

DEPARTMENT OF ELECTRICAL ENGINEERING

INDIAN INSTITUTE OF TECHNOLOGY DELHI

Ref. No. IITD/EE/OCL/NPN(05)/BEEN

Date: 12.02.2013

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 envelopes clearly as "Technical Bid" and "Financial Bid". Both the sealed envelopes 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 26.2.2013 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.

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.

Prof. Devi Chadha
Prof. EE Deptt

Prof. V. Chandra
Prof. EE Deptt

Prof. V.K Jain
Prof. EE Deptt

Prof. Swades De
Assoc. Prof EED

Annexure I
TECHNICAL SPECIFICATIONS

**Optical components for Free Space Optical
Communication Link**
**(COMPATIBLE WITH THORLAB FIBER OPTIC COMPONENTS FOR FSO
COMMUNICATION LINK PROCURED EARLIER)**

S.No	Nomenclature	QTY	Specifications																										
1	2x2 SM Coupler	04	Center Wavelength :1310/1550 nm Wavelength Range : ±40 nm Coupling Ratio : 50:50 Insertion Loss (dB) : 3.8 / 3.8 Excess Loss : 0.2 dB PDL : <0.15 dB Directivity : >60 dB Termination : FC/PC																										
2	Mount	01	LD/TEC Mount for Fiber-Pigtailed Laser Diodes <table border="1" style="width: 100%; border-collapse: collapse;"> <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>	Laser Current (Max)	2 A	Laser Diode Polarity	Selectable	Monitor Diode Polarity	Selectable	RF Power (Max)	200 mW, RMS	RF Input Impedence	50 Ω	Modulation Frequency (Bias-T)	200 kHz to >1 GHz	TEC Current (Max)	5 A	TEC Voltage (Max)	4 V	TEC Heating/ Cooling Capacity	20 W	TEC Interface	DB9, Male	Temperature Sensor	AD592, 10 k Thermistor	Temperature Range (@25 °C w/ 2 A TEC Current)	10 to 70 °C	Remote Interlock	2.5 mm Phono Jack
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3	SM Fiber coupled Laser Source	01	<ul style="list-style-type: none"> • Wavelength: 1550 nm • Power: 1.5 mW • Configuration: D Pin Code • Fiber SMF-28-J9 • Threshold Current : 10 Ma • Operating Current : 30 mA • Operating Voltage : 1.1 V • Slope Efficiency : 0.25 mW/mA • Monitor Current : 0.5 mA • Fiber: SM Fiber Pigtailed Laser Diode <p style="margin-left: 40px;">Fiber connectors: FC/PC</p>																										
4	Mating Sleeve	04	Wide Key :2.2 mm FC/PC to FC/PC Mating Sleeve Insertion Loss :<0.5 dB D-Hole+																										
5(a)	Detector	04	<table border="1" style="width: 100%; border-collapse: collapse;"> <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> </table>	Optical Input	Free-Space	Supply Voltage	+8 to +20 V	Current Consumption	250 mA	Max. Incident Power	2 mW																		
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			Operating Temperature	10 to 40 °C
			Wavelength Range ^b	850 - 1650 nm
			Detector Diameter	0.04 mm
			Frequency Range	1 to 1800 MHz
			3 dB Bandwidth	10 to 1000 MHz
			Rise Time	0.5 ns
			Gain Setting 1 ^c	5 x 10 ⁴ V/W
			Gain Setting 2 ^c	5 x 10 ² V/W
			Dark State Noise Level ^d	-90 dBm
			NEP (Calculated)	16.6 pW/(Hz ^{1/2})
			Output Connector	SMA
			Output Impedance	50 Ω
			Device Dimensions	60 mm x 50 mm x 27 mm
			Output Coupling	AC
			Sensitivity	0.9A/W
5(b)	Power Supply	04	9 VDC Regulated Power Supply for the detector 2.5 mm Phono Plug Output current:220mA Input Voltage:200-264VAC Input power 11VA Max Ripple:10mV RMS Combined Regulation:±5% Fuse :Thermal Fuse and 250 mA Slow Blow Type Indicator : LED with On/Off Switch Operating Temperature : 0 to 40°C Dimensions (L x W x H) : 4.75" x 3.0" x 1.89" Output Connector : Male: 2.5 mm, Tip (+) Input Configuration : IEC 320	
6	PTZ stage	01	Travel	1.0" (25 mm)
			Configuration	Left- or Right-Handed
			Orthogonality	<5 mrad
			Angular Deviation	<250 μRad
			PT3 (PT3/M) Micrometer	
			Resolution	0.025" (500 μm) Translation per Revolution
			Coarse Range	1" (25 mm)
			Fine Resolution	0.001" (25 μm) Translation per Revolution
			Fine Range	0.01" (250 μm)
			Max Load	
			Vertical	20 lbs (~9 kg)
			Horizontal	90 lbs (~41 kg)
			Bearing Type	Ball on Hardened V-Grooves
7	Mirror	02	Substrate : Float Glass Thickness : 3.2 ± 0.25 mm Reflectivity : R _{avg} >96% from 800 nm - 20 μm Damage Threshold : 2 J/cm ² 1064 nm, 10 ns, 10 Hz, Ø1.000 mm Front Surface Flatness : <5λ/in ² @ 633 nm Diameter : 1"(25 mm) Diameter Tolerance : +0.0/-0.25 mm Clear Aperture : >90% of Surface Surface Quality : 60-40 Scratch-Dig	

8	Kinematic Mount	02	<ul style="list-style-type: none"> • Mounts Ø1" Optics at Least 0.12" (3 mm) Thick • Optic Held with a Nylon-Tipped Setscrew • Angular Range: ±4° • Resolution: 8 mrad (0.5°) per rev via Two 1/4"-80 TPI Precision Adjusters • Two Counterbored #8 (M4) Through Holes Allow for Left- or Right-Handed Orientation • Removable Knobs Expose Hex Sockets in Lead Screws 																																																																														
9	Compact Power Meter Console-Along with Photodiode sensor	01	<table border="1"> <tr><td colspan="3">Compact, Handheld, Analog Needle, Power Meter Console</td></tr> <tr><td colspan="3">Digital Display Screen</td></tr> <tr><td colspan="3">Long-Life Internal Li-Polymer Battery</td></tr> <tr><td colspan="3">Hard Case to Store the Console and one Sensor</td></tr> <tr><td>Compatible Sensors</td><td colspan="2">Photodiode and Thermal</td></tr> <tr><td>Optical Power Range[†]</td><td colspan="2">100 pW to 200 W</td></tr> <tr><td>Available Sensor Wavelength Range[†]</td><td colspan="2">185 nm - 25 µm</td></tr> <tr><td>Display Refresh Rate</td><td colspan="2">20 Hz</td></tr> <tr><td>Bandwidth[†]</td><td colspan="2">DC - 100 kHz</td></tr> <tr><td>Photodiode Sensor Range[‡]</td><td colspan="2">50 nA - 5 Ma</td></tr> <tr><td>Thermopile Sensor Range[‡]</td><td colspan="2">1 mV - 1 V</td></tr> </table> <table border="1"> <tr><td colspan="2">Detector Type</td><td>Germanium Photodiode</td></tr> <tr><td colspan="2"></td><td>5mWposition 500mWposition</td></tr> <tr><td>Wavelength Range</td><td>700 nm - 1800nm</td><td>700 nm - 1800 nm</td></tr> <tr><td>Optical Power Range</td><td>5 nW - 5 mW</td><td>100 µW - 500 mW</td></tr> <tr><td>Max Average Power Density</td><td>100mW/cm²</td><td>10W/cm²</td></tr> <tr><td>Max Pulse Energy Density</td><td>20nJ</td><td>20µJ</td></tr> <tr><td>Linearity</td><td colspan="2">± 1%</td></tr> <tr><td>Resolution</td><td>1 nW</td><td>100 nW</td></tr> <tr><td>Response Time</td><td colspan="2">< 1 µs</td></tr> <tr><td>Sensor Dimensions</td><td colspan="2">150mm x 15 mm x 10 mm 5mm Thickness on Sensor Side</td></tr> <tr><td>Active Detector Area</td><td colspan="2">9.7 mm x 9.7 mm</td></tr> <tr><td>Input Aperture</td><td colspan="2">Ø9.5 mm</td></tr> <tr><td>Cable Length</td><td colspan="2">1.5 m</td></tr> <tr><td>Connector</td><td colspan="2">Sub-D 9p male</td></tr> <tr><td>Weight</td><td colspan="2">0.125 kg</td></tr> </table>	Compact, Handheld, Analog Needle, Power Meter Console			Digital Display Screen			Long-Life Internal Li-Polymer Battery			Hard Case to Store the Console and one Sensor			Compatible Sensors	Photodiode and Thermal		Optical Power Range [†]	100 pW to 200 W		Available Sensor Wavelength Range [†]	185 nm - 25 µm		Display Refresh Rate	20 Hz		Bandwidth [†]	DC - 100 kHz		Photodiode Sensor Range [‡]	50 nA - 5 Ma		Thermopile Sensor Range [‡]	1 mV - 1 V		Detector Type		Germanium Photodiode			5mWposition 500mWposition	Wavelength Range	700 nm - 1800nm	700 nm - 1800 nm	Optical Power Range	5 nW - 5 mW	100 µW - 500 mW	Max Average Power Density	100mW/cm ²	10W/cm ²	Max Pulse Energy Density	20nJ	20µJ	Linearity	± 1%		Resolution	1 nW	100 nW	Response Time	< 1 µs		Sensor Dimensions	150mm x 15 mm x 10 mm 5mm Thickness on Sensor Side		Active Detector Area	9.7 mm x 9.7 mm		Input Aperture	Ø9.5 mm		Cable Length	1.5 m		Connector	Sub-D 9p male		Weight	0.125 kg	
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