No. P-63013/30 /2019/Mod-I/BSF Government of India Ministry of Home Affairs Directorate General Border Security Force (Prov Dte: Mod Cell)

(Fax: 011-24367683)

Block No.10, CGO Complex, Lodhi Road, New Delhi-03 Dated, the <u>1</u>[•] April 2019

To,

DsG : AR (through LOAR), CISF, CRPF, ITBP, SSB, NSG & BPR&D

Sub: Forwarding of revised QRs and Trial Directives of Hand Held Thermal Imager (Cooled/Uncooled Version)

Find enclosed herewith revised QRs and Trial Directives of **"Hand Held Thermai Imager (Cooled/Uncooled Version)** " as per appendix 'A' and 'B' duly finalized by Sub group of technical experts and approved by DG BSF for your information and necessary action please.

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Encl : As above

10/4/1.5 Dy. Inspector General (Prov) FHQ BSF, New Delhi

Copy to :-

- 1. SO (IT), North Block MHA, New Delhi
- IT Cell FHQ BSF, New Delhi

- You are requested to host the above QRs and TDs on MHA website please.
- You are requested to host the above QRs and TDs on BSF website please.
- 3. Prov Dte ;
- for info and necessary action pse.

REVISED QRS/TDS OF HAND HELD THERMAL IMAGER (COOLED VERSION)

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S. No.	Specification	Procedure suggested for trial for BOO	Result expected/desired
1.	a) Be binocular / biocular	To be physically checked by the BOO for binocular/ biocular.	HHTI must be binocular / biocular
	b) Have capability to produce real time picture	To be physically checked by BOO on Eye Piece as well as on external device.	It must produce real time picture.
	c) Should be rugged for operations as per JSS 55555 or MIL 810 F and comply IP 65 or better standards.	Firm has to submit National /International accredited Lab certificate. If no such lab available in India then , firm has to submit any Indian Govt Lab/OEM certificate in respect of the same.	System must be rugged for operations as per JS555555 or 810 F MIL and IP 65 or better standards.
	d) Should have a ruggedized / customized container for transportation	To be physically checked by the BOO. Transportation case placed at a height of minimum 2 mtr with HHTI inside and drop on a hard surface. Transportation case should not be deformed and have any crack. Eqpt should work properly.	Transportation case should not be deformed and have any crack. Eqpt should work properly.
	e)Penetrate darkness, haze and smoke	Switch on the system in different conditions like full dark night, haze and smoke and observe the image on external LCD/LED screen. For creating the smoke condition BOO should use smoke candles. Sensor should work in all condition.	HHTI must be capable to see through darkness, haze and smoke .

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	f)Not get damaged if faced towards sun accidentally.	Switch on the system and direct towards the sun for 2 to 3 seconds. After this system should work properly.	It must not get damaged if faced towards sun accidently.
	g) Be immune to glare of searchlights.	Switch on the searchlight and throw its beam towards HHTI in operational mode for 2 to 3 sec. After this system should work properly.	It must be immune to glare of searchlights.
	h) Have a suitable tint to reduce eyestrain. This feature should help the observer to quickly regain his normal vision.	To be physically checked by the BOO	It must have suitable tint to reduce eyestrain this feature should help the observer to quickly regain his normal vision.
	 i) Weight of HHTI without optional modules and battery : 3.5 Kg HHTI with all optional modules and without battery : 4.5 Kg. 	To be physically checked by the BOO.	Weight of the system must be 3.5 Kg or less without optional modules and battery and 4.5 Kg with all optional modules and without battery
	j) Should be able to be fixed on tripod as well as Pole, Tower or Mast or otherwise as specified by the user Dept. Interface to be provided by firm.	To be physically checked by the BOO. An undertaking in this regard should also be obtained from the firm.	It must be able to be fixed on Tripod, pole, tower and mast. (To be specified by the user at the time of tender).
	k) Provision for switch ON/OFF of internal display (Eye piece assembly) through console unit of HHTI as well as C2 (for CIBMS compliant)	To be physically checked by the BOO.	It must have Provision for switch ON/OFF of internal display (Eye piece assembly) through console unit of HHTI as well as C2 (for CIBMS complaint).
	 All keys and controls should be provided on top of the HHTI and also through IP network to C2 console for CIBMS 	To be physically checked by the BOO.	All keys and controls must be provided on top of the HHTI and also through IP network to C2 console for CIBMS compliant version.
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	compliant version .		
	m) Provide real-time pixel level sensor fusion between TI & day camera mode (Optional - to be specified by the user department)	To be physically checked by the BOO.	It must have real-time pixel level sensor fusion between TI & day camera
2	TECHNICAL SPECIFICATION:		
	a) Cryogenic Sterling Closed Cycle Detector Dewar Cooler for IR detector or better.	Check the DDC OEM certificate or data sheet submitted by the firm for DDC type.	It must be Cryogenic Sterling Closed Cycle Detector Dewar Cooler for IR detector or better
	b) Advanced IR Detector having resolution 640 x 480 or better for sharper Thermal Images.	Check the DDC OEM certificate or data sheet submitted by the firm for DDC type and its resolution. BOO will also physically check sharpness of thermal image on external OLED /LCD screen.	IR detector must have resolution 640 x 480 or better.
	c) Pixel pitch - 17 μm pitch or better	Check the DDC OEM certificate or data sheet submitted by the firm for DDC type and its pixel pitch.	It must have Pixel pitch - 17 µm pitch or better
	 d) Field of view: Wide : 12.5° x 10° (min) Narrow : 2.5° x 2° (max) Note: Field of view should be achieved optically only. 	Fix the equipment on ATS (Acceptance Test Station) observe the TI image only and measure both field of view degree in horizontal and vertical and note down the readings. In addition firm should submit OEM certificate supporting the specified parameters.	FOV limits of the system must be as mentioned in the QRs Para 2 (d).
	e) Magnification : Optical Zoom : 5x (min) continuous	Check the optical zoom of the system in the lab and also check the digital zoom as per procedure.	Magnification limits of the system must be as per mentioned in the QRs Para 2 (e).
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	Digital Zoom : 4x or better		
	f) The HHTI initialization time should not be more than 8 minutes	To be physically checked by the BOO	Initialization time of the system must not be more than 8 minutes.
	g) Reticule for range estimation : in built	To be physically checked by the BOO	It must have inbuilt reticule for range estimation
	h) Automatic and manual focusing facility.	To be physically checked by the BOO The system should be auto focus in both FOV when the user change the field of view as well as manually focus on particular targets.	It must have facility of Automatic and manual focusing.
	i) Non Uniformity Calibration (NUC).	To be physically checked by the BOO for NUC facility .OEM certificate also required	It must have NUC.
	j) Polarity (black Hot and white Hot)	To be physically checked by the BOO	It must have Polarity (black Hot and white Hot)
	 k) It should have provision for external video output (PAL). (Through BNC connector for hand held version only) 	To be physically checked by the BOO	There must be a provision for connecting HHTI with external video monitor through BNC connector.
	 Warranty on IR Sensor should be 04 years or 10000 working hrs whichever is earlier. 	Check the undertaking certificate submitted by the firm regarding warranty of the IR Sensor	warranty of IR sensor must not less than 4 years or 10000 working hrs whichever is earlier.
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	Operational :		
	a) Range for human target Detection : 3 Km	Detection : Move a group of 03 persons at a distance of 3 Km. HHTI should detect the movement.	
		Detection means :- ability to detect vehicles ,structures (man made/normal) and any movement of man or animal.	
	Recognition : 1.5 Km	Recognition : Move group of 03 persons at a distance of 1.5 Km. HHTI should recognize the human being.	
		Recognition :- ability to differentiate between civilian/uniformed personnel with manpack.	Human target detection, recognition and identification though HHTI must be achieved as per para-3(a)
	Identification : 500 Mtr.	Identification : Move group of 03 persons with weapons. HHTI should identify the presence of weapon with human being (rifle). Presence of man with weapon (rifle) raised overhead by the hand must be seen.	
		Identification may be restricted to identify the presence of human being with weapon (INSAS Rifle)	
	b) Range for Vehicle	Detection : Place vehicle at a distance of 5	an ann an an Anna an A Anna an Anna an
	Detection : 5 Km (min).	Km. HHTI should detect the movement of (broad side) of vehicle	Vehicle detection and recognition through
	Recognition : 2.5 Km (min)	Recognition: Place vehicle at a distance of	······································
	Note: Vehicle dimension minimum 4010 x 1540 x 1875	2.5 Km. HHTI should recognize the type of vehicle.	
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	mm (LxBxH)		
	1) DAY CAMERA : (Optional to be	specified by the user department)	
	a. Colour Camera	Put the HHTI in normal mode so that only day camera image is displayed on the screen.	Must be Colour Camera
	b. Resolution : 754 X 576 (Min) or better	Firm has to submit National /International accredited Lab certificate. If no such lab available in India then , firm has to submit Indian Govt Lab /OEM certificate in respect of the same.	Resolution of camera must be 754 X 576 (Min) or better
	c. Optical zoom : 5x (min) or better continuous	To be physically check by the BOO. Check the optical zoom physically in the lab as per the procedure.	Optical zoom must be 5x continuous (min) or better
0	d. Digital Zoom : 4x or better	Check the digital zoom physically in the lab as per the procedure.	Digital Zoom must be 4x or better
	e. Auto Focus/ Manual	Check the focusing mechanism provided for automatic and manual focusing.	System must be Auto /Manual Focus.
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	2) Range : Day Camera :		
	a) Range for human target Detection : 4 Km(min).	Detection : Move group of 03 persons at a distance of 4 Km. Day camera should detect the movement.	Detection, recognition and identification through Day Camera must be achieved as per para-4 (2) (a)
	Recognition : 2 Km(min).	Recognition : Move group of 03 persons at a distance of 2 Km. Day camera should detect the Nos of persons with or without weapon (Rifle).	
	Identification : 1 Km.(min).	Identification : Move group of 03 persons in different color uniform / dress with Rifle. Day camera should identify the presence of men with the colour of uniform / dress with rifle.	
	b) Range for Vehicle Detection : 6Km (min).	Detection : Place medium Vehicle at distance of 6 Km. Day camera should detect the presence of moving vehicle (broad side).	Vehicle detection, recognition and identification through Day Camera must be achieved as per para-4 (2) (b)
	Recognition : 3 Km (min)	Recognition : Place medium Vehicle at a distance of 3 Km. Day camera should recognize the type and class of vehicle.	
	Identification : 1.5 Km.(min).	Identification : Place medium Vehicle at a distance of 1.5 Km. Day camera should identify type and class of vehicle with colour	
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Sec. 1	(A) HHTI (Used as Handheld or on	tripod)	
	a) Inter Pupillary Distance (IPD) : Adjustable	To be physically checked by the BOO	System must have adjustable Inter Pupillary Distance (IPD)
	b) Internal display : Advance high resolution OLED display having resolution 640 x 480 or better.	Firm has to submit National /International accredited Lab certificate. If no such lab available in India then , firm has to submit any Indian Govt Lab/OEM certificate in respect of the same	System must have advance high resolution OLED internal display of resolution 640 x 480 or better.
	(B) HHTI TO BE INTEGRATED WIT	TH CIBMS	
	a)Eye Piece assembly and internal display are not required.	To be physically checked by the BOO	Not required
6.	Operating temp Range : a) -20 degree to +55 degree centigrade or better	Check the National/International Accredited lab certificate/report submitted by the firm in respect of operating Temp. BOO will also physically check in different climatic condition in the field (i.e. cold as well as hot)	The firm should provide National/International Accredited lab certificate/report in respect of temperature range of para 6 (a) & (b) . In case any doubt in the test report the veracity of the same may be checked from
	Storage temp Range : b) -30 degree to +60 degree centigrade or better	Check the National/International Accredited lab certificate/report submitted by the firm in respect of operating Temp.	the concerned lab. System must be work in different climatic condition in the field (i.e cold as well as hot)
7.	Network Connectivity : (Optional	-to be specified by the user department)	
	a) Ability to integrate with available IP Network through Ethernet with Video streaming and Video recording.	To be physically checked by BOO for integration with available IP Network through Ethernet with Video streaming & Video recording.	Must be able to integrate with available IP network through Ethernet with Video streaming and Video recording
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	b) Firm should be able to integrate HHTI with third party C2. Firm should also be able to provide SDK /API and interface protocol for integration with third party C2, so that it can work in slew to cue mode with Radar / UGS etc.	integration with third party C2.	third party C2. Firm should also be able to provide SDK /API and interface protocol for integration with third party C2.
	c) Major functions of the system including ON & OFF be operable through C2 system.	 To be physically checked by BOO a. Focusing. b. field of view. c. Black HOT/WHITE HOT. d. zoom. (Optical / electronics). e. Power ON / OFF. 	Major functions of the system must be operable through C2 system.
8.	OPERATOR CONSOLE UNIT : (Opt	ional- to be specified by the user department	t)
	a. This must be comprising of a ruggedized LCD color display of size 15 inch (min).	To be physically check by the BOO. Firm has to submit National /International accredited Lab certificate. If no such lab available in India then , firm has to submit any Indian Govt Lab / OEM certificate in respect the same.	System must be comprising of a ruggedized LCD color display of size 15 inch (min).
	b. The console unit should have the facility to show the map in the background correlated with the video of the camera. (In case system is provided with the GPS).	Check the correlation between captured video with background map by uploading the map in Console unit.	The console unit must have the facility to show the map in the background correlated with the video of the camera. (In case system is provided with the GPS).
	c. A suitable provision of the control keys or joystick should be provided to operate the system remotely with comfort.	Install the HHTI with Console and check the system functions through console remotely.	A suitable provision of the control keys or joystick should be provided to operate the system remotely with comfort.
V	d. The console should have recovery option in the system itself	Check the console for the provision of system recovery facility and also check the	The console must have recovery option in the system itself whenever software gets
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5	whenever software gets corrupted.	assurance certificate in respect of the same	corrupted.
	e. The console should have the provision to control the operation of day & night camera and Pan & Tilt system.	Repeat the procedure suggested at para 8(c) and check the function of cameras and Pan & Tilt sub systems.	The console must have the provision to control the operation of day & night camera and Pan & Tilt system .
	f. The console should have scan around facility and automatically scan the operator defined sector whenever required. (In case system has integrated with DMC).	Check the system for automatic scan around facility.	The console must have scan around facility and automatically scan the operator defined sector whenever required. (In case system has integrated with DMC).
	g. The console must incorporate built in test equipment (BITE)	Check the system for BITE facility physically.	The console must have built in test equipment (BITE).
	h. Should have ports for external PC interface, Ethernet , digital & analogue video out.	Check the system for External PC interface, Ethernet and digital & analogue video out- put ports.	System must have ports for external PC interface, Ethernet , digital & analogue video out.
	i. Console should have suitable power adaptor.	To be physically checked by BOO.	Suitable power adaptor must be provided.
	j. Video Recording Capability (Optional- to be specified by the user department)Advanced inbuilt storage memory of 1TB (min) exclusively to store the video should be provided in the console. The system should have facility to retrieve the stored data.	Check the inbuilt storage memory exclusively to store the video in the console. Check the Console for the facility to retrieve the storage data.	Video Recording Capability advanced inbuilt storage memory of 1TB (min) exclusively to store the video must be provided in the console. The system must have facility to retrieve the stored data.
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9.	PAN & TILT MECHANISM :(Optional- to be specified by the user department)High precision motorized pan and	Physically check the Pan & Tilt mechanism for variable speed facility precisely through console.	System must have PAN & TILT mechanism as per para 9 (a) & (b).
	tilt unit with variable speed facility.	Check the azimuth movement of 360° with variable speed 1° to 40°/sec.	
112	 a)Azimuth (Pan) for 360° with variable speed 1° to 40°/Sec. b)Elevation (Tilt) for + 25° (Min) & -45°(Min) with variable speed of 1° to 15°/Sec . 	Check the elevation(Tilt) movement for + 25° (Min) & -45°(Min) with variable speed of 1° to 15°/Sec	
10	Remote Surveillance Facility : (O)	ptional- to be specified by the user departme	ent)
	 a) Console should be able to operate and control the equipment through wire (100 meters minimum) b) To stream imagery over wireless link (500 meters minimum NLOS and 5000 meters minimum LOS with encryption). 	 a) Install the HHTI & console with wire remotely and distance between them should be 100 meters minimum. Check the operation of HHTI through console. b) Install the wireless transmitter at HHTI end and receive the video at console at 5000 meters from HHTI in LOS. Again receive the video at 500 meters away from HHTI in NLOS i.e. behind a mountain or obstacles. 	System must have provided remote surveillance facility as per para 10(a) & (b).
	 Digital Magnetic Compass (DMC) : (Optional- to be specified by the user department) Inbuilt DMC should be provided. 	Note down the bearing of a point with the help of compass. Again check the bearing of that point through inbuilt DMC and then	Inbuilt DMC must be provided.
	for auto Northing.	compare both the readings for accuracy.	
,	Accuracy should be $\leq 1^{\circ}$.		
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	Inbuilt GPS to provide own position during initialization. It should give co-ordinates in Lat- Long and Indian Military GR system. Accuracy should be 05 meters (Maximum).	Switch 'ON' the HHTI and co-ordinates of own position through inbuilt GPS. Check the own position co-ordinates of a point by other GPS and compare it with the co-ordinates of the same point shown by the inbuilt GPS.	Inbuilt GPS to provide own position during initialization. It should give co-ordinates in Lat-Long and Indian Military GR system. Accuracy should be 05 meters (Max).
13.	In built Laser Range Finder : (Optional- to be specified by the user department) In built LRF (class 1 eye safe) should be provided for finding range of any target/object upto 6000 meters or better with accuracy of ± 5 Mtrs or better.	To be physically checked by BOO. To check the LRF the target size will be medium vehicle size (4010 X 1540 X 1875 mm) park side ways. Firm has to submit National /International accredited Lab certificate. If no such lab available in India, then , firm has to submit any Indian Govt Lab / OEM certificate in respect of class 1 eye safe.	In built LRF (class 1 eye safe) must be provided for finding range of any target/object upto 6000 meters or better with accuracy of ± 5 Mtrs or better.
14	POWER SOURCE: It should Function on 110 volt to 270 volt, 50 Hz AC mains through AC/DC Adopter or UPS with Stabilizer. UPS backup with 30 Minutes only for CIBMS compliant system.	Connect the AC/DC adopter on 50 Hz variable AC mains supply and check the output voltage by varying the in-put voltage from 110 to 270 volts. Bty backup of UPS for 30 Minutes to be checked physically.	It must function on 110 volt to 270 volt, 50 Hz AC mains through AC/DC Adopter or UPS with Stabilizer. UPS backup with 30 Minutes only for CIBMS compliant system.
	FOR HHTI IN HAND HELD ROLE O	DNLY :-	
S	(i) Battery : Should have rechargeable Lithium-ion/Lithium polymer battery or better to operate the system. Battery charge indication	To be physically checked by the BOO Check the battery provided for operating the system for its type and recharge ability. Check the battery for the battery status	The system must be operated with rechargeable Lithium-ion/Lithium polymer battery. Battery charge indication must be provided on screen.
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		should be on screen.	indication on screen			
		(ii) Battery performance : The battery(s) should be able to run the system for 3 hours or more in operation mode on single charge.	To be physically checked by the BOO Operate the system with fully charged rechargeable battery(s) and put it in the operation mode. Start the counting of functional hours in stop watch.	Rechargeable battery(s) must run the system for 3 hrs or more in operational mode on single charge.		
		(iii) Spare batteries : For additional cycle of operation, 03 spare batteries be provided.	Undertaking be given by the firm.	System must be provided with 3 spare batteries.		
		iv) Battery charger : A smart and intelligent, universal charger for charging the battery from 110 volt to 270 volts 50 Hz AC mains along with DC charging facility from 12 volt to 48 volt DC (on entire range) should be provided. It should have "charge on" and "charge complete" indications during the charging of battery. The charger should be capable to charge the battery fully in ≤ 5 hours.	To be physically checked by the BOO Switch 'ON' the charger on 50 Hz variable AC mains supply and check the out-put voltage by varying the in-put voltage from 110 to 270 volts. Again switch 'ON' the charger on variable DC power supply and check the out-put voltage by varying the in-put voltage from 12 to 48 volts. Check the charger for 'Charge ON' and charge complete indications. Charge a fully discharged battery with the charger and note down the total time to fully charge the battery.	system must be equipped with battery Charger with all parameters as specified in para 14 (iv).		
	15.	Miscellaneous :-				
Λ	0	1. User Manual	Physically checked by the BOO.	User manual must be provided.		
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		2. Operation Manual/technical Manual - Detailed operators instructions, Technical literature, Maintenance manual, inspection standards be provided with the equipment	Physically checked by the BOO.	Operation Manual/technical Manual - Detailed operators instructions, Technical literature, Maintenance manual and inspection standards must be provided with the equipment.
		3. All the optional modules i.e. day camera, LRF, GPS, DMC, whichever specified by the user department, should be provide in a single housing	Physically checked by the BOO.	All optional module i.e. day camera, LRF, GPS, DMC, whichever specified by the user department must be provide in a single housing.
		 4. Engineering support : a) Adequate number of spares including IR Sensor, Modules used (10% of total Nos of EO Sensors) etc. b) Test Station with Test Equipment for repair & maintenance of the system (Base workshop level). c) HHTI (Hand Held) should be upgradable to be made part of CIBMS, if need be. d) OEM to submit rate list of all spare parts along with their blue print. 	An undertaking in this regard will be obtained from the firm.	Engineering support as para 15 (4) (a to d) must be provided .
	16.	Training :		
Λ		a) Base Workshop level training to minimum 10 technicians at OEM premises on full fledged running testing, diagnostic and calibration set up.	An undertaking in this regard will be obtained from the firm.	
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15 An undertaking in this regard will be Training as specified must be provided. training obtained from the firm b) Operator level should be imparted to 02 persons @ each system. Zajunas (Dhananjay Mishra), 7.3.19 (Brij Kishor) (Ashok Kumar Sharma) (Rajnish Kumar), PSO (E) Sc 'E', DRDO ADG (Log) BSF Comdt, SIW BSF BPR&D (Rampal Yadav), DC -AP Singh), DC (Suresh Kumar), Sqn Cdr (Naresh Kumar), Dy. Director ITBP SIW, BSF 52 SAG, NSG DCPW MIKYadav 513/19 (Insp/E Rajeev Dahiya), (ASI/RM Mukesh Kr Yadav) (WO/RM R S Dhaka) (Nb/Sub Bahadur Chand) CISF BSF Assam Rifle Assam Rifle

APPROVED/ NOT APPROVED

1-9/4/19

(Rajni Kant Mishra) IPS DIRECTOR GENERAL BORDER SECURITY FORCE