Requirements / Specification Document

NIST National Institute of Standards and Technology U.S. Department of Commerce

TITLE: Frequency Comb System

Requesting Laboratory / Division / Group:

Communications Technology Laboratory
RF Technology Division
Electromagnetic Fields Group (672.02)

General Statement of Need:

The Electromagnetic Fields Group is in need of a frequency comb system for locking four lasers with wavelengths of 776 nm, 780 nm, 960 nm, and 1260nm. The system should provide the beat detection between fiber inputs for the lasers and the comb lines, all locking electronics, and a frequency counter.

Item Specifications and Quantities:

Item 1:	Optical Frequency Comb	
Quantity:	1 Each	
Specifications:	1.1	1560 nm ± 20 nm Center wavelength
	1.2	± 2 MHz comb mode spacing tuning
	1.3	>50 nm Spectral Width at -10 dB
	1.4	6 output ports, > 10 mW output per port
	1.5	SC/APC-PM output connector
	1.6	10 MHz RF Reference with 1E-10 in 1s stability
	1.7	Internal beat detection unit
Item 2:	Frequency Extension Base Module	
Quantity:	1 Each	
Specifications:	2.1	Wavelength range: at least 700 – 1500 nm
	2.2	Amplification for multiple channels
	2.3	> 4 channel compatibility
	2.4	FC/APC connectors for input lasers (one for each channel)
Item 3:	Frequency Extension Channel	
Quantity:	4 Each	
Specifications:	3.1	One to cover each wavelength: 776 nm, 780 nm, 960 nm, 1260 nm
	3.2	Spectral filter
	3.3	Beat detection for each channel
Item 4:	Laser Locking Module	
Quantity:	4 Each	
Specifications:	4.1	Electronics to create error signal from beat detection
	4.2	SMA output (one for each channel)
Item 5:	Enclosure and control	
Quantity:	1 Each	
Specifications:	5.1	Size – 3U 19" Rack
	5.2	Ethernet, RS-232, and USB ports
	5.3	Front panel
	5.4	Full remote control of comb system
	5.5	Compatibility with python, MATLAB, etc.
	5.6	Contains comb, frequency extenders, locking electronics
Item 6:	Frequency Counter	
Quantity:	1 Each	
Specifications:	1.1	Counter for at least 4 channels
	1.2	No dead time

[List any additional item(s) or service requirements using the same format.]

Vendor Requirements

1. Possess at time of award/contracting an Export Control Classification Number (ECCN).

2. Possess at time of award/contracting a Unique Entity Identification Number (UEI) which registration is listed as "Active" on the GSA System for Award Management (SAM.gov).

Procurement Support Information and Ancillary Services:

[Provide input for each section Below or Mark Not Applicable (N/A)]

Section		Requirements/Specifications
Planning Considerations ☒ N/A	☐	List any visits required to allow potential vendors to see site specific constraints. [Explain Requirements.]
	☐	US citizen required on-site (foreign nationals require pre-registration 30 days prior to visit.)
	☐	Vendor Representative On-Site more than three (3) days.
	☐	Other Considerations: [List other considerations to ensure an accurate quote.]

Shipping & Delivery
☐ N/A

Shipping Address:

☒ NIST-Boulder
Mail Stop: 672.02
325 Broadway
Boulder, CO 80305

☐ NIST-Gaithersburg
ATTN:
Mail Stop:
100 Bureau Dr
Gaithersburg MD 20899

☐ [Alternate Shipping Address]

Shipping Criteria:

☐ Partial Delivery Acceptable

☐ [Enter Shipping and Delivery information by item.]

☐ Direct Delivery to OU Building Required

[Explain Need for Requirement]
Building /Room Number: [Enter Building/Room Number]
☐ Building has Loading Dock
Containerization Preference: [Enter Container Type]
Other Requirements:
[List Any Other Requirement]

Delivery Date Criteria:

☒ Delivery Shall Be Competed No Later Than:
Click or tap to enter a date.

☐ Delivery Shall Be Made No Earlier Than:
Click or tap to enter a date.

☐ Scheduled Deliveries:

Item Number	Due Date

☐ Other:
[List Other Shipping, Delivery or Special Requirements.]

Electronic Media
☐ N/A

[Enter Electronic Media Requirements by Item.]

☐ Software

☒ Electronic Manuals

☐ License Key

☐ Other:
[List Any Other Electronic Media Requirements]

☒ US Government Email Address for Software Delivery:
TBD

Installation
☐ N/A

[Enter Installation Requirements by Item]

☒ Vendor Technician on Site

☐ Rigging

☐ Uncrating / Unpackaging

☐ Removal of Packaging Material

☒ Equipment Set Up

☐ Start-Up Services

☐ Turnkey Installation

☐ Other:
[Enter Details]

NOTE: TPOC shall be the coordination POC.

Facility / Utility Considerations
☒ N/A

[List Site Specific Utility Considerations by Item]

☐ OFPM Work Order Numbers
[List Work Order Numbers]

☐ Power Available

Voltage: [Enter voltage] (V)
Maximum Current: [Enter max current draw] (A)
Phase: [Choose Phase]
Frequency: [Typically 60Hz] (Hz)
NEMA Plug Type: [Enter Plug Type] (i.e.: NEMA L5-20P)
Environment: [Choose Environment]
Other Power Considerations:
[List Any Other Power Considerations.]

☐ Utility Connections:
[List Relevant Available Utilities, Pressure(s) and Flowrate(s).]

☐ Other Considerations:
[List Other Considerations to Ensure an Accurate Quote.]

Inspection and Acceptance

[Inspection Requirements Per Item (Who, When, What, Where)]

☐ On-Site

☐ N/A

☒ Acceptance Not Expected to Exceed 7 Business Days
☐ Acceptance Expected to Exceed 7 Business Days:
[Duration]
☐ Inspection and Acceptance Plan:
[Explanation]
☐ Other:
[Enter Other Requirements]

Training
☐ N/A

Training Requirements (Who, When, What, Where)

☐ Number of Trainees: 2
☒ On-Site
☐ Off-Site Location: [Enter Location(s)]
Is Trainee Travel Required: [Choose Answer]

Scope of Training
☐ Operation ☒ Maintenance ☒ Troubleshooting
☐ Safety ☐ Other
[Enter Other Scope of Training Requirements]
☐ Training Materials to be Provided by Government:
[Describe Materials]
☐ Training Materials to be Provided by Vendor:
[Describe Materials]
☐ Other
[Enter Other Training Requirements]

NOTE: SME shall be coordination POC.

Warranty
☐ N/A

Extended Warranty Required
Warranty Length: 12 months
What is included?
☐ Labor ☒ Parts ☐ Travel
☐ Cost and Liability for Returns
☐ Other
[Enter Other Requirements]
☐ 1 Option Period
☐ 2 Option Periods
☐ 3 Option Periods
☐ 4 Option Periods (Maximum)

Calibration
☒ N/A

[Describe Calibration Requirements Per Item]
Calibration Plan Length: [i.e. 3 - Years]
What is Included?
☐ Labor ☐ Spare Parts ☐ Consumables
☐ Travel ☐ Cost and Liability for Shipment
☐ Software Updates ☐ Manuals
☐ Other
[Enter Other Requirements]
☐ Requirements:
[Enter Requirements] (i.e.: On-Site Within 72 hours, etc.)
☐ 1 Option Period
Length: [i.e. 1 – Year / 6 - Months]
☐ 2 Option Periods
☐ 3 Option Periods
☐ 4 Option Periods (Maximum)

Maintenance
☒ N/A

[Describe Maintenance Requirements Per Item]
Maintenance Plan Length: [i.e. 3 - Years]
What is Included?
☐ Labor ☐ Spare Parts ☐ Consumables
☐ Travel ☐ Cost and Liability for Shipment
☐ Software Updates ☐ Manuals
☐ Other
[Enter Other Requirements]
☐ Requirements:
[Enter Requirements] (i.e.: On-Site Within 72 hours, etc.)
☐ 1 Option Period
Length: [i.e. 1 – Year / 6 - Months]
☐ 2 Option Periods

	☐ 3 Option Periods ☐ 4 Option Periods (Maximum)
Government Furnished Material / Equipment ☒ N/A	List Any Government Furnished Material / Equipment Per Item] ☐ Samples for Testing ☐ Equipment which will leave Government Site Description: [Enter Description] Serial Number: [Enter Serial Number] NIST Property Number: [Enter NIST Property Number] ☐ Other: [Enter Other Details]
Travel ☒ N/A	[Describe any Travel Requirements Per Item] ☐ Explain: [Enter Justification / Requirement] ☐ Other: [Enter Other Requirements] NOTE TO VENDOR: To the maximum extent possible, include travel requirement estimates as part of pertinent sections above (Installation, Maintenance, Repair, etc.). Otherwise, Travel will be a separate line item, reimbursable per the Federal Travel Regulation.