

# **LAMPIRAN A**

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

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.
	<b>GENERAL SPECIFICATION</b>			
1.0	Propose 1 Set GNSS Receiver with Accessories shall have the following specification:			
	<b>GNSS Receiver</b>			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	<b>GNSS CHARACTERISTICS</b>			
	• 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		
<b>REAL-TIME ACCURACY (RMS)</b>				
<b>SBAS (WAAS/EGNOS/MSAS/GAGAN)</b>				
	• Horizontal: less than 50 cm or better	M		
	• Vertical: less than 85 cm or better	M		
<b>Real-Time DGPS position</b>				
	• Horizontal: 25 cm + 1 ppm or better	M		
	• Vertical: 50 cm + 1 ppm or better	M		
<b>Real-Time Kinematic Position (RTK)</b>				
	• Horizontal: 8 mm + 1 ppm or better	M		
	• Vertical: 15 mm + 1 ppm or better	M		
<b>Network RTK</b>				
	• Horizontal: 8 mm + 0.5 ppm or better	M		
	• Vertical: 15 mm + 0.5 ppm or better	M		
<b>POST-PROCESSED KINEMATIC (PPK)</b>				
	• Horizontal: 8 mm + 1 ppm or better	M		
	• Vertical: 15 mm + 1 ppm or better	M		
<b>REAL-TIME PERFORMANCE</b>				
	• 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		
<b>POST-PROCESSING ACCURACY (RMS)</b>				
<b>Static &amp; Fast Static</b>				
	• Horizontal: 3 mm + 0.5 ppm or better	M		
	• Vertical: 5 mm + 0.5 ppm or better	M		
<b>High-Precision Static</b>				
	• 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		
<b>1.1</b>	<b>DATA COLLECTOR</b>			
	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			
<b>Horizontal RMS</b>			
• Real-time SBAS: < 1.5 m typical or better	M		
• Post-processed: < 80 cm typical or better	M		
PROCESSOR			
• At least Qualcomm Snapdragon 410 or better	M		
• At least Quad-core	M		
• Clock frequency: 1.2 GHz or better	M		
<b>Operating System</b>			
• Android® 6.0 (Google certified) or better	M		
• Can support Languages :English	M		
• Software package includes: Google Mobile Services, Sat-Look	M		
<b>Communications</b>			
• Capable to Wi-Fi (IEEE) 802.11 b/g/n	M		
• Capable to Bluetooth 4.0 dual mode	M		
• Can use USB (micro B USB connector)	M		
PHYSICAL CHARACTERISTICS			
Size- Not more than 164x82x14.6 mm (6.45x3.22x0.57 inches)	M		
Weight- Not more than 310 g with extended battery (278 g for Wi-Fi only version with standard battery)	M		
<b>User Interface Keyboard</b>			
• Must have 2 volume keys, on/off/reset key, 2 programmable keys, standard Android touch panel buttons	M		
• Must have On screen keyboard	M		

Display			
• At least Size: 5.3" capacitive multi touch	M		
• Resolution: 1280x720 pixels or better	M		
• Brightness: 450 Cd/m <sup>2</sup> or better	M		
• Gorilla Glass damage-resistant or better	M		
• Able to Auto rotate	M		
Memory			
• At least 2 GB SDRAM	M		
• At least Storage: 8 GB	M		
• Able to insert MicroSDHC™ memory card	M		
ENVIRONMENTAL CHARACTERISTICS			
• Operating temperature: -20° to +60°C or better	M		
• Storage temperature: -30° to +70°C without battery or better	M		
• Humidity: 95% non condensing	M		
• Water & dust proof: IP67	M		
• Free drop: 1.2 m on concrete	M		
Power Characteristics			
• Battery Li-Ion, 3100mAh or better	M		
• Battery life: > 15 hrs @ 20 °C with GPS on 3 or better	M		
• Must not more than Charging time: 4 hours	M		
• Able to Remove battery	M		
Interface			
• Capable USB 2.0 (micro)	M		
• External antenna connector available	M		
• Can use Audio jack 2.5 plug (CTIA/AHJ standards)	M		
• Can use Pogo pin connector (Serial, USB, Power in)	M		



<b>Multimedia &amp; Sensor</b>				
	• Rear camera 8 M pixels with flash light or equivalent	M		
	• Front camera 2 M pixels or equivalent	M		
	• G-sensor	M		
	• Speaker	M		
	• Microphone	M		
	• Light sensor	M		
<b>1.2</b>	<b>POST-PROCESSING SOFTWARE</b>			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
<b>CONTROL SURVEYING</b>				
	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		
<b>FIELD TO FINISH</b>				
	<b>Can Easily create CAD-ready deliverables directly</b>	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		
<b>GIS FEATURE COLLECTION</b>				
	<b>Can Expand the utilization of survey systems by creating GIS deliverable</b>	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		
<b>Accessories</b>				
	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		
<b>1.3</b>	<b>OTHER REQUIREMENTS</b>			
	<b>Training And Transfer Technology</b>			
	Proposed number of pax	M		
	Proposed number of days	M		
	Proposed of Location	M		

**BORANG VI - BORANG SOAL SELIDIK SPESIFIKASI TEKNIKAL UNTUK PEROLEHAN MEMBEKAL PERALATAN DAN PERISIAN UKUR  
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	<b>GENERAL SPECIFICATION</b>			
2.0	Propose 1 Unit Total Station with 1" Accuracy & Accessories shall have the following specification:			
	<b>TOTAL STATION</b>			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	<b>GENERAL SPECIFICATIONS</b>			
	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 (640 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		
	<b>ANGLE MEASUREMENT</b>			
	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		

<b>TELESCOPE</b>			
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		
<b>TILT SENSOR</b>			
Must have Dual Axis	M		
Must have Liquid-electric detection	M		
Compensation range ±3' or equivalent	M		
<b>COMMUNICATIONS</b>			
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		
<b>POWER</b>			
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		
<b>INTERNAL OPTICAL PLUMMET OR CLASS 2 LASER</b>	M		
<b>DIMENSIONS</b>			
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		
<b>WEIGHT</b>			
Shall be not more than 4.3 kg for Main Unit	M		
Carrying case 3.3 kg or less	M		
<b>ENVIRONMENTAL</b>			
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		
<b>ATMOSPHERIC CORRECTION</b>			
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		

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	<b>GENERAL SPECIFICATION</b>			
3.0	<b>Propose 1 Set Toughbook Field Communicator</b>			
	<b>Toughbook</b>			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	<b>Operating System</b>			
	Window 10 Pro	M		
	<b>Mobile Computing Platform</b>			
	At least Intel® Core™ m-5-6Y57 Technology vPro Processor	M		
	At least 1.1GHz up to 2.8GHz with Intel® Turbo Boost Technology, 4MB Intel Smart Cache	M		
	<b>VGA Controller</b>			
	At least Intel® HD Graphic 515	M		
	<b>Display</b>			
	10.1" TFT LCD HD (1920 x 1200 dots)	M		
	Multi Touch Screen, Anti glare, Anti reflection	M		
	<b>Storage</b>			
	At least 8GB RAM	M		
	At least SSD 128GB/256GB	M		
	<b>Keyboard</b>			
	LED Backlit Membrane Keyboard	M		

<b>Pointing Device</b>			
Touchscreen- Multi Touch Screen	M		
<b>Power</b>			
AC Adapter (100-240VAC, 50/60Hz)	M		
Li-Ion Battery 11.4V, 26000mAh	M		
Operating Time 8 Hours	M		
<b>Dimension</b>			
272 x 233 x 33.5mm	M		
Weigh up to 1.76kg	M		
<b>Interface</b>			
USB 3.0 x 3	M		
USB 2.0 x 1	M		
LAN connector x 2	M		
Serial x 1	M		
HDMI x 1	M		
VGA x 1	M		
Headset x 1	M		
Port replicator connector x 1	M		
Dual external antenna connector x 1	M		
<b>Connectivity</b>			
Bluetooth, WLAN, 4G mobile broadband	M		
<b>Accessories</b>			
AC Adapter Cable	M		
Li-Ion Battery	M		
Bag Pack	M		

<b>3.1</b>	<b>Propose 1 License of Survey Application (Software)</b>			
	Please Specify Brand:	M		
	Please Specify Quantity:	M		
	<b>Field Application</b>			
	Field to Finish (F2F) concept in the eCadastr 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 jupem2u for submission via jupem2u	M		
	Can connect easily with all major brands of Total Stations (Nikon, Leica, Trimble, Sokkia and Topcon). It supports 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		
	<b>Desktop Application</b>			
	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		
<b>3.2</b>	<b>OTHER REQUIREMENTS</b>			
	<b>Training And Transfer Technology</b>			
	Proposed number of pax	M		
	Proposed number of days	M		
	Proposed of Location	M		

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	<b>GENERAL SPECIFICATION</b>			
4.0	Propose 1 Unit Digital Level with Accessories shall have the following specification:			
	<b>DIGITAL LEVEL</b>			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	<b>Technical Data</b>			
	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 min 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		
	<b>Accessories</b>			
	Heavy Duty Aluminium Tripod X 1	M		
	Barcode Staff X 2	M		
<b>4.1</b>	<b>OTHER REQUIREMENTS</b>			
	<b>Training And Transfer Technology</b>			
	Proposed number of pax	M		
	Proposed number of days	M		
	Proposed of Location	M		

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	<b>GENERAL SPECIFICATION</b>			
5.0	Propose 1 Unit Laser Distance Meter shall have the following specification:			
	<b>LASER DISTANCE METER</b>			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	<b>Technical Data</b>			
	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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	<b>GENERAL SPECIFICATION</b>			
<b>6.0</b>	<b>Propose 1 Unit GPS Handheld shall have the following specification:</b>			
	<b>GPS HANDHELD</b>			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity	M		
	Please Specify Warranty:	M		
	<b>SPECIFICATIONS</b>			
	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: 9.2 oz (260.1 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 4 GB or better	M		
	High-sensitivity receiver	M		
	Interface: high-speed USB and NMEA 0183 compatible	M		

<b>Maps &amp; Memory</b>			
Ability to add maps	M		
Basemap	M		
Storage and Power Capacity: microSD™ card (not included)	M		
Waypoints/favorites/locations: 5000	M		
Routes: 200	M		
Track log: 10,000 points, 200 saved tracks	M		
<b>Sensors</b>			
Barometric altimeter	M		
Compass: (tilt-compensated 3-axis)	M		
<b>Outdoor Recreation Features</b>			
Area calculation	M		
Automatic routing (turn by turn routing on roads)	M		
Geocaching - friendly	M		

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	<b>GENERAL SPECIFICATION</b>			
7.0	Propose 1 Unit EML with Accessories shall have the following specification:			
	<b>EML</b>			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	<b>GENERAL SPECIFICATIONS</b>			
	POWER - shall be 50 / 60 Hz mains electrical and harmonics	M		
	RADIO - shall be 15kHz to 60kHz	M		
	AUTO - shall be Power, Radio, 33kHz	M		
	Transmitter Modes - shall be 131.072 (131) kHz, 32.768 (33) kHz, 8.192 (8) kHz, 512 Hz, 640 Hz	M		
	Depth Range - Shall be Line 0.1m to 7m, Sonde 0.1 to 10m	M		
	Depth accuracy - 5%	M		
	Bluetooth - shall be Class 2 BLE dual mode module, Bluetooth Classic 2.1, Bluetooth 4.0 (LE)	M		
	GPS - Shall be Chipset (1): u-blox@GPS, Receiver Type: GPS L1C/A, SBAS L1C/A, QZSS L1C/A, GLONASS L10F, BeiDou B1, Accuracy (2): Horizontal Position 2.5 m, Autonomous, 2.0 m SBAS, CEP, Start time: Cold 45 s typical, Aided 7 s, typical, Hot 1 s typical or equivalent	M		
	Memory Capacity - shall be not less than 8 GB internal memory	M		
	Environmental Standard - IP66 or equivalent	M		
	Operating Temperature - -20 °C to +50 °C, -4 °F to +122°F or equivalent	M		
	Battery - 7.4V Rechargeable Li - Ion or equivalent	M		
	Battery operating time - 15 h or equivalent	M		
	Dimensions (HxWxD) - 765x290 x93mm, 30.12 x11.42x3.66 inches or equivalent	M		
	Weight with batteries - 2.7Kg, 5.95 lbs or equivalent	M		
	<b>EML TRANSMITTER SPECIFICATION</b>			
	Induction Mode Frequencies - shall be 32.768 (33) kHz / 8.192 (8) kHz or equivalent	M		
	Power Output- Up to 1 Watt max. or equivalent	M		
	Direct Connection Mode Frequencies - 131.072 (131) kHz / 32.768 (33) kHz / 8.192 (8) kHz / 512 Hz / 640 Hz or equivalent	M		
	Power Output- Up to 3 Watt max or equivalent	M		
	Environmental Standard - IP67 or equivalent	M		

Operating Temperature - -20 °C to +50 °C / -4 °F to +122°F or equivalent	M		
Storage temperature - -40°C to +70°C, / -40°F to +158°F or equivalent	M		
Battery - 7.4V Rechargeable Li-ion or equivalent	M		
Battery operating time - 15 h or equivalent	M		
Dimensions (HxWxD) - 250 x 206 x 113 mm / 9.84 x 8.11 x / 4.45 inches or equivalent	M		
Weight with batteries - 2.38Kg / 5.25 lbs or equivalent	M		
<b>Accessories</b>			
EML RECEIVER X 1	M		
RECHARGEABLE BATTERY X 1	M		
CHARGER X 1	M		
SYSTEM BAG X 1	M		
TRANSMITTER X 1	M		
GROUND STAKE X 1	M		
DIRECT CONNECTION CABLE X 1	M		
CLAMP X 1	M		
RECHARGEABLE BATTERY FOR TRANSMITTER X 1	M		
CHARGER TRANSMITTER X 1	M		
SONDE X 1	M		



7.1	<b>OTHER REQUIREMENTS</b>			
	<b>Training And Transfer Technology</b>			
	Proposed number of pax	M		
	Proposed number of days	M		
	Proposed of Location	M		

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

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.
	<b>GENERAL SPECIFICATION</b>			
8.0	<b>Propose 1 Set RTK Drone + D-RTK 2 Mobile with Accessories shall have the following specification:</b>			
	<b>RTK Drones + D-RTK 2 Mobile</b>			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	<b>GNSS CHARACTERISTICS</b>			
	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		
	<b>Aircraft</b>			
	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		
	<b>Operating Frequency</b>			

-Europe, Japan, Korea: 2.400 GHz to 2.483 GHz	M		
-United States, China: 5.725 GHz to 5.850 GHz	M		
<b>Transmission Power (EIRP)</b>			
-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		
<b>Hover Accuracy Range</b>			
<b>RTK enabled and functioning properly</b>			
-Vertical : ±0.1 m ; Horizontal : ±0.1 m	M		
<b>RTK disabled</b>			
-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		
<b>Gimbal</b>			
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		
<b>Infrared</b>			
Obstacle Sensing Range: 0.6-23 ft(0.2 - 7 m)	M		

<b>FOV</b>			
• 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		
<b>Mapping Functions</b>			
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 <sup>2</sup> 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		
<b>Vision System</b>			
Velocity Range	M		
• ≤31 mph(50 kph) at 6.6 ft(2 m) above ground with adequate lighting	M		
<b>Altitude Range</b>			
• 0-33 ft(0 - 10 m)	M		
<b>Operating Range</b>			
• 0-33 ft(0 - 10 m)	M		
<b>Obstacle Sensing Range</b>			
• 2-98 ft(0.7-30 m)	M		
<b>FOV</b>			
• Forward/Rear: 60° (horizontal)	M		
• ±27° (vertical)( Downward)	M		
• 70° (front and rear)	M		
• 50° (left and right)	M		
<b>Measuring Frequency</b>			
• Forward/Rear : 10 Hz;	M		
• Downward : 20 Hz	M		

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

<b>Intelligent Flight Battery</b>			
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		
<b>Intelligent Battery Charing Hub(WCH2)</b>			
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		
<b>SDK Remote Controller</b>			
<b>Operating Frequency</b>			
• Europe, Japan, Korea: 2.400 GHz to 2.483 GHz	M		
• Other countries/regions: 5.725 GHz to 5.850 GHz	M		
<b>EIRP</b>			
• 2.4 GHz	M		
• CE / MIC / KCC: < 20 dBm	M		
• 5.8 GHz	M		
• FCC / SRRC / NCC: < 26 dBm	M		
<b>Max Transmission Distance</b>			
• FCC / NCC: 4.3 mi (7 km)	M		
• CE / MIC / KCC / SRRC: 3.1 mi (5 km) (Unobstructed, free of interference)	M		
<b>Built-in Battery:</b> 6000 mAh LiPo 2S	M		
<b>Operating Current / Voltage:</b> 1.2 A @ 7.4 V	M		
<b>Mobile Device Holder:</b> Tablets and smartphones	M		
<b>Operating Temperature:</b> 32° to 104° F (0° to 40° C)	M		

	<b>Remote Controller</b>			
	<b>Operating Frequency</b>			
	• Europe,Japan,Korea: 2.400 GHz-2.483 GHz	M		
	• United States, China: 5.725 GHz-5.850 GHz	M		
	<b>Transmission Power (EIRP)</b>			
	• 2.4 GHz CE / MIC / KCC : < 20 dBm	M		
	• 5.8 GHz SRRC / FCC : < 26 dBm	M		
	<b>Max Transmission Distance:</b> FCC : 4.3 mi(7 km) ; SRRC / CE / MIC / KCC : 3.1 mi(5 km) (Unobstrcted, free of interference)	M		
	<b>Power Consumption:</b> 16 W(typical value)	M		
	<b>Display:</b> 5.5 inch screen, 1920×1080, 1000 cd/m², Android System , Memory 4G RAM+16G ROM	M		
	<b>Operating Temperature Range:</b> 32° to 104° F (0° to 40°C)	M		
	<b>Intelligent Flight Battery Charging Hub</b>			
	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		
	<b>AC Power Adapter</b>			
	Voltage: 17.4 V	M		
	Rated Power: 160 W	M		
<b>8.1</b>	<b>ACCESSORIES</b>			
	AirCraft Body x1	M		
	Remote Controller x1	M		
	Propeller x 4	M		
	Intelligent Battery x 2	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		
	Carrying Case x 1	M		
	D-RTK Mobile Station x 1	M		
	Tripod Stand + Adapter x 1	M		
8.2	<b>1 UNIT UAV PROCESSING SOFTWARE</b>			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	<b>SPECIFICATION:</b>			
	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		
	Orthoplane for creating orthomosaic of any plane/façade	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		
	<b>OUTPUTS</b>			
	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		
<b>8.3</b>	<b>OTHER REQUIREMENTS</b>			
	<b>Training And Transfer Technology</b>			
	Proposed number of pax	M		
	Proposed number of days	M		
	Proposed of Location	M		

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

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.
	<b>GENERAL SPECIFICATION</b>			
9.0	Propose 1 Unit Prismatic Compass :			
	<b>PRISMATIC COMPASS</b>			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity:	M		
	Please Specify Warranty:	M		
	<b>KEY FEATURES</b>			
	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		
	<b>ACCURACY</b>			
	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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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			
10.0	Propose 1 Unit Measuring Tape (30M) :			
	MEASURING TAPE 30M (Fiberglass)			
	Please Specify Brand:	M		
	Please Specify Model:	M		
	Please Specify Quantity	M		
	Please Specify Warranty:	M		