

NO. B.V-7/2013-14-C(QRS)-(1) - 9904

भारत सरकार/Government of India

गृह मंत्रालय/Ministry of Home Affairs

पुलिस आधुनिकीकरण प्रभाग /Police Modernization Division

संभरण-I डेस्क /Prov.I Desk

26, Man Singh Road, Jaisalmer House
New Delhi, the 24 December, 2014

To,

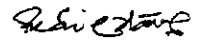
DsG : AR (through LOAR), BSF, CISE, CRPF, ITBP, SSB, NSG & BPR&D.

Subject: QRs and Trial Directives of Basic Verification Kit for Trouble Shooting of Optical Fiber Cabling System.

The QRs and Trial Directives of Basic Verification Kit for Trouble Shooting of Optical Fiber Cabling System as per Annex-I and Annex-II respectively have been accepted by the Competent Authority in MHA.

2. Concerned CAPF will be accountable for correctness of the QRs and TDS.
3. Henceforth, all the CAPFs should procure the above item required by them strictly as per the laid down QRs.

Yours faithfully,



(P. K. Srivastava)

Under Secretary to the Govt. of India

Tel : 23381278

Encl: As above. ✓

Copy forwarded to SO (IT), MHA, with the request to host the QRs and Trial Directives of Tactical Ladder Launcher on the website of MHA (under the page Organizational Set up-Police Modernization Division-Qualitative Requirements – Communication Equipment), soft copy is being sent through email.



(R K Soni)

Section Officer (Prov.I)

Copy to: DDG(Procurement), MHA.

QRs/ SPECIFICATION OF BASIC VERIFICATION KIT FOR TROUBLE SHOOTING OF OPTICAL FIBER CABLING SYSTEM

| Sl. No | SPECIFICATIONS |
|--------|---|
| 1 | <p>General: The Kit should be able to measure optical power loss at both 1310 nm and 1550 nm simultaneously and save records for two wavelengths on one report. The kit should have following i.e Optical Power Meter, Visual Fault Locator, Optical light source, Fiber Inspector, Fiber Cleaning Kit with assys.</p> |
| 2 | <p>Optical Power Meter</p> <p>a) The power meter should have the ability to save a reference power level, allowing a direct display of fiber loss. Power meter should be ruggedly built for demanding field use and to survive drops, vibrations and impacts.</p> <p>b) Power meter should have universal push pull connector adapters for simple network connection with 1.25mm & 2.5mm connectors available.</p> <p>c) The optical power meter shall auto-sense the source wavelength</p> <p>d) Calibrated wave lengths: 1310nm & 1550nm.</p> <p>e) Auto power off option : about 20 minutes</p> <p>f) Detector type : InGaAs or Ge</p> <p>g) Power Meter range :+10 to -60dB or better</p> <p>h) Accuracy : ±0.20 dB</p> <p>i) Resolution : 0.01 dB</p> <p>j) Tone Detection : 270Hz, 1Khz, 2Khz</p> <p>k) Operating Temperature range : -10°C to 50°C or better</p> <p>l) Should be able to Display power in dBm, mW & µW</p> <p>m) Result management software should be supplied with the kit to download and manage the results on a PC/Laptop and Should be able to save 100 results or more.</p> |
| 3 | <p>Optical Light Source</p> <p>i) General: Handheld optical source single mode (1310nm and 1550nm) should have dual wavelength on single port with auto wavelength functionality.</p> <p>ii) Optical source should be ruggedly built for demanding field use and to survives drops, vibrations and impacts</p> <p>iii) Laser source should incorporate interchangeable connector adapters for simple network connection. Preferably it should be SC</p> <p>iv) Tone Generation : 270Hz, 1Khz, 2Khz</p> <p>v) Source type : Laser</p> <p>Optical source should have the following specifications:</p> <p>vi) Operating Temperature range : -10 to 50° C or better</p> <p>vii) Certifications: CE, Class 1 laser.</p> <p>viii) Laser power output : -7 dBm</p> <p>ix) Power Measurement Linearity:-0.1 dB</p> <p>x) Should be able to Display power in dBm, mW & µW</p> <p>xi) Battery Operated: 2 AA alkaline batteries with minimum 50 hours life on both Power source & Power Meter.</p> |
| 4 | <p>Visual Fault Locator</p> <p>a) General: The Visual Fault Locator is a hand-held tool that helps to diagnose and repair simple fiber link problems. It emits a bright beam of red light easily visible from a distance. Thus it performs simple end-to-end continuity checks. The tool will have ability to quickly illuminate fiber breaks, defective splices in splice trays, and tight fiber bends in and around equipment racks.</p> <p>b) Fiber Compatibility : Multimode and Single mode Fiber</p> <p>c) Wave Length : 650 nm ±25nm (Visible wave length)</p> <p>d) Source type : Laser</p> |

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- e) Laser Safety rating : Class II
- f) Output power : 1.0 m W max.
- g) Operation mode : Continuous (steady) and flashing
- h) Range : At least 3 km for multimode, 4 km for single mode or better
- i) Adapter: 2.5mm universal (SC, ST, FC) connectors and 1.25mm universal (LC, MU) connectors.
- j) Battery : 2xAA alkaline batteries
- k) Battery life : => 30 hours or better in continuous mode

5 **Fiber Inspector**

- a) Digital Fiber Inspector video probe camera shall provide high resolution magnification 200x & 400x or better end face images of both multi mode and single mode end-faces inside ports and on patch cords.
- b) Display: 1.8 in (46cm) screen or better
- c) Should support various probe adapter tips for inspection through many different connector port types
- d) Should have automatic pass/fail function as per IEC 61300 standard
- e) Certification : CE
- f) Easily connectable with OTDR .
- g) Power source : Rechargeable NiMH or Li-ion battery or ac power with adpoter or USB port
- h) The handheld test kit should house all the items mentioned in srl no (2,3 , 4 & 5) and to be supplied in a professional and durable case.

6 **Fiber Cleaning Kit**

- a) The cleaning kit will have tools to effectively remove contaminants from fibre connectors, fibre ports. All cleaning materials must be lint-free and enable an optimal wet and dry cleaning process. The kit should have rugged carrying case for carrying and strong cleaning components. The kit should have detailed cleaning instruction.
- b) There should be additional storage space for patch cords, adapters etc.
- The kit should consist of :-**
 - i. Industrial standard fiber solvent to clean the fiber –for cleaning 100 connectors.
 - ii. Lint free Fiber optic cleaning paper/cube /cards – for cleaning 100 connectors.
 - iii. Lint free Fiber optic solvent swabs – 100 nos.
 - iv. Should have cleaner for 1.25mm and 2.5mm connector- 100 nos
 - v. Should have automatic cleaning instrument for dirty port by one click – 5 nos.
- c) Fiber cleaning kit should be in a separate professional and durable case and should have enough space to housed above mentioned items from srl no 6(a) to (c)

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Approved/ Not Approved

(Pranay Sahay, IPS)
DG, CRPF

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TRIAL DIRECTIVE/TESTING METHODOLOGY FOR BASIC VERIFICATION KIT FOR TROUBLE SHOOTING OF OPTICAL FIBRE CABLING SYSTEM

Trial of equipment will be conducted by a Board of Officers in the presence of Vendor or representative of Vendor/Firms to assessed the actual performance of the equipment.

2) All parameter / Specifications mentioned in the QRs will be checked by board of officers by ascertaining /verifying following checks.

Physical Checks: In this category specifications of the equipment will be checked physically as per QRs.

Functional Check:- The vendors will show all features/ configuration of the equipment to the board of officers during technical evaluation.

Submission of certificates :- Specification which can not be checked due to lack of testing facilities/ expertise, a certificate of test shown against each will be provided by vendor/firm during physical trial of the equipment under trial.

| Sl No | SPECIFICATIONS | Trial/ Testing methodology |
|-------|---|--|
| 1 | General: The Kit should be able to measure optical power loss at both 1310 nm and 1550 nm simultaneously and save records for two wavelengths on one report. The kit should have following i.e Optical Power Meter, Visual Fault Locator, Optical light source, Fiber Inspector, Fiber Cleaning Kit with assys. | Physical check and firm rep. to shown the parameters by practically to B.O.O |
| 2 | Optical Power Meter | |
| | a) The power meter should have the ability to save a reference power level, allowing a direct display of fiber loss. Power meter should be ruggedly built for demanding field use and to survive drops, vibrations and impacts | Functional Test : Switch on the power meter to check display and connect power meter to power source with test patch cord to set reference. OEM certificate should be provided for ruggedly built and to survives drops, vibrations and impacts. |
| | b) Power meter should have universal push pull connector adapters for simple network connection with 1.25mm & 2.5mm connectors available. | Physical Check by connecting both LC & SC adapters to verify the same. |
| | c) The optical power meter shall auto-sense the source wavelength | Connect power meter to the active source and check the current wavelength |
| | d) Calibrated wave lengths: 1310nm & 1550nm. | OEM Certificate or Test certificate of any Government/Govt approved/international accredited laboratory to be produced by supplier. |
| | e) Auto power off option about 20 minutes | Functional check by keeping the equipment idle for 20 minutes. |
| | f) Detector type : InGaAs or Ge | OEM Certificate or Test certificate of any Government/Govt approved/international accredited laboratory to be produced by supplier. |
| | g) Power Meter range : +10 to -60dB or better | |
| | h) Accuracy : ± 0.20 dB | |
| | i) Resolution : 0.01 dB | |

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| j) Tone Detection : 270Hz, 1Khz, 2Khz | Connect power source to power meter and select 2 Khz in power source, power meter will detect the same and display. |
| k) Operating Temperature range : -10°C to 50°C or better | OEM Certificate or Test certificate of any Government/ Govt approved/international accredited laboratory to be produced by supplier. |
| l) Should be able to Display power in dBm, mW & μW | Functional Test : In Power meter setup select different units of measurement to display the result. |
| m) Result management software should be supplied with the kit to download and manage the results on a PC/Laptop and Should be able to save 100 results or more. | Functional check by downloading results on PC or laptop. |

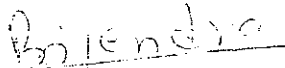
3. Optical Light Source

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| i) General: Handheld optical source single mode (1310nm and 1550nm) should have dual wavelength on single port with auto wavelength functionality. | Functional Test : connect power meter to power source with test patch cord and toggle between both wave length to display same on power meter. |
| ii) Optical source should be ruggedly built for demanding field use and to survives drops, vibrations and impacts | OEM Certificate or Test certificate of any Govt approved/international accredited laboratory to be produced by supplier. |
| iii) Laser source should incorporate interchangeable connector adapters for simple network connection. Preferably it should be SC | Physical Test by changing diferent type of connectors |
| iv) Tone Generation : 270Hz, 1Khz, 2Khz | Connect power source to power meter and select 2 Khz in power source, power meter will detect the same and display |
| v) Source type : Laser | OEM Certificate or Test certificate of any Govt approved/international accredited laboratory to be produced by supplier. |
| Optical source should have the following specifications: | |
| vi) Operating Temperature range : -10 to 50° C or better | |
| vii) Certifications: CE, Class 1 laser. | |
| viii) Laser power output : -7 dBm | |
| ix) Power Measurement Linearity:-0.1 dB | Functional test by connecting with Optical power meter through Test fiber patch cord |
| x) Should be able to Display power in dBm, mW & μW | |
| xi) Battery Operated: 2 AA alkaline batteries with minimum 50 hours life on both Power source & Power Meter. | Functional Test : Connect Both Power meter and power source with Test patch cord and keep unit on for 2 days. |

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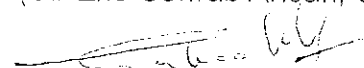
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| 4 Visual Fault Locator | |
| a) General : The Visual Fault Locator is a hand-held tool that helps to diagnose and repair simple fiber link problems. It emits a bright beam of red light easily visible from a distance. Thus it performs simple end-to-end continuity checks. The tool will have ability to quickly illuminate fiber breaks, defective splices in splice trays, and tight fiber bends in and around equipment racks. | Functional Test : Connect a Bad patch cord with Visual Fault Locator and check the light at the break and at the end. |
| b) Fiber Compatibility : Multimode and Single mode Fibers | Functional Test : Connect a Both MM & SM patch cord with Visual Fault Locator and check the light at the end. |
| c) Wave Length : 650 nm ±25nm (Visible wave length) | OEM Certificate or Test certificate of any Government/ Govt approved/international accredited laboratory to be produced by supplier. |
| d) Source type : Laser | |
| e) Laser Safety rating : Class II | |
| f) Output power : 1.0 m W max. | |
| g) Operation mode : Continuous (steady) and flashing | Functional Test : Connect a patch cord with Visual Fault Locator and check the light at the end and toggle between flashing switch |
| h) Range : At least 3 km for multimode. 4 km for single mode or better | Functional Test : Connect to fiber reel of Maximum length to verify the same |
| i) Adapter : 2.5mm universal (SC, ST, FC) connectors and 1.25mm universal (LC, MU) connectors. | Functional Test: Connect a SC & LC patch cord with Visual Fault Locator and check the light at the end and toggle between flashing switch. |
| j) Battery : 2xAA alkaline batteries | Physical verify the battery installed |
| k) Battery life : => 30 hours or better in continuous mode | Functional Test: Connect Visual fault locator with patch cord and keep unit on for 30 hours. |
| 5 Fiber Inspector | |
| a) Digital Fiber Inspector video probe camera shall provide high resolution magnification 200x & 400x or better end face images of both multi mode and single mode end-faces inside ports and on patch cords. | OEM Certificate or Test certificate of any Govt approved/international accredited laboratory to be produced by supplier. B.O.O either be accepted same or equipment may be tested from any Govt approved laboratory. |
| b) Display: 1.8 in (46cm) screen or better | Physical Test by measuring the screen size |
| c) Should support various probe adapter tips for inspection through many different connector port types | Functional Test : Connect Fiber Inspector probe to SC / LC/ ST patch cords verify |
| d) Should have automatic pass/fail function as per IEC 61300 standard | OEM Certificate or Test certificate of any Govt approved/ international accredited laboratory and and Functional test to show, the pass / fail to the end face of the fiber under taste. |
| e) Certification : CE | |
| f) Easily connectable with OTDR. | Physical Verification |
| g) Power source : Rechargeable NiMH or Li-ion battery or ac power with adopter or USB port | Physical verification of installed battery |

| | | |
|---|--|--|
| | h) The handheld test kit should house all the items mentioned in srl no (2,3, 4 & 5) and to be supplied in a professional and durable case. | Physical Verification |
| 6 | Fiber Cleaning Kit | |
| | a) The cleaning kit will have tools to effectively remove contaminants from fibre connectors, fibre ports. All cleaning materials must be lint-free and enable an optimal wet and dry cleaning process. The kit should have rugged carrying case for carrying and strong cleaning components. The kit should have detailed cleaning instruction. | Physical Test |
| | b) There should be additional storage space for patch cords, adapters etc. | Physical check |
| | The kit should consist of :- | |
| | i. Industrial standard fiber solvent to clean the fiber –for cleaning 100 connectors. | Physical Test |
| | ii. Lint free Fiber optic cleaning paper/cube /cards – for cleaning 100 connectors. | Physical Test |
| | iii. Lint free Fiber optic solvent swabs – 100 nos. | Physical Test |
| | iv. Should have cleaner for 1.25mm and 2.5mm connector- 100 nos | Functional check by live demonstration |
| | v. Should have automatic cleaning instrument for dirty port by one click-5 nos. | Physical Test |
| | c) Fiber cleaning kit should be in a separate professional and durable case and should have enough space to housed above mentioned items from srl no 6(a) to (c) | -do- |


(SI/RM Bijendra Singh, BSF)



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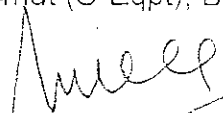

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