Requirements / Specification Document

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

TITLE: Frequency Comb Lasers

Requesting Laboratory / Division / Group:

Communications Technology Laboratory
Radio Frequency Technology Division
Guided Wave Electromagnetics (Group (672.01)

General Statement of Need:

The National Institute of Standards and Technology (NIST)/Communications Technology Laboratory (CTL) needs to synchronize ultrafast fiber lasers to external RF and optical references for RF generation and detection up to >300 GHz. These lasers must have fast repetition rate control, carrier envelope offset frequency control, and high power output at 1560 nm and 780 nm wavelengths.

Item Specifications and Quantities:

Item 1:	780 nm Ultrafast Fiber Laser	
Quantity:	1 EACH	
Specifications:	1.1	100.000000 MHz repetition rate within tuning range
	1.2	1560 nm oscillator center wavelength
	1.3	1 MHz repetition rate tuning range using fast piezo cavity length tuning with low-noise slow locking mechanism (temperature or motor) for long term (>72 hour) phase locking
	1.4	Free space output selectable between 780 nm <100 fs pulses with >250 mW average power OR 1560 nm <100 fs pulses with >500 mW average power
	1.5	Continuously variable output power split ratio between 780 nm and 1560 nm outputs described in 1.4
	1.6	>=3 auxiliary PM fiber outputs at 1560 nm with >1 mW average power
	1.7	Electro-optic actuator inside oscillator for locking with ultrastable optical reference lasers
	1.8	Active temperature stabilization of laser oscillator
	1.9	100/115/230 VAC operation with <500 W AC power consumption

	1.10	New equipment with performance checked by the manufacturer before shipment
Item 2:	1560 nm Ultrafast Fiber Laser	
Quantity:	1 EACH	
Specifications:	2.1	100.000000 MHz repetition rate within tuning range
	2.2	1560 nm oscillator center wavelength
	2.3	1 MHz repetition rate tuning range using fast piezo cavity length tuning with low-noise slow locking mechanism (temperature or motor) for long term (>72 hour) phase locking
	2.4	Free space output of 1560 nm <100 fs pulses with >500 mW average power
	2.5	>=3 auxiliary PM fiber outputs at 1560 nm with >1 mW average power
	2.6	Electro-optic actuator inside oscillator for locking with ultrastable optical reference lasers
	2.7	Active temperature stabilization of laser oscillator
	2.8	100/115/230 VAC operation with <500 W AC power consumption
	2.9	New equipment with performance checked by the manufacturer before shipment

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
ATTN: Nate Orloff
Mail Stop: 672.01
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:
1/1/2027

☐ 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:

[Enter Address]

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

☐ N/A

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

☐ On-Site

☒ 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: [Enter Number of Trainees]

☐ 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	Base Manufacturer Warranty is acceptable
☐ N/A	Warranty Length: [i.e. 3 - Years] 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	[Describe Calibration Requirements Per Item]
☒ N/A	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.