PURCHASE CONTRACT

closed according to Act No. 89/2012 Coll., Civil Code

Supplier number: CRP_001 **Customer number:** 2025-0027

Contracting parties:

SUPPLIER		
Name:		**IMRA America Inc.**
ID number:		38-2931648
VAT number:		38-2931648 (US tax ID#)
Residence:	Street	1044 Woodridge Av.
City, state		Ann Arbor
zip code		MI 48105, USA
Acting on behalf of the supplier:		Dr. Martin E. Fermann

CUSTOMER		
Name:		**CESNET, association of legal entities**
ID number:		63839172
VAT number:		CZ63839172
Residence:	Street	Generála Píky 430/26
City, state		160 00 Prague 6 Czech Republic
zip code		
Acting on behalf of CESNET		Ing. Jakub Papírník director

IMRA America Inc. is a limited liability company, registered in Lansing, MI, USA	CESNET, association of legal entities, is registered in the register of associations, kept at the Municipal Court in Prague, file number L 58848

based on the result of the tender procedure for the public contract " System for conversion of optical frequencies of telecommunication band to radio frequency domain (Frequency Comb System)" (hereinafter referred to as the "public contract") conclude this purchase contract:

I. OBJECT OF THE CONTRACT

1. Based on this contract, the Supplier undertakes to supply the Customer with the following equipment, incl. related services:
   a) The system of the optical frequency comb and related devices and services (hereinafter also referred to as the "System") specified in Annex No. 1) of this contract
   b) Technical and user documentation for the System
   c) Transport to the place of fulfillment
   d) Remote Commissioning and operator training at the place of fulfillment

2. The customer undertakes to take over the performance according to the previous paragraph and to pay the purchase price properly and on time.

II. PRICE

1. The purchase price (hereinafter referred to as the "Price") is set as contractual and amounts to $175,000 USD without VAT (in words: one hundred and seventy five thousand USD). The item breakdown of the price is given in Annex No. 1) of this contract. VAT will be added to this price in the amount determined by the relevant legislation in force on the date of the taxable performance.

2. The price is set as the maximum allowable and includes all costs of the Supplier related to performance under this contract, including all related fees.

III. PAYMENT TERMS

1. The price shall be paid by the Customer on the basis of advance invoices and billing invoice (tax document). Payments will be made by the Customer based on invoices, according to the following schedule:
   i. The first invoice will be issued by the Supplier as an advance invoice in the amount of 30% of the price, after the conclusion of this contract (signing of the contract by both parties). The advance invoice will be due within 30 calendar days after the invoice is handed over to the Customer.
   ii. The second invoice will be issued by the Supplier after delivery of the goods to the place of fulfillment as a partial invoice with a payment of 20% of the price. The invoice will be due within 30 calendar days after the delivery of the invoice to the Customer.
   iii. The supplier will issue a final invoice, with an additional payment of 50% of the price after completion of the performance, i.e. after remote commissioning of the System at the place of fulfillment, remote operator training and signing of the handover protocol by the Customer. The final invoice is due within 30 calendar days from the date of delivery of the invoice to the Customer.

2. The term of payment of the invoice means the date of debiting the funds from the Customer's account, which will be sent to the Supplier's account indicated in the invoices.

3. Invoices issued by the Supplier will be sent to the address of the Customer's headquarters specified in this contract or to the e-mail address podatelna@cesnet.cz. The Customer is

obliged to make the payment of the invoice within 30 days from the delivery of this invoice to the Customer.

4. The invoices must contain reference to this contract and project (name: Quantum engineering and nanotechnology (QUEENTEC); identification number: CZ.02.01.01/00/22_008/0004649). The invoice must meet the requisites of a tax document in accordance with the provisions of § 28 paragraph 2 Coll. No. 235/2004 Coll., on value added tax, as amended. In the event that the invoice does not contain any of the requirements established in accordance with the wording of the previous sentence, the Customer has the right to return it to the Supplier without undue delay. The new due date begins to run from the day the invoice is re-delivered to the Customer.

IV. RESERVATION OF OWNERSHIP

Ownership is transferred to the Customer at the moment of full payment of the Price .

V. DELIVERY DATE AND PLACE OF FULFILLMENT

1. The supplier undertakes to supply and operate the System and to carry out the training of the System operator no later than 20 weeks from the effective date of this contract.

2. The place of fulfillment is the registered seat of the Customer, specified on the front page of this contract.

3. Contact person for the Customer: Ing. Ondřej Havliš, phone number +420 [redacted], e-mail: [redacted]

4. Contact person for the Supplier: Dr. Martin E. Fermann , tel. +1 [redacted] e-mail: [redacted].

VI. TERMS OF DELIVERY

1. The Supplier shall fulfill its obligation to deliver the System by properly handing it over to the Customer in accordance with the provisions of the contract. This obligation of the Supplier is considered properly and timely fulfilled if the performance was delivered to the place of performance within the term specified by the contract without defects and has the characteristics specified by this contract, legal regulations, technical and other standards that may be relevant to the subject performance applied.

2. A handover protocol will be drawn up on the handover and acceptance of performance under this contract, which will be signed by both contracting parties. The Customer is responsible for damage caused to the System after delivery and acceptance of performance, while this fact does not relieve the Supplier of responsibility for damage caused by performance defects.

3. The handover and takeover protocol will be drawn up by the contracting parties immediately after the end of the takeover procedure and will include, in particular:

- identification data of the System and information on its commissioning and implementation of training
- assessment of delivery quality
- the Customer's statement that he accepts the transferred System
- list of attachments

4. Before the start of the acceptance procedure, the Supplier is obliged to prepare the documents necessary for the operation of the System and to hand them over to the Customer, or to the end user, all in English.

5. The Supplier shall invite the Customer in writing no later than 5 working days before the scheduled handover date. On the day specified in the notice, the Customer is obliged to start a general inspection of the System in the presence of the Supplier's representatives. After the inspection, the customer compiles a list of defects found during the inspection.

6. The supplier is obliged to remove the defects found during the inspection within the period determined by the agreement of both contracting parties, but no later than within 30 calendar days.

7. A final handover protocol confirmed by both contracting parties will be drawn up on the removal of all defects. In it, the Customer declares that the defects have been eliminated and that it considers the Supplier's obligation to deliver the System to be properly fulfilled.

8. The supplier undertakes that the delivered performance will not have legal defects and that it will not be bound by any reservation of ownership right at the time of acceptance, with the exception of the reservation of ownership right according to this contract.

VII. WARRANTY

1. The Supplier is responsible for the fact that the delivered System will have the properties specified by this contract, technical documentation and technical standards applicable to the given type of System.

2. For the delivered System, the Supplier provides a warranty period of 30 months from the date of signing the handover protocol by both contractual parties.

3. The warranty period is extended by the time when the System delivered in accordance with this contract could not be properly used for the purpose for which it is intended, and by the time necessary to eliminate the defect or repair the System as part of the warranty service.

4. The customer is obliged to inspect and check the System properly upon taking over. The Customer is obliged to complain about delivery defects immediately after discovering them.

5. The warranty does not cover defects caused by:
   - By operating the System contrary to the instructions for use and purpose of the System,
   - mechanical damage caused by rough and unprofessional handling.

6. Goods complaints must be made in writing and must contain:

- designation of the claimed System,
- description of the defect,
- requirements for resolving complaints, or claimed claim.

7. The complaint is considered to have been made on the day when the written notification about it was delivered to the Supplier.

8. The supplier is obliged to remove the defect covered by the warranty no later than 30 days after the complaint is made.

9. Contact for warranty and post-warranty service: Dr. Martin E. Fermann

VIII. SANCTIONS

1. If the supplier fails to meet the offered delivery time, the contracting authority will be entitled to a contractual penalty of:
   - EUR 50 for each started day of delay for delays of between 1 and 30 days;
   - EUR 100 for each started day of delay over 30 days.

2. If the supplier fails to meet the deadlines under the warranty, the contracting authority will be entitled
   to a contractual penalty of:
   - EUR 10 for each started day of delay in delivering the defect diagnosis
   - EUR 50 for each started day of delay in delivering the repaired equipment or replacement equipment for free loan.

3. At the same time, the contracting authority shall have the right to withdraw from the contract within the range of warranty in the event of a delay in delivering the repaired equipment or equipment for free loan of more than 30 days. In such case the contracting authority shall also be entitled to a refund of the price of the warranty not provided:
   - at the rate of 0,5 % of the total purchase price of the Equipment for each month of not provided warranty, i.e. for each month remaining till the end of the originally agreed warranty (if the price of the warranty is included in the purchase price of the Equipment) or
   - at a pro rata rate of the total price of the warranty for each month of not provided warranty, i.e. for each month remaining until the end of the originally provided warranty (if the price of the warranty is set separately).

4. If the supplier fails to meet the commitments under the technical support (see paragraph 3.5. of this Tender Documentation), the contracting authority will be entitled to a discount of 1 % from the monthly price for the technical support for each case of breach.
5. The contracting authority shall be entitled to set off its legitimate financial claims arising from paragraphs 1. to 3. of this article against its payable financial obligations towards the supplier.

IX. GDPR

1. Both contracting parties undertake to process personal data for the purpose of fulfilling the contractual relationship in question, in accordance with Act 110/2019 Coll., on the processing of personal data, as amended (hereinafter referred to as the "Act"), and the Regulation of the European Parliament and the Council (EU) No. 2016/679 (hereinafter referred to as "GDPR").

2. Personal data will be processed by the contracting parties only to the extent necessary for the fulfillment of the above-mentioned purpose and only for the time necessary to achieve the above-mentioned purposes, but no longer than for the period determined by the relevant legal and internal regulations and in accordance with them.

3. Each of the contracting parties is an administrator within the meaning of the provisions of applicable legal regulations. Only the administrator and persons who are in an employment relationship with him or the processor based on a contractual relationship with the administrator and only for the aforementioned processing purposes have access to personal data. Access to and handling of personal data processed by each of the administrators is subject to the internal regulations of the administrator in question.

4. The contracting parties are obliged to inform data subjects (e.g. contact persons) that their personal data may be processed for the purpose of fulfilling the contract in question. At the same time, they are obliged to inform data subjects about the possibility of exercising their rights with the administrator, namely at:
    - the right to access, correct or delete personal data, the right to limit processing and the right to object to unlawful processing;
    - the right to file a complaint with the supervisory authority.

X. LEGAL PROTECTION OF DELIVERY OF THE SYSTEM

The delivery of the System according to this contract is subject to the legal protection in the form of insurance as provided by the supplier.

XI. FINAL PROVISIONS

1. This contract governs all rights and obligations between the parties and may only be amended by written agreement.

2. The invalidity of any provision of this contract does not cause the invalidity of other parts of the contract.

3. The contracting parties will resolve any disputes regarding the performance of the contract primarily through mutual negotiations. In the event that the dispute cannot be resolved by agreement, the disputed matter will be resolved through court proceedings. All disputes arising in this way will be resolved according to Czech law.

4. In accordance with the provisions of § 89a of Act No. 99/1963, the Code of Civil Procedure, as amended, the contracting parties concluded an agreement, or have agreed on other local

jurisdictions of the 1st instance court. The locally competent court is the 1st instance court, in whose district the Customer is based.

5. In connection with the fulfillment of the subject matter of this contract, the contracting parties undertake to ensure the protection of the right to trade secrets in accordance with the relevant provisions of the Civil Code whenever one, the other or both parties together designate information as trade secrets or as confidential information or for those materials that are already marked as such. This information will not be disclosed to a third party without the written consent of the other contracting party and will effectively ensure that it is not misused. The obligation of confidentiality is valid both during the performance of this contract and after its termination, with consequences that are determined by the legal order in the event of a threat or violation of rights and obligations.

6. Both contracting parties agree to the publication of this contract, including all possible amendments according to the Act No. 134/2016 Coll., on Public Procurement (hereinafter referred to as "Public Procurement Act"), and to the publication of other information related to the performance of this contract in accordance with the Public Procurement Act.

7. The contract becomes valid and effective on the date of signature of both contracting parties. The customer will ensure publication.

8. The provisions of the Civil Code shall apply to the rights and obligations of the parties, which are not expressly regulated by this contract.

9. This contract is drawn up either in electronic form or in paper form in two identical copies with the validity of the original, of which each of the contracting parties will receive one copy.

10. The contracting parties entered into this contract voluntarily, seriously, comprehensibly and definitely after prior discussion of the contractual arrangements, which they confirm with their signatures.

The following annexes are an integral part of this contract:

- Annex No. 1: Specification of the subject of performance – Technical and price part of the Supplier´s bid

For the supplier:
On ..... on ....Ann Arbor, Feb. 20. 2025

[redacted]

Dr. Martin E. Fermann

For the customer: 21-02-2025
In Praha on .....

[redacted]

Ing. Jakub Papírník
director

7

cesnet

CESNET, z.s.p.o.
Generála Píky 430/26
160 00 Praha 6
IČ: 63839172
DIČ: CZ63839172

COVER SHEET OF THE BID

Public contract:	**„ System for conversion of optical frequencies of telecommunication band to radio frequency domain (Frequency Comb System) “**
Contracting authority:	**CESNET, interest association of legal entities** Generála Píky 430/26, 160 00 Prague 6 ID No.: 63839172

Identification data of the supplier - participant:		
Participant (business name or name)	IMRA America Inc.	
Registered seat (in the case of a natural person, the place of business)	Lansing, Michigan, USA	
Legal form	limited liability company	
ID/registration number	38-2931648 (US tax registration number)	
Tax ID/registration number	38-2931648 (for US)	
Public register entry	Not applicable	
Data box identifier	Not applicable	
Web	www.imra.com	
Contact person of the participant		
Name/surname	Martin Fermann	
Phone	+1 [redacted]	
E-mail	[redacted]	
Evaluated criteria		
Total bid price (excl. VAT) (see paragraph 9.3. of the tender documentation)	175,000 USD	Of which: Purchase price: 175,000 USD Price for warranty (for the whole offered period; if not included in purchase price): 0 USD (= per month: xxx,- CZK / EUR / USD / GBP) Price for technical support per month: 0 USD
Offered delivery time (see paragraph 9.4. of the tender documentation)	**20 weeks**	
Offered warranty period (see paragraph 9.5. of the tender documentation)	30 **months**	
Name of the person authorized to act on behalf of the participant	Martin E. Fermann	
Details of the authorisation	Martin Fermann is a VP of IMRA America	
Date	Sept. 6th, 2024	

Annex 4 to the tender documentation

Checklist of technical requirements for the Equipment

Supplier:	IMRA America Inc.
Public contract:	System for conversion of optical frequencies of telecommunication band to radio frequency domain (Frequency Comb System)

Technical requirements for the Equipment			
		YES / NO	Value / Details
1	**Modular rack system**	Yes	Size = 11U, see attached copy of website for a similar system in Fig. 1.
2	**Including locking electronics**	Yes	Lock box ULC included, see attached copy of the ULC website in Fig. 2.
3	**Repetition rate at least 200 MHz**	Yes	200 MHz, see attached copy of description of Ecomb 200R on website in Fig. 3.
4	**Repetition rate tuning range at least 400 kHz**	Yes	> 500 kHz, see attached copy of description of Ecomb 200R on website in Fig. 3.
5	**F_{rep} control bandwidth at least 300 kHz**	Yes	>500 kHz, see transfer function in Fig. 4.
6	**Comb linewidth 1 Hz after locking to an appropriate optical reference**	Yes	< 1 Hz, see Fig. 5.
7	**f_{ceo} tuning range at least 250 MHz**	Yes	> 300 MHz, see table 1.
8	**f_{ceo} modulation bandwidth at least 300 kHz**	Yes	300 kHz, see transfer function in Fig. 6.
9	**Integrated f_{ceo} detection**	Yes	Included in Ecomb 200R box (3U), see attached copy of description of Ecomb 200R on website in Fig. 3.
10	**PM fiber-coupled output with optical connector FC/APC**	Yes	1 m pigtail length, see attached copy of description of Ecomb 200R on website in Fig. 3.
11	**Output wavelength range 1520 – 1580 nm**	Yes	See spectrum in Fig. 7.
12	**Possibility to lock f_{rep} to RF and optical reference**	Yes	Standard with ULC lock box, see attached copy of the ULC website in Fig. 2.
13	**f_{ceo} lock to RF reference**	Yes	Standard with ULC lock box, see attached copy of the ULC website in Fig. 2.
14	**Mounting 19" rack max. 14U**	Yes	Size = 11U

15	**Interface for computer control**	Yes	IMRA AED software provided, see Fig. 8.
16	**Power supply AC 230V**	Yes	

* Please indicate in the empty cells whether the offered Equipment meets the technical requirements and, where applicable, the value according to the Equipment characteristics.

Further documentation:

A) Technical support:

IMRA will provide technical support of its delivered system according to the requirements on CESNET, specifically:

1. IMRA provides technical support for at least **2 years** starting on the day of delivery (handover). Price for technical support is included in the total bid price.

2. Within its technical support, comprehensive documentation for hardware and software operation and detailed operation manuals are provided.

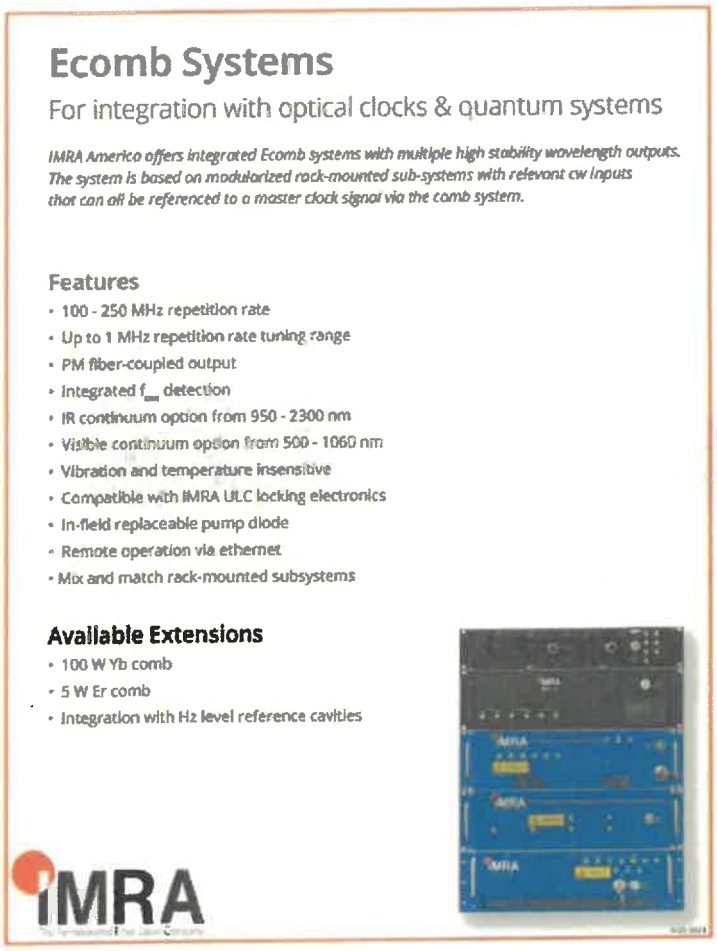
3. A response time for remote support within 5 business days is assured.

4. Remote support for the initialization of the system and operator training for at least one workday is assured.

5. Regular security patches, software updates and system upgrades to ensure ongoing security and performance will be provided.

6. IMRA provides an option of chargeable remote diagnostics and reconfiguration, or on-site visit from a technician.

B) Documentation related to technical performance



Ecomb Systems

For integration with optical clocks & quantum systems

IMRA America offers integrated Ecomb systems with multiple high stability wavelength outputs. The system is based on modularized rack-mounted sub-systems with relevant cw inputs that can all be referenced to a master clock signal via the comb system.

Features

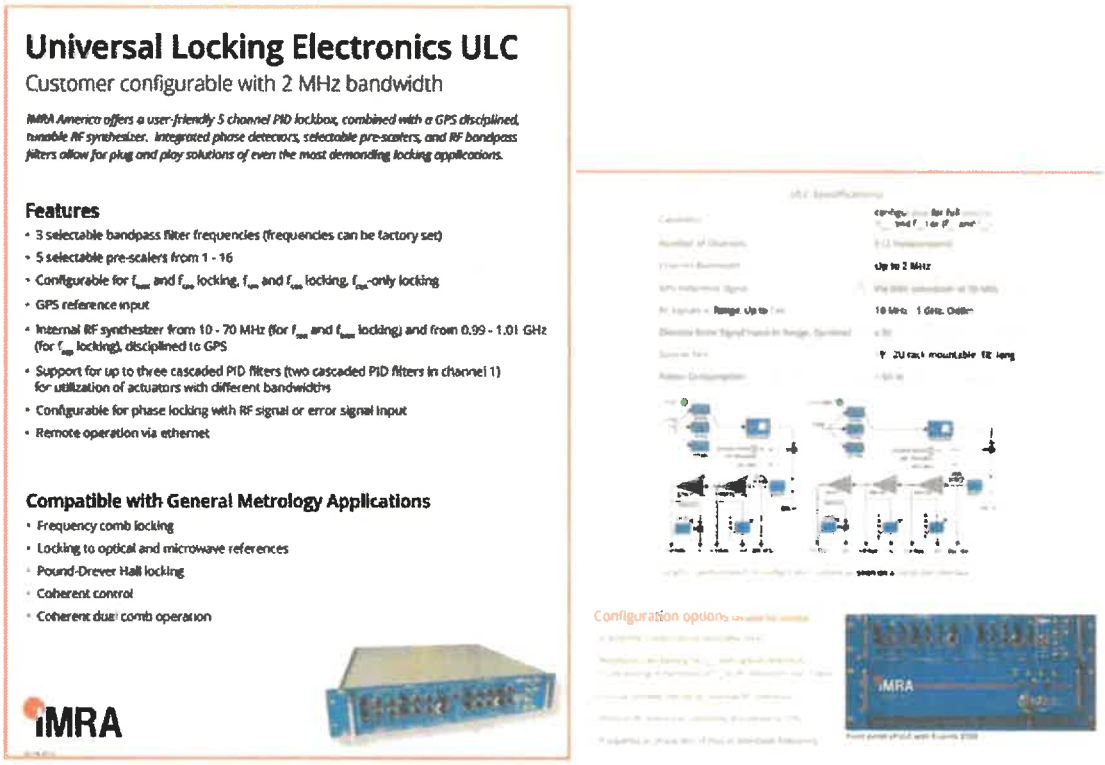
- 100 - 250 MHz repetition rate
- Up to 1 MHz repetition rate tuning range
- PM fiber-coupled output
- Integrated f_{ceo} detection
- IR continuum option from 950 - 2300 nm
- Visible continuum option from 500 - 1060 nm
- Vibration and temperature insensitive
- Compatible with IMRA ULC locking electronics
- In-field replaceable pump diode
- Remote operation via ethernet
- Mix and match rack-mounted subsystems

Available Extensions

- 100 W Yb comb
- 5 W Er comb
- Integration with Hz level reference cavities

IMRA

Fig. 1) Description of rack-mounted Ecomb systems from IMRA website.



Universal Locking Electronics ULC

Customer configurable with 2 MHz bandwidth

IMRA America offers a user-friendly 5 channel PID lockbox, combined with a GPS disciplined, tunable RF synthesizer, integrated phase detectors, selectable pre-scalers, and RF bandpass filters allow for plug and play solutions of even the most demanding locking applications.

Features

- 3 selectable bandpass filter frequencies (frequencies can be factory set)
- 5 selectable pre-scalers from 1 - 16
- Configurable for f_{beat} and f_{ceo} locking, f_{rep} and f_{ceo} locking, f_{rep}-only locking
- GPS reference input
- Internal RF synthesizer from 10 - 70 MHz (for f_{ceo} and f_{beat} locking) and from 0.99 - 1.01 GHz (for f_{rep} locking), disciplined to GPS
- Support for up to three cascaded PID filters (two cascaded PID filters in channel 1) for utilization of actuators with different bandwidths
- Configurable for phase locking with RF signal or error signal input
- Remote operation via ethernet

Compatible with General Metrology Applications

- Frequency comb locking
- Locking to optical and microwave references
- Pound-Drever Hall locking
- Coherent control
- Coherent dual comb operation

iMRA

Up to 2 MHz

Configuration options

iMRA

Fig. 2) Specifications of IMRA ULC lock box, taken from IMRA's website.

Ecomb-200/250R: Erbium Fiber Comb

Rack-mounted, ultra-low noise

IMRA America offers a high performance frequency comb for advanced metrology applications, such as optical clocks and comb spectroscopy.The rack-mounted comb integrates easily, especially where a portable system is premium. An all-erbium platform, the frequency comb comes with fiber-coupled outputs and provides ultra-low phase noise, timing jitter, and superior frequency stability.

Features

- 200/250 MHz repetition rate
- 500/600 kHz repetition rate tuning range
- High coherence 1050 - 2200 nm continuum
- PM fiber-coupled output
- Vibration and temperature insensitive
- Integrated f_{ceo} detection
- Compatible with IMRA ULC locking electronics
- Remote operation via ethernet

Available Extensions

- 2 W Er comb
- 5 W Tm comb
- High coherence visible continuum
- Clock wavelength outputs selectable from 530 - 1200 nm
- > 10 mW mid-IR comb
- Radiation-hardened design
- OEM versions

IMRA

Fig. 3) Description of Ecomb 200/250R.

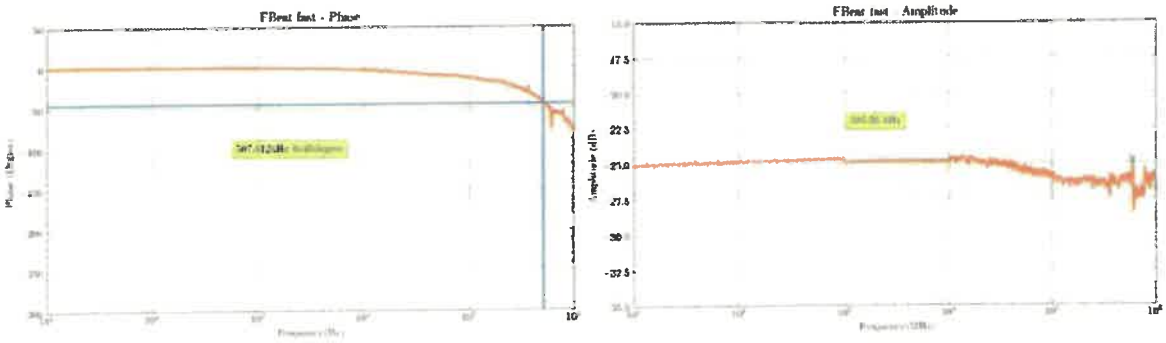


Fig. 4) Typica frep control phase and amplitude transfer function of Ecomb 200R. The phase delay is 45 deg. at 500 kHz, corresponding to a control bandwidth > 500 kHz.

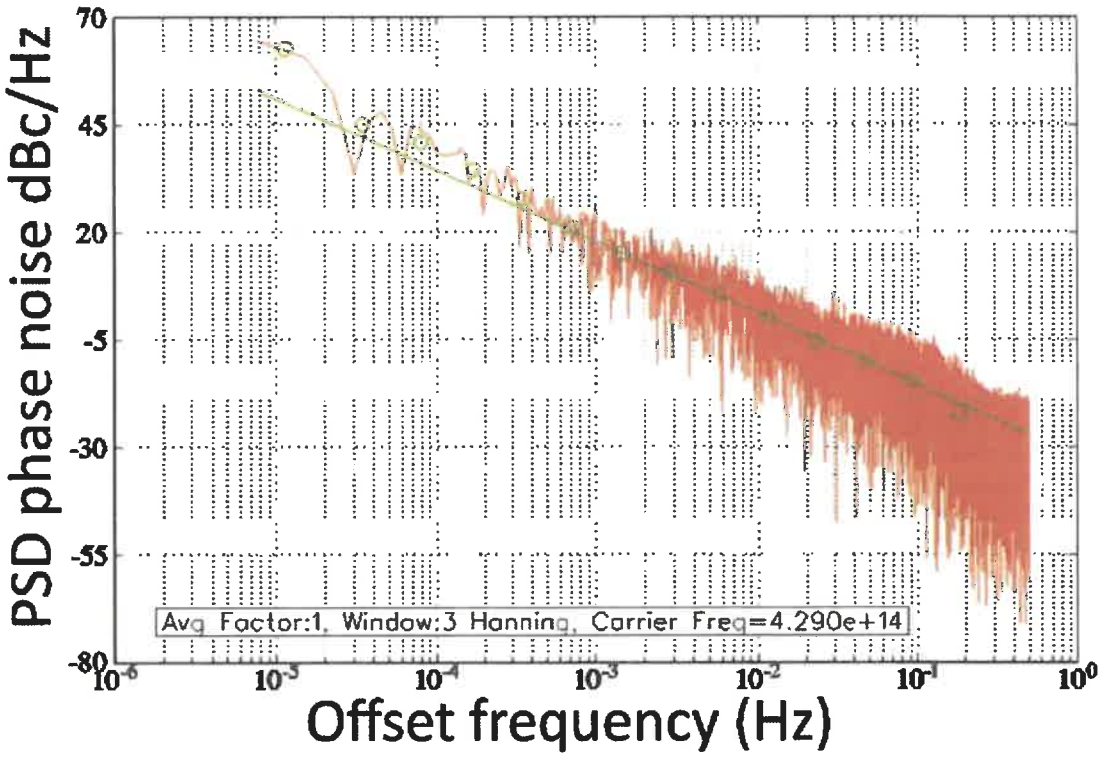


Fig. 5) Out of loop phase noise between a comb line selected from a typical Ecomb 200R and an optical Hz level cavity, the estimated linewidth < 1 Hz.

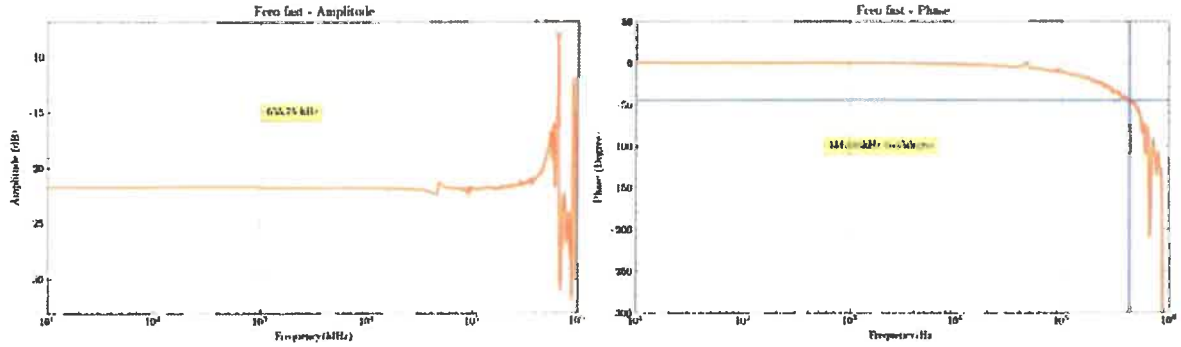


Fig. 6) Typica fceo control amplitude and phase transfer function of Ecomb 200R. The phase delay is 45 deg. at 450 kHz, corresponding to a control bandwidth > 400 kHz.

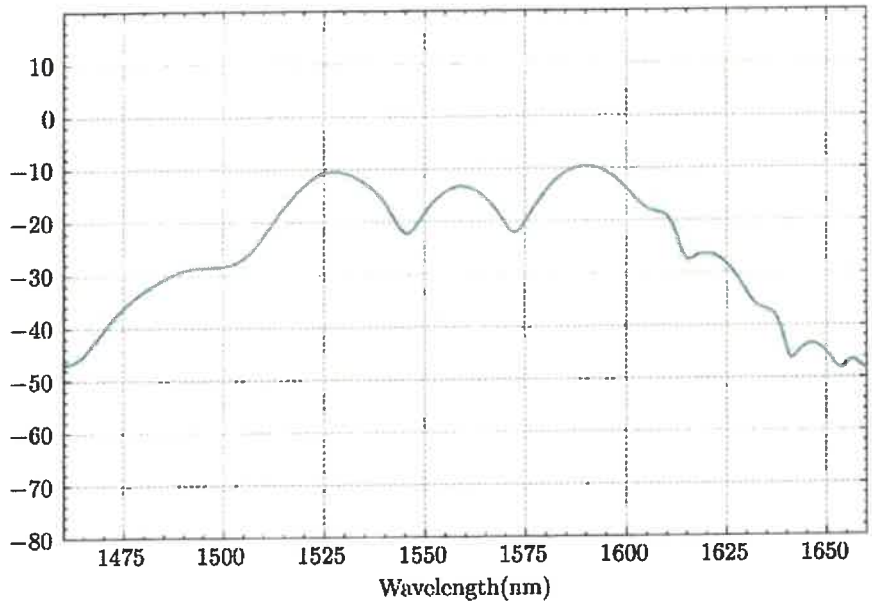


Fig. 7) Typical comb output spectrum on a logarithmic scale.

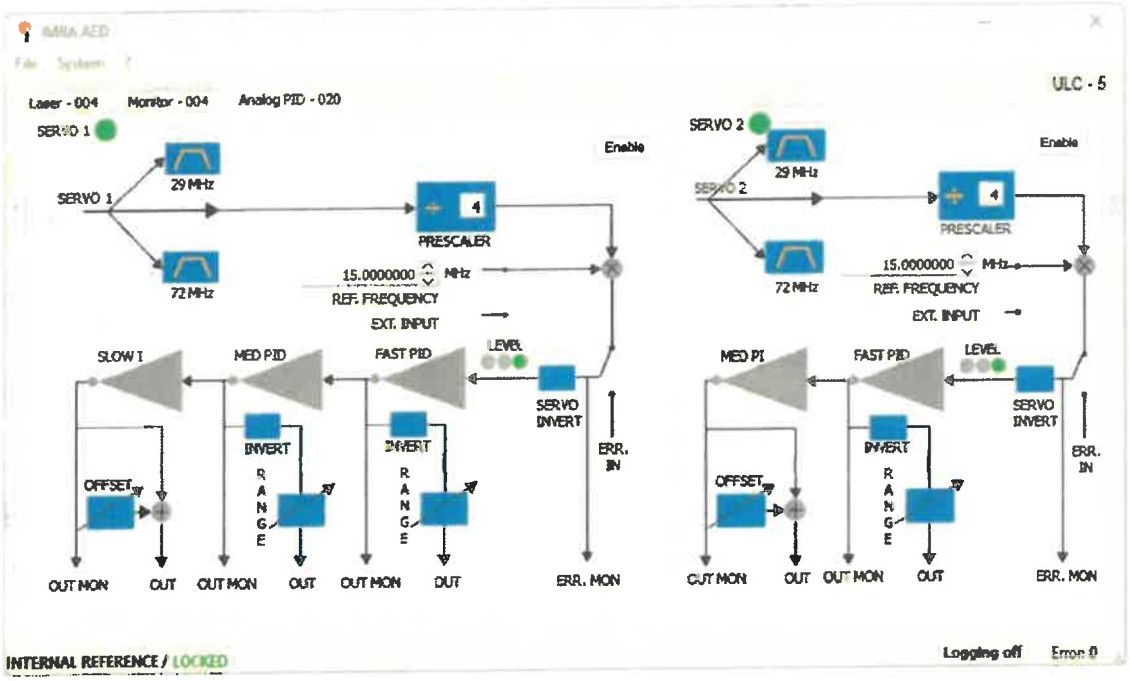


Fig. 8) User interface for control of IMRA's lock box ULC.

FCEO tuning range	Fceo actual location	FCEO S/N	OSC current
0 MHz	50 MHz	45 dB	900 mA+ 1400 mA
50 MHz	0 MHz	45 dB	1010 mA+ 1400 mA
100 MHz	50 MHz	45 dB	1110 mA+ 1400 mA
150 MHz	100 MHz	45 dB	1270 mA+ 1400 mA
200 MHz	150 MHz	45 dB	1340 mA+ 1400 mA
250 MHz	200 MHz	45 dB	1440 mA+ 1400 mA
300 MHz	150 MHz	45 dB	1500 mA+ 1400 mA

Table 1) Fceo tuning range of typical Ecomb 200R, fceo tuning is performed by changing by changing the oscillator pump diode current. The fceo S/N ratio stays the same during fceo tuning. A video of fceo tuning can be submitted upon request.