		
Tracks: 200	M		
Track log: 10,000 points, 200 saved tracks	M		
Sensors			
GNSS: GPS, NAVIC, GLONASS, GALILEO	M		
Barometric altimeter	M		
GPS Compass while moving	M		
Compass: (tilt-compensated 3-axis)	M		
Outdoor Recreation Features			
Point-to-point navigation	M		
Custom map compatible	M		
Area calculation	M		
Automatic routing (turn by turn routing on roads)	M		
Geocaching - friendly	M		
ACCESSORIES			
Waterproof Casing	M		

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BAGI LEMBAGA JURUKUR TANAH MALAYSIA (LT)**

No	Item	Mandatory (M)	Complied (YES / NO)	Remarks or Response by the Tenderer and Cross Reference to the appropriate section, paragraph and page number in the Tender Proposal. Additional marks would be given to detail description and additional useful information.
	GENERAL SPECIFICATION			
7.0	Propose 2 Set EML with Accessories shall have the following specification:			
	EML			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	EML LOCATOR SPECIFICATION			
	Dimension: 691 x 325 x 122 mm, (27.2 x 12.8 x 4.75 in)	M		
	Weight (including batteries): at least 2.2 kg (4.8 lb)	M		
	Performance			
	Frequency range: 50 Hz - 200 KHz	M		
	Sensitivity: 33 KHz (1 μ A at 1 m)	M		
	Dynamic range: 117 dB	M		
	Depth: max 6 m (20 ft)	M		
	Locate accuracy: \pm 5% depth	M		
	Dynamic overload protection: 30 dB (automatic)	M		
	Depth accuracy: In line - \pm 5% to 3 m (\pm 5% to 10 ft) Sonde - \pm 5% to 3 m (\pm 5% to 10 ft) Passive - \pm 5% to 3 m (\pm 5% to 10 ft)	M		
	Features			
	Enabled frequencies: 512 Hz, 3.14 KHz, 8.192 KHz, 32.768 KHz, 83.1 KHz, 200 KHz	M		
	Custom frequencies: Up to 100 custom frequencies from 256 Hz - 83 KHz	M		

DE direction enabled: Any frequency from 256 Hz - 10 kHz	M		
Fault-finding DE based: 263 Hz	M		
Cathodic protection frequencies: 100 Hz, 120 Hz	M		
Power frequencies: 50 Hz, 60 Hz, 100 Hz, 120 Hz, 150 Hz, 180 Hz, 450 Hz, 540 Hz	M		
Language support: 17 user selectable	M		
Selectable auto shutdown: 5, 10, 20 or 30 minutes	M		
PC based configuration: Software updates and configuration can be set by user	M		
High contrast graphical LCD	M		
Line direction compass with proportional L/R arrow guidance	M		
Environmental			
Operating temperature: -20 °C - 50 °C (-4 °F - 122 °F)	M		
Storage temperature: -32 °C - 70 °C (-25 °F - 158 °F)	M		
Environmental protection: IP65	M		
Battery			
Batteries: 2 D-cell (LR20)	M		
Battery life: (max) 30 hours continuous, 70 hours intermittent	M		
EMI TRANSMITTER SPECIFICATION			
Dimension: 254 x 305 x 91 mm, (10 x 12 x 7.75 in)	M		
Weight (including batteries): at least 3.4 kg (7.7 lb)	M		
Performance			
Frequency range: 256 Hz - 200 kHz	M		
Current: max 500 mA	M		
Voltage: max 65V rms	M		

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	GENERAL SPECIFICATION			
8.0	Propose 2 Set RTK Drone + Screen Display with Accessories shall have the following specification:			
	RTK Drones			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	GNSS CHARACTERISTICS			
	Single-Frequency, High-Sensitivity GNSS Module	M		
	-GPS+BeiDou+Galileo (Asia)	M		
	-GPS+GLONASS+Galileo (other regions)	M		
	Multi-Frequency Multi-System High-Precision RTK GNSS	M		
	-GPS : L1/L2	M		
	-GLONASS : L1/L2	M		
	-BeiDou : B1/B2	M		
	-Galileo : E1/E5a	M		
	-First-Fixed Time : < 50 s	M		
	Positioning Accuracy: Vertical 1.5 cm + 1 ppm (RMS)	M		
	Horizontal 1 cm + 1 ppm (RMS)	M		
	1 ppm means the error has a 1mm increase for every 1 km of movement from the aircraft.	M		

Aircraft			
Takeoff Weight: 1391 g	M		
Diagonal Distance: 350 mm	M		
Max Service Ceiling Above Sea Level: 19685 ft (6000 m)	M		
Max Ascent Speed: 6 m/s (automatic flight); 5 m/s (manual control)	M		
Max Descent Speed: 3 m/s	M		
Max Speed: 31 mph (50 kph)(P-mode) , 36 mph (58 kph)(A-mode)	M		
Max Flight Time: Approx. 30 minutes	M		
Operating Temperature Range: 32° to 104° F (0° to 40°C)	M		
Operating Frequency			
-Europe, Japan, Korea: 2.400 GHz to 2.483 GHz	M		
-United States, China: 5.725 GHz to 5.850 GHz	M		
Transmission Power (EIRP)			
-2.4 GHz: CE (Europe) / MIC (Japan) / KCC (Korea) : < 20 dBm	M		
-5.8 GHz: SRRC (China) / FCC (United States) / NCC(Taiwan,China) : < 26 dBm	M		
Hover Accuracy Range			
RTK enabled and functioning properly			
-Vertical : ±0.1 m ; Horizontal : ±0.1 m	M		
RTK disabled			
-Vertical : ±0.1 m (with vision positioning) ; ±0.5 m (with GNSS positioning)	M		
-Horizontal : ±0.3 m (with vision positioning) ; ±1.5 m (with GNSS positioning)	M		
The position of the camera center is relative to the phase center of the onboard D-RTK antenna under the aircraft body's axis(36, 0, and 192 mm) already applied to the image coordinates in Exif data. The positive x, y, and z axes of the aircraft body point to the forward, rightward, and downward of the aircraft, respectively	M		
Gimbal			
Stabilization: 3-axis (tilt, roll, yaw)	M		
Pitch: -90° to +30°	M		
Max Controllable Angular Speed: 90°/s	M		
Angular Vibration Range: ±0.02°	M		

Infrared			
Obstacle Sensing Range: 0.6-23 ft(0.2 - 7 m)	M		
FOV			
• Horizontal: 70°	M		
• Vertical: ±10°	M		
Measuring Frequency: 10 Hz	M		
Operating Environment: Surface with diffuse reflection material, and reflectivity > 8% (such as wall, trees, humans, etc.)	M		
Mapping Functions			
Mapping accuracy meets the requirements of the ASPRS Accuracy Standards for Digital Orthophotos Class III (The actual accuracy depends on surrounding lighting and patterns, aircraft altitude, mapping software used, and other factors when shooting)	M		
Ground Sample Distance(GSD)	M		
-(H/36.5) cm/pixel,H means the aircraft altitude relative to shooting scene (unit: m)	M		
Data Acquisition Efficiency	M		
-Max operating area of approx. 1 km ² for a single flight(at an altitude of 182 m, i.e., GSD is approx. 5 cm/pixel, meeting the requirements of the ASPRS Accuracy Standards for Digital Orthophotos Class III	M		
Vision System			
Velocity Range	M		
• ≤31 mph(50 kph) at 6.6 ft(2 m) above ground with adequate lighting	M		
Altitude Range			
• 0-33 ft(0 - 10 m)	M		
Operating Range			
• 0-33 ft(0 - 10 m)	M		
Obstacle Sensing Range			
• 2-98 ft(0.7-30 m)	M		
FOV			
• Forward/Rear: 60° (horizontal)	M		
• ±27° (vertical)(Downward)	M		
• 70° (front and rear)	M		
• 50° (left and right)	M		

Measuring Frequency			
• Forward/Rear : 10 Hz;	M		
• Downward : 20 Hz	M		
Operating Environment			
• Surfaces with clear patterns and adequate lighting(> 15 lux)	M		
Camera			
Sensor: 1" CMOS; Effective pixels: 20 M	M		
Lens: FOV 84° : 8.8 mm / 24 mm(35 mm format equivalent:24 mm) : f/2.8 - f/11, auto focus at 1 m - ∞	M		
ISO Range			
• Video:100-3200(Auto), 100-6400(Manual)	M		
• Photo:100-3200(Auto), 100-12800(Manual)	M		
Mechanical Shutter Speed: 8 - 1/2000 s	M		
Electronic Shutter Speed: 8 - 1/8000 s	M		
Max Image Size			
• 4864×3648 (4:3)	M		
• 5472×3648 (3:2)	M		
Video Recording Modes	M		
• H.264, 4K : 3840×2160 30p	M		
Photo Format: JPEG	M		
Video Format: MOV	M		
Supported File Systems			
• FAT32 (≤ 32 GB)	M		
• exFAT (> 32 GB)	M		
Supported SD Cards- MicroSD, Max Capacity: 128 GB, Class 10 or UHS-1 rating required Write speed≥15 MB/s	M		
Operating Temperature Range: 32° to 104° F (0° to 40°C)	M		
Intelligent Flight Battery			
Capacity: 5870 mAh	M		
Voltage: 15.2 V	M		
Battery Type: LiPo 4S	M		

Energy: 89.2 Wh	M		
Net Weight: 468 g	M		
Charging Temperature Range: 14° to 104°F(-10° to 40°C)	M		
Max charging Power: 160 W	M		
Intelligent Battery Charging Hub(WCH2)			
Input Voltage: 17.3 - 26.2 V	M		
Output Voltage and Current: 8.7 V, 6 A ; 5 V, 2 A	M		
Operating Temperature: 41° to 104°F(5° to 40°C)	M		
SDK Remote Controller			
Operating Frequency			
• Europe, Japan, Korea: 2.400 GHz to 2.483 GHz	M		
• Other countries/regions: 5.725 GHz to 5.850 GHz	M		
EIRP			
• 2.4 GHz	M		
• CE / MIC / KCC: < 20 dbm	M		
• 5.8 GHz	M		
• FCC / SRRC / NCC: < 26 dbm	M		
Max Transmission Distance			
• FCC / NCC: 4.3 mi (7 km)	M		
• CE / MIC / KCC / SRRC: 3.1 mi (5 km) (Unobstructed, free of interference)	M		
Built-in Battery: 6000 mAh LiPo 2S	M		
Operating Current / Voltage: 1.2 A @ 7.4 V	M		
Mobile Device Holder: Tablets and smartphones	M		
Operating Temperature: 32° to 104° F (0° to 40° C)	M		
Remote Controller			
Operating Frequency			
• Europe, Japan, Korea: 2.400 GHz-2.483 GHz	M		
• United States, China: 5.725 GHz-5.850 GHz	M		

Transmission Power (EIRP)			
• 2.4 GHz CE / MIC / KCC : < 20 dBm	M		
• 5.8 GHz SRRC / FCC : < 26 dBm	M		
Max Transmission Distance: FCC : 4.3 mi(7 km) ; SRRC / CE / MIC / KCC : 3.1 mi(5 km) (Unobstructed, free of interference)	M		
Power Consumption: 16 W(typical value)	M		
Display: 5.5 inch screen, 1920x1080, 1000 cd/m ² , Android System , Memory 4G RAM+16G ROM	M		
Operating Temperature Range: 32° to 104° F (0° to 40°C)	M		
Intelligent Flight Battery Charging Hub			
Voltage: 17.5 V	M		
Operating Temperature Range: 41° to 104°F(5° to 40°C)	M		
Capacity: 4920 mAh	M		
Voltage: 7.6 V	M		
Battery Type: LiPo 2S	M		
Energy: 37.39 Wh	M		
Operating Temperature: -4° to 104°F(-20° to 40°C)	M		
AC Power Adapter			
Voltage: 17.4 V	M		
Rated Power: 160 W	M		

8.1	ACCESSORIES			
	AirCraft Body x1	M		
	Remote Controller x1	M		
	Propeller x 4	M		
	Intelligent Battery x 3	M		
	AC Power Cable +Adapter x 1	M		
	Intelligent Flight Battery Charger Hub x 1	M		
	Gimbal Clamp x 1	M		
	Micro SD 16GB x 1	M		
	Weatherproof Bag x 1	M		
	D-RTK Mobile Station x 1	M		
	Tripod Stand + Adapter x 1	M		
	Screen Display x 1	M		
8.2	2 UNIT UAV PROCESSING SOFTWARE			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	SPECIFICATION:			
	Measure Polyline and surface. Measure distances and areas by setting vertices in the 3D model and in the original images.	M		
	Assign a custom scale to non-georeferenced projects for accurate measurements.	M		
	Measure volumes in 3D with a fully-adjustable base height.	M		
	Improve visual integrity. Orthomosaic editor. Create and edit regions in the orthomosaic. Choose the best content from multiple underlying images to remove moving objects or artifacts.	M		
	Unlock the full potential of multispectral data. Create and customize index maps using multispectral imagery with radiometric accuracy.	M		
	Produce application maps by integrating the results, such as prescription maps, into all major farm management software.	M		

Flatten & smooth surfaces. DSM and mesh editing>Create surfaces to improve planarity or fill holes in critical areas.	M		
Automatically uncover insights. Automatic point cloud classification	M		
Point cloud editor. Manually remove noise or unwanted elements, crop a project to focus on an area of interest, or classify objects.	M		
Project merging / splitting	M		
Detailed quality report	M		
Error ellipsoid displaying MTP/GCPs accuracy in 3D	M		
Rolling shutter correction	M		
Scale and orientation constraint	M		
Image masking for disregarding invalid pixels among all images	M		
Volume management for stockpile or earthwork inventory	M		
Object creation and digitization	M		
Tiled Level-of-Detail (LOD) mesh	M		
Import LIDAR point clouds for DSM generation	M		
Automatic DTM generation	M		
Orthoplaner for creating orthomosaic of any plane/facade	M		
Radiometric adjustment to generate accurate index and thermal maps	M		
Custom indices for raster computation based on reflectance values	M		
Multi-core CPU processing	M		
GPU-accelerated processing	M		
Fly through video	M		
OUTPUTS			
Full-color point cloud	M		
Digital Terrain Model (DTM)	M		
Digital Surface Model (DSM)	M		
Contour lines	M		
3D textured mesh	M		
Classified point cloud	M		
Orthomosaic	M		
Facade orthomosaic	M		

	Facade digital surface model	M		
	Reflectance maps	M		
	Index maps	M		
	Thermal maps	M		
	.shp, .dxf, .pdf, Geotiff (.tif), .xyz, .las, .laz,	M		
8.3	OTHER REQUIREMENTS			
	Training And Transfer Technology			
	Proposed number of pax	M		
	Proposed number of days	M		
	Proposed of Location	M		

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	GENERAL SPECIFICATION			
9.0	Propose 2 Unit Prismatic Compass :			
	PRISMATIC COMPASS			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	KEY FEATURES			
	Horizontal readings available, and horizontal circle is provided with unique "O-BAC" device for zero-setting	M		
	Provided with reversible type telescope level with reflecting mirror.	M		
	Stadia survey is available with the telescope reticle	M		
	ACCURACY			
	Telescope - reversible, erect, 12x, 120mm long	M		
	Telescope level - 5' / 2 mm	M		
	Horizontal circle - 5', "O-BAC" Zero setting	M		
	Compass circle - Dia. = 70mm, 1 degree	M		
	Vertical circle - full circle, 1 degree	M		
	Weight (with case) - 1.3kg	M		

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	GENERAL SPECIFICATION			
10.0	Propose 2 Unit Measuring Tape (100M) :			
	MEASURING TAPE 100M (fiberglass)			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity	M		
	Please Specify Warranty:	M		

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	GENERAL SPECIFICATION			
11.0	Propose 2 Unit GIS Software shall have the following specification:			
	GIS SOFTWARE			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
11.1	FEATURES			
	Fast processing, visualization and analysis of high resolution grid data.	M		
	Atleast using Smart Indexing that improve performance of operation	M		
	New support for touch screen tablets including multi touch gestures	M		
	Must have an integration with the Spectrum Enterprise Geocoding Module (EGM)	M		
	Must have a multi-page layout with previews and easy navigation	M		
	Must have dynamic graticules to the map	M		
	Can rotate images	M		
	Must have symbol, polyline and polygon annotations	M		
	Must have a support for scale bars on layout canvas	M		
	Must have support for interoperability with third-party technologies through the import and export of a wide range of grid and imagery formats.	M		
	Must be compatible with the eCadastral environment	M		

11.2	OTHER REQUIREMENTS				
	Training And Transfer Technology				
	Proposed number of pax	M			
	Proposed number of days	M			
	Proposed of Location	M			