Draft QRs/TDs of Weapon Based Single Channel TI Sight for 7.62 LMG/MMG (Un-cooled)

Central Industrial Security Force has formulated the Qualitative Requirements and Trial Directives of Weapon Based Single Channel Thermal Imaging Sight for 7.62 mm LMG/MMG (Un-cooled Version) by convening the meeting of Sub-Group of Technical Experts. The said draft QRs and TDs is enclosed as per Appendix-A & B respectively.

Firms/Vendors may send their comments/objections/suggestions with full justification within 15 days through email at **aigord@cisf.gov.in** or registered post or both at the following address:

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(K K Chaturvedi)
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Appendix-A

Draft QRs for Weapon Based Single Channel Thermal Imaging Sight for 7.62 mm LMG/MMG (Un-Cooled Version)

S.N.	Parameter	Specification
1	Ergonomics	Should be compact, Monocular, Easy to mount and quickly deployable on 7.62mm LMG/MMG
2	**Operational requirement**	a) Should have capability to produce real time video feed on eye piece as well as on external device.
		b) Should be rugged for operations as per JSS 55555/810 F MIL STD in respect of High & Low Temperature, humidity, shock, vibration, bump and rain test.
		c) Should be IP 67 compliant or better.
		d) Should be capable to see through darkness, haze and smoke.
	i) Exposure to sun light	Should not get damaged if faced towards sun accidentally/momentarily.
	ii) Exposure to glare of searchlights.	It should be immune to glare of searchlights system.
	iii)Weight : a) 7.62 mm LMG b) 7.62mm MMG	a) 1.6 Kg or less with Battery/Cells, OG Cap, Eye guard & mounting adaptor for 7.62 mm LMG. b) 2 Kg or less with Battery/Cells, OG Cap, Eyeguard & mounting adaptor for 7.62mm MMG.
	iv) Storage Case:	A ruggedized shock proof container compliant to IP-67 or better /Mil Std 810 F or better for transportation. An additional rain proof soft carrying case compliant to IP 65 with shoulder strap be provided
3	TECHNICAL SPECIFICATION:	
	a) FPA resolution :	640 x 480 or better.
	b) Spectral range :	8-14 µm or better.
	c) Field of view :	6^0 x 4^0 (Minimum)
	d) Magnification : Digital Zoom/E-zoom	4x or better
	e) ON/OFF switch	TI Sight should have ON/OFF switch for operating. Ready time from power off mode : Within 30 seconds
	f) Reticule :	i) Fine Cross hair with centre dot. The reticule pattern should provide the scale of different range i.e. 100, 200, 400 & 600 meter for 7.62 mm LMG. ii) Fine Cross hair with centre dot. The reticule pattern should provide the scale of different range i.e. 200,600,1000,1400 & 1800 meters for 7.62 mm MMG.
	g) Adjustment and zeroing :	There should be a facility of Azimuth & Elevation adjustment in steps of 1 MOA
	h) Focus :	10 mtr to infinity (Auto focus)
	i) Non Uniformity Correction (NUC).	It should be compliant for Non Uniformity Correction (NUC).
	j) Polarity	Black Hot and white Hot
	k) Diopter adjustment :	+4 to - 4 or better
	l) Internal display :	Advance high resolution OLED display having resolution 640 x 480 or better

S.N.	Parameter	Specification
	m) Eye Relief :	25 mm (min)
	n) Image capturing and video recording:	System should have the facility to record and to retrieve the stored data.
	o) Memory :	32 GB (Min)
4	**Functional Requirement**	
	a) Range: 7.62 mm LMG	Human Detection: 1 Km.(Min) Recognition :800 Mtrs.(Min)
	b) Range: 7.62 mm MMG	Human Detection: 1.5 K.M (Min) Recognition:1 K.M (Min)
5	Operating temp Range :	-20 degree to +55 degree centigrade
	Storage temp Range:	-30 degree to +70 degree centigrade.
6	Pica tinny Rail :	A standard Pica tinny Rail/ Suitable adaptor should be provided to mount the sight on the weapon as specified by the indenter/user. It should remain zeroed even after fire of minimum 100 rounds.
7	Sight locking Mechanism:	The Sight should have stable locking mechanism for quick attachment and detachment with weapon.
8	Weapon Mounting Adaptor :	Suitable weapon mounting adaptor should be provided with each sight to enable mounting on 7.62 mm MMG/LMG.
9	Accuracy and consistency: i) 7.62 mm LMG ii) 7.62 mm MMG	i) 90% or more hits when 20 rounds are fired at 200 mtrs. Also achieve max group size of 12 cm when 5 rounds are fired in single shot deliberate fire mode on 4x4targetat 200 mtrswith 7.62 LMG. ii) 90% or more hits when 20 rounds are fired at 800 mtrs on 4x4target with 7.62 MMG.
10	**POWER SOURCE:**	
	(i)Battery :	Should have rechargeable commercially available Lithium-ion/Lithium polymer battery or better to operate the system. Battery status indication should be on screen.
	(ii)Battery performance :	The battery(s) should be able to run the system for 6 hours or more in operation mode on single charge.
	(iii) Spare batteries :	For additional cycle of operation, 02 set spare battery/cell be provided.
	(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 $\leq$ 5 hours.
11	**Miscellaneous:-**	
	1.User Manual	User manual should be provided in English/Hindi.
	2.Operation Manual/ Technical Manual (English/Hindi)	Detailed operating instructions, Technical literature, Maintenance manual, inspection standards should be provided.

S.N.	Parameter	Specification
	3.Warranty:	Min. 03 years & shelf life min 10 years/10000 hrs.
	4.Test Station with Test Equipment for repair &maintenance of the system (Base workshop level).	User to specify.
	5. Engineering support :	a) Adequate number of spares including IR Sensor, Modules used (10% of total Nos of TI Sight) etc. b) OEM to submit rate list of all spare parts along with their blue print.
12	Training	a) Base Workshop level training to minimum 05technicians at OEM premises on full fledged running, testing, diagnostic and calibration set up.
		b) Operator level training should be imparted to 50 personnel

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Appendix-B

Draft TDs for Weapon Based Single Channel Thermal Imaging Sight for 7.62 mm LMG/MMG (Un-Cooled Version)

S.N.	Parameter	Specification	Trial Directives
1	Ergonomics	Should be compact, Monocular, Easy to mount and quickly deployable on 7.62mm LMG/MMG	To be physically checked by board of officers.
2	**Operational requirement**	a) Should have capability to produce real time video feed on eye piece as well as on external device.	To be physically checked by board of officers.It shouldproduce real time video feed on Eye piece as well as on external device.
		b) Should be rugged for operations as per JSS 55555/810 F MIL STD in respect of High & Low Temperature, humidity, shock, vibration, bump and rain test. c) Should be IP 67 compliant or better.	Firm should submit National (NABL)/International Accredited Lab Certificate. The board of officers should check the certificate for authenticity. In addition the Board will also physically check: The sight should be submerged into 01 mtr depth of water for 30 minutesafter which it should work. There should not be ingress of water inside the battery housing and optical parts of the equipment.
		d) Should be capable to see through darkness, haze and smoke.	To be physically checked by board of officers. Switch on the system in different conditions like full dark night, haze and smoke and observe the image through eye piece. For creating the smoke condition BOO should use smoke candles. Sensor should work in all conditions.
	i) Exposure to sun light	Should not get damaged if faced towards sun accidentally/momentarily.	To be physically checked by board of officers. Switch on the system and direct towards the sun for 5 seconds. After this, system should work properly.It should not get damaged if faced towards sun.
	ii) Exposure to glare of searchlights.	It should be immune to glare of searchlights system.	To be physically checked by board of officers Switch on the searchlight and throw its beam towards Sight in operational mode for 5 seconds. After this, system should work properly.
	iii)Weight : a) 7.62 mm LMG b) 7.62mm MMG	a) 1.6 Kg or less with Battery/Cells, OG Cap, Eye guard & mounting adaptor for 7.62 mm LMG. b) 2 Kg or less with Battery/Cells, OG Cap, Eyeguard& mounting adaptor for 7.62mm MMG.	To be physically checked by board of officers.

S.N.	Parameter	Specification	Trial Directives
	iv) Storage Case:	A ruggedized shock proof container compliant to IP-67 or better /Mil Std 810 F or better for transportation. An additional rain proof soft carrying case compliant to IP 65 with shoulder strap be provided	The Firm should submit National (NABL)/International accredited Lab Test report/certificate in respect of ruggedized shock proof storage case.The board of officers should check the certificate. The storage case should be made to submerge into 01 mtr depth of water for 30 minutes after which it should be work. There should not be ingress of water inside the storage case. In addition drop test should be done by dropping the container with equipment & all accessories from a specified height as per standard on a hard surface.
3	**TECHNICAL SPECIFICATION:**		
	a) FPA resolution :	640 x 480 or better.	The firm should submit the OEM certificate. The board of officers should check the OEM certificate supporting the specified parameters.
	b) Spectral range :	8-14 μm or better.	The firm should submit the OEM certificate. The board of officers should check the OEM certificate supporting the specified parameters.
	c) Field of view :	6^0 x 4^0 (Minimum)	The firm should submit the OEM certificate. The board of officers should check the OEM certificate supporting the specified parameters. The equipment will also be tested in SIW BSF (Acceptance Test Station). The test result should be as per specification.
	d) Magnification : Digital Zoom/E-zoom	4x or better	The firm should submit the OEM certificate. The board of officers should check the OEM certificate supporting the specified parameters. The equipment will also be tested in SIW BSF (Acceptance Test Station). The test result should be as per specification.
	e) ON/OFF switch	TI Sight should have ON/OFF switch for operating. Ready time from power off mode : Within 30 seconds	To be physically checked by board of officers. The equipment will be switched ON from OFF mode to operational mode.

S.N.	Parameter	Specification	Trial Directives
	f) Reticule :	i) Fine Cross hair with centre dot. The reticule pattern should provide the scale of different range i.e. 100, 200, 400 & 600 meter for 7.62 mm LMG. ii) Fine Cross hair with centre dot. The reticule pattern should provide the scale of different range i.e. 200,600,1000,1400 & 1800 meters for 7.62 mm MMG.	To be physically checked by board of officers for different ranges on the equipment on ground to verify the same.
	g) Adjustment and zeroing :	There should be a facility of Azimuth & Elevation adjustment in steps of 1 MOA	To be physically checked by board of officers.
	h) Focus :	10 mtr to infinity (Auto focus)	To be physically checked by board of officers. The system should be able to auto focus on particular targets from 10 mtrs to infinity.
	i) Non Uniformity Correction (NUC).	It should be compliant for Non Uniformity Correction (NUC).	The firm should submit the OEM certificate. The board of officers should check the OEM certificate supporting the specified parameters.
	j) Polarity	Black Hot and white Hot	To be physically checked by board of officers.
	k) Diopter adjustment :	+4 to - 4 or better	To be physically checked by board of officers. Measure the Diopter adjustment limits with the help of Diopter measuring apparatus in the Lab of SIW/BSF.
	l) Internal display :	Advance high resolution OLED display having resolution 640 x 480 or better	The firm should submit the National (NABL)/International Accredited Lab Certificate. The board of officers should check the certificate supporting the specified parameters.
	m) Eye Relief :	25 mm (min)	To be physically checked by board of officers. Measure the distance of observer's eye to eye piece of the device.
	n) Image capturing and video recording:	System should have the facility to record and to retrieve the stored data.	To be physically checked by board of officers.
	o) Memory :	32 GB (Min)	To be physically checked by board of officers.

S.N.	Parameter	Specification	Trial Directives
4	**Functional Requirement**		
	a) Range: 7.62 mm LMG	Human Detection: 1 Km.(Min) Recognition :800 Mtrs.(Min)	To be physically checked by board of officers. **Detection :** Move a group of 03 persons at a distance of 1 Km. TI Sight should detect the movement. **Recognition** : Move a group of 03 persons in camouflage uniform from a range of 800 Mtrs with both hands up & down movement towards the TI Sight. The movement of persons with both hands up & down should be recognized at a range of 800 Mtrs.
	b) Range: 7.62 mm MMG	Human Detection: 1.5 K.M (Min) Recognition:1 K.M (Min)	To be physically checked by board of officers. **Detection :** Move a group of 03 persons at a distance of 1.5 K.M. TI Sight should detect the movement. **Recognition** : Move a group of 03 persons in camouflage uniform from a range of 1 K.M with both hands up & down movement towards the TI Sight. The movement of persons with both hands up & down should be recognized at a range of 1 K.M.
5	Operating temp Range :	-20 degree to +55 degree centigrade	The firm should submit the National (NABL) /International Accredited lab certificate/report. The board of officers should check the certificate supporting the specified parameters.
	Storage temp Range:	-30 degree to +70 degree centigrade.	The firm should submit the National (NABL) /International Accredited lab certificate/report. The board of officers should check the certificate supporting the specified parameters.
6	Pica tinny Rail :	A standard Pica tinny Rail/ Suitable adaptor should be provided to mount the sight on the weapon as specified by the indenter/user. It should remain zeroed even after fire of minimum 100 rounds.	To be physically checked by board of officers. Check the adaptor provided and its compatibility with the weapon specified by the user. Mount the sight on 7.62 mm LMG/MMG and zero the sight with the weapons. Fire 100 rounds as per the procedure and check the zeroing again.

S.N.	Parameter	Specification	Trial Directives
7	Sight locking Mechanism:	The Sight should have stable locking mechanism for quick attachment and detachment with weapon.	To be physically checked by board of officers. a) Mount the sight on LMG/MMG and lock the mechanism with lever. b) Check the sight locking mechanism for quick attachment and detachment with the weapon. Check the stability of the lever locking mechanism during test firing of 100 rounds.
8	Weapon Mounting Adaptor :	Suitable weapon mounting adaptor should be provided with each sight to enable mounting on 7.62 mm MMG/LMG.	To be physically checked by board of officers.
9	Accuracy and consistency: i) 7.62 mm LMG ii) 7.62 mm MMG	i) 90% or more hits when 20 rounds are fired at 200 mtrs. Also achieve max group size of 12 cm when 5 rounds are fired in single shot deliberate fire mode on 4x4targetat 200 mtrswith 7.62 LMG. ii) 90% or more hits when 20 rounds are fired at 800 mtrs on 4x4target with 7.62 MMG.	To be physically checked by board of officers.
10	**POWER SOURCE:**		
	(i)Battery :	Should have rechargeable commercially available Lithium-ion/Lithium polymer battery or better to operate the system. Battery status indication should be on screen.	To be physically checked by board of officers.
	(ii)Battery performance :	The battery(s) should be able to run the system for 6 hours or more in operation mode on single charge.	To be physically checked by board of officers.
	(iii) Spare batteries :	For additional cycle of operation, 02 set spare battery/cell be provided.	The firm should submit the undertaking for the same and the board of officers should check the undertaking.
	(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 $\leq$ 5 hours.	To be physically checked by board of officers. 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.

S.N	Parameter	Specification	Trial Directives
11	**Miscellaneous:-**		
	1.User Manual	User manual should be provided in English/Hindi.	To be physically checked by board of officers.
	2.Operation Manual/ Technical Manual (English/Hindi)	Detailed operating instructions, Technical literature, Maintenance manual, inspection standards should be provided.	To be physically checked by board of officers.
	3.Warranty:	Min. 03 years & shelf life min 10 years/10000 hrs.	The firm should submit the undertaking and the board of officers should check the warranty clause on the basis of undertaking.
	4.Test Station with Test Equipment for repair &maintenance of the system (Base workshop level).	User to specify.	User to specify.
	5. Engineering support :	a) Adequate number of spares including IR Sensor, Modules used (10% of total Nos of TI Sight) etc. b) OEM to submit rate list of all spare parts along with their blue print.	The firm should submit the undertaking for the same.
12	**Training :**	a) Base Workshop level training to minimum 05technicians at OEM premises on full fledged running, testing, diagnostic and calibration set up.	The firm should submit an undertaking in this regard. The board of officers should check the undertaking to impart training as specified.
		b) Operator level training should be imparted to 50 personnel.	The firm should submit an undertaking in this regard. The board of officers should check the undertaking to impart training as specified.

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