DEPARTMENT OF ELECTRICAL ENGINEERING

INDIAN INSTITUTE OF TECHNOLOGY DELHI

Ref. No. IITD/EE/OCL/NPN(05)/BEEN(JOP) Date: 20.09.11

NOTICE INVITING QUOTATIONS

Sub: Purchase of Optical components for Free Space Optical Communication Link

Sealed quotations are invited for **: Purchase of Optical components for Free Space Optical Communication Link** from the authorized dealers/ suppliers/ manufacturers in the sealed envelopes subscribing our reference No. and due date in the name of undersigned.

Technical Details

NIQ for : Optical components for Free Space Optical Communication Link
Refer: Enclosure as per Appendix I for detailed specs of the products.

Terms and conditions:

1. Please submit TECHNICAL and FINANCIAL bids in separate sealed envelopes. Mark the two envelops clearly as "Technical Bid" and "Financial Bid". Both the sealed envelops should be sent in a single sealed envelope clearly marked as "Quotation for "**:Optical components for Free Space Optical Communication Link.** The project is a turnkey project and Lowest bidder will be decided on the basis of total cost of equipment plus installation charges.

2. The Quote should reach the following address on or before 10-10-11 Up to 4 PM

   Prof. Ms. Devi Chadha
   Optical Communication Lab
   Block II Room No. 203
   Department of Electrical Engineering
   IIT Delhi Hauz Khas
   New Delhi 110016

3. Quote should be valid for atleast three months.

4. Price quoted should be FOB inclusive of all taxes and duties.

5. VAT and TIN No. of the supplier should be clearly mentioned.

6. If the quote is being submitted by the representative of the principals or manufactures themselves, please attach a valid agency certificate/dealership certificate authorizing the agent to quote on behalf of the manufacturer or principles.

7. Produce compliance certificate for technical specifications.

Kindly put the NIQ with specification attached on IIT D Website.

Devi Chadha

8. The companies who comply with technical specifications in technical bid will be invited for Demonstration of technical features to the committee at its own expenses before issuing of supply order at date and time to be specified.

9. The Financial bid of only those companies who comply with the Technical Specification in Technical bid and satisfactory demonstration of technical features to the committee will be considered.

10. Commercial bid must include clearly applicable taxes, Delivery Schedule, Quotation validity, warranty and payment terms.

11. Bidder/supplier would be fully responsible for installation of the above equipment. Appropriate wires, industrial plugs, tops etc. needed for installation would be provided by the supplier

12. The bidder must be a manufacturer or authorized service provider capable of providing technical Service and repair of the product.

13. The product must be ISO certified.

14. The Institute reserves the right to accept or reject any quotation or all quotations without assigning any reasons thereof.

Devi Chadha

Prof. Devi Chadha
Prof EED

<table>
<tr><th>S.No</th><th>Nomenclature</th><th>Qty</th><th>Specifications</th></tr>
<tr><td>1</td><td>SM Fiber coupled Laser Source</td><td>01</td><td>• Wavelength: 1550 nm
• Power: 1.5 mW
• Configuration: D Pin Code
• Fiber: SM Fiber Pigtailed Laser Diode
• Fiber connectors: FC/PC</td></tr>
<tr><td>2</td><td>Mount</td><td>01</td><td>LD/TEC Mount for Fiber-Pigtailed Laser Diodes
<table><tr><td>Laser Current (Max)</td><td>2 A</td></tr><tr><td>Laser Diode Polarity</td><td>Selectable</td></tr><tr><td>Monitor Diode Polarity</td><td>Selectable</td></tr><tr><td>RF Power (Max)</td><td>200 mW, RMS</td></tr><tr><td>RF Input Impedence</td><td>50 Ω</td></tr><tr><td>Modulation Frequency (Bias-T)</td><td>200 kHz to >1 GHz</td></tr><tr><td>TEC Current (Max)</td><td>5 A</td></tr><tr><td>TEC Voltage (Max)</td><td>4 V</td></tr><tr><td>TEC Heating/ Cooling Capacity</td><td>20 W</td></tr><tr><td>TEC Interface</td><td>DB9, Male</td></tr><tr><td>Temperature Sensor</td><td>AD592, 10 k Thermistor</td></tr><tr><td>Temperature Range (@25 °C w/ 2 A TEC Current)</td><td>10 to 70 °C</td></tr><tr><td>Remote Interlock</td><td>2.5 mm Phono Jack</td></tr></table></td></tr>
<tr><td>3</td><td>Benchtop Laser Diode/TEC Controller</td><td>01</td><td>Benchtop Laser Diode/TEC Controller, 1 A / 96 W
<table><tr><td>Current Control Range</td><td>0 to 1 A</td></tr><tr><td>Compliance Voltage</td><td>>10 V</td></tr><tr><td>Photocurrent Measurement Ranges</td><td>2 mA / 20 mA</td></tr><tr><td>QCW* Mode Pulse Width Range</td><td>100 µs to 1 s</td></tr><tr><td>QCW* Repetition Rate Range</td><td>1 ms to 5 s (0.2 to 1000 Hz)</td></tr><tr><td>TEC Current Range</td><td>-8 to 8 A</td></tr><tr><td>TEC Compliance Voltage</td><td>>12V</td></tr><tr><td>TEC Output Power Max</td><td>>96 W</td></tr><tr><td>Temperature Range Max</td><td>-55 to 150 °C **</td></tr><tr><td>Supported Temperature Sensors</td><td>Thermistors, Pt100, Pt1000, AD590, AD592, LM335, LM235, LM135, LM35</td></tr></table></td></tr>
<tr><td>4</td><td>Modulation Bias T</td><td>02</td><td>Laser Diode Bias-T PCB
Modulation frequencies: 10 KHz – 1 GHz</td></tr>
<tr><td>5</td><td>Collimator with FC connector</td><td>01</td><td>Wavelength: 1550 nm
Focal length of lens (f): 4.67 mm
NA = 0.53
Package: FC/PC Fiber Collimation Pkg.</td></tr>
<tr><td>6</td><td>Collimator with FC connector</td><td>01</td><td>Wavelength: 1550 nm
Focal length of lens (f): 8.18 mm
NA = 0.49</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td colspan="2">Package: FC/PC Fiber Collimation Pkg.</td></tr>
<tr><td>7</td><td>Collimator adaptor</td><td>02</td><td colspan="2">SM1 Adapter for Ø11 mm Collimators – Appropriate for the above Collimators</td></tr>
<tr><td>8</td><td>Detector</td><td>01</td><td colspan="2">
<table>
<tr><td>Optical Input</td><td>Free-Space</td></tr>
<tr><td>Supply Voltage</td><td>+8 to +20 V</td></tr>
<tr><td>Current Consumption</td><td>250 mA</td></tr>
<tr><td>Max. Incident Power</td><td>2 mW</td></tr>
<tr><td>Operating Temperature</td><td>10 to 40 °C</td></tr>
<tr><td>Wavelength Range[b]</td><td>850 - 1650 nm</td></tr>
<tr><td>Detector Diameter</td><td>0.04 mm</td></tr>
<tr><td>Frequency Range</td><td>1 to 1800 MHz</td></tr>
<tr><td>3 dB Bandwidth</td><td>10 to 1000 MHz</td></tr>
<tr><td>Rise Time</td><td>0.5 ns</td></tr>
<tr><td>Gain Setting 1[c]</td><td>5 x 10^4 V/W</td></tr>
<tr><td>Gain Setting 2[c]</td><td>5 x 10^2 V/W</td></tr>
<tr><td>Dark State Noise Level[d]</td><td>-90 dBm</td></tr>
<tr><td>NEP (Calculated)</td><td>16.6 pW/($Hz^{1/2}$)</td></tr>
<tr><td>Output Connector</td><td>SMA</td></tr>
<tr><td>Output Impedance</td><td>50 Ω</td></tr>
<tr><td>Device Dimensions</td><td>60 mm x 50 mm x 27 mm</td></tr>
<tr><td>Output Coupling</td><td>AC</td></tr>
<tr><td colspan="2">General</td></tr>
<tr><td>On : Off Switch:</td><td>Slide</td></tr>
<tr><td>Battery Check Switch:</td><td>Momentary Pushbutton</td></tr>
<tr><td>Output:</td><td>BNC (DC Coupled)</td></tr>
<tr><td>Package Size:</td><td>2.8" x 1.9" x 0.83"
70mm x 48mm x 21mm</td></tr>
<tr><td>PD Surface Depth:</td><td>0.07" (1.9mm)</td></tr>
<tr><td>Weight:</td><td>0.2 lbs</td></tr>
<tr><td>Accessories:</td><td>SM1T1 Coupler
SM1RR Retainer Ring</td></tr>
<tr><td>Storage Temp:</td><td>-25 to 70°C</td></tr>
<tr><td>Operating Temp:</td><td>10 to 50°C</td></tr>
<tr><td>Battery:</td><td>A23 12V$_{DC}$ 40mAh</td></tr>
<tr><td>Low Battery Voltage[3]
V_{OUT} (Hi-Z)
V_{OUT} (50Ω):</td><td>(See "Battery Check")
~9V
~400mV</td></tr>
</table>
</td></tr>
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<table>
<tr><td>9</td><td>PTZ stage</td><td>01</td><td>
<table>
<tr><td colspan="2">PT Series</td></tr>
<tr><td>Travel</td><td>1.0" (25 mm)</td></tr>
<tr><td>Configuration</td><td>Left- or Right-Handed</td></tr>
<tr><td>Orthogonality</td><td><5 mrad</td></tr>
<tr><td>Angular Deviation</td><td><250 µRad</td></tr>
<tr><td colspan="2">PT1 (PT1/M) Micrometer</td></tr>
<tr><td>Resolution</td><td>0.025" (500 µm) Translation per Revolution</td></tr>
<tr><td>Coarse Range</td><td>1" (25 mm)</td></tr>
<tr><td>Fine Resolution</td><td>0.001" (25 µm) Translation per Revolution</td></tr>
<tr><td>Fine Range</td><td>0.01" (250 µm)</td></tr>
<tr><td colspan="2">Max Load</td></tr>
<tr><td>Vertical</td><td>20 lbs (~9 kg)</td></tr>
<tr><td>Horizontal</td><td>90 lbs (~41 kg)</td></tr>
<tr><td>Bearing Type</td><td>Ball on Hardened V-Grooves</td></tr>
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</td></tr>
<tr><td>10</td><td>Laser Source focusable</td><td>01</td><td>
<table>
<tr><td>Wavelength</td><td>635 nm</td></tr>
<tr><td>Power</td><td>4.5 mW</td></tr>
<tr><td>Safety Class</td><td>3R</td></tr>
<tr><td>Beam Shape</td><td>Elliptical, Focusable</td></tr>
<tr><td>Beam Profile</td><td>CPS196 - Collimated Beam Profile</td></tr>
<tr><td>Housing</td><td>Ø11 mm x 46 mm</td></tr>
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</td></tr>
<tr><td>11</td><td>Power Supply</td><td>01</td><td>5 VDC Regulated Power Supply for the above laser</td></tr>
<tr><td>12</td><td>VIS/IR Viewing Card</td><td>01</td><td>Absorption band: 400 - 640 nm, 800 - 1700 nm
Emission band: ~580 - 750 nm
Active region: 31.8 mm x 54 mm</td></tr>
<tr><td>13</td><td>BNC Cable</td><td>01</td><td>both end male 24 inch length, operating frequency range upto 2.5Ghz min</td></tr>
<tr><td>14</td><td>BNC Cable</td><td>01</td><td>Male to Female, 24 inch length, operating frequency range upto 2.5Ghz min</td></tr>
<tr><td>15</td><td>BNC termination</td><td>02</td><td>BNC termination with Dual BNC female connector terminated into twin pin connector</td></tr>
<tr><td>16</td><td>Variable Optical Attenuator</td><td>01</td><td>
<table>
<tr><td>Operating Wavelength: 1200 to 1600 nm</td></tr>
<tr><td>Fiber: SMF-28e or Equivalent</td></tr>
<tr><td>Attenuation Range: 1.5 - 50 dB</td></tr>
<tr><td>Attenuation Resolution: ≤0.1 dB</td></tr>
<tr><td>Back Reflection (Return Loss): >55 dB</td></tr>
<tr><td>Polarization Sensitivity: ≤0.2 dB</td></tr>
<tr><td>Optical Power: ≤300 mW</td></tr>
<tr><td>Thermal Stability: ≤0.03 dB/°C</td></tr>
<tr><td>Operating Temperature: 0 to 60 °C</td></tr>
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