

TERMS AND CONDITIONS

International Public Bidding

CPI 017-2014-PUCP

**Procurement of Scientific Equipment for Radio
Science Laboratory**

JULY 2014

**LIMA- PERU
TERMS AND CONDITIONS**

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ADMINISTRATIVE TERMS AND CONDITIONS

1. General Terms

1.1. Calling Entity

The Pontificia Universidad Católica del Perú, from now on **PUCP**, located at Universitaria Avenue N° 1801, San Miguel District, Lima 32, Perú.

1.2. Purpose

The present process aims at the selection and acquisition of equipment for Radio Science.

1.3. Process Schedule

Process stages	Dates
Delivery of Terms and Conditions	Wednesday, July 9, 2014
Place of delivery of Terms and conditions	Terms and conditions shall be published at PUCP webpage. Previously, a notice shall be published in Official Gazette El Peruano to communicate this bidding
Terms and conditions Remarks	Until Monday, July 21, 2014
Terms and conditions Integration	Until Friday, July 25, 2014
Submission of inquiries	Until Monday, August 4, 2014 to e-mail aholgado@pucp.pe with a copy to e-mails jsolis@pucp.edu.pe and rcastellanos@pucp.pe
Acquittal of inquiries	Wednesday, August 13, 2014 via e-mail
Receipt of tenders	Until 10:00h Friday, August 22, 2014 at the Rector's Technical Consultancy Office (in printed and electronic form) or via e-mail to aholgado@pucp.pe with a copy to e-mails jsolis@pucp.edu.pe and rcastellanos@pucp.pe
Correction of Technical Tender (if necessary, bidders shall be summoned)	Until Wednesday, August 27, 2014
Awarding of Contract	Monday, September 1, 2014

1.4. Reference Budget

Open amount.

1.5. Contracting System

Lump sum contract for each item. Each item can have different components. Some characteristics are stated in the technical specifications (Annex 1).

However PUCP holds the right to buy from each and any bidder certain components from a determined item, and the other components from another or other bidders, according to this we will request different kinds of prices for all components, prices for when the components are bought separately and prices for when the components are bought as a full set of one item (See templates 03A and 03B).

1.6. Requirements to be a Bidder

- 1.6.1.** Companies legally organized in Peru or in countries members of the Inter-American Development Bank may appear as bidders, independently (no partnerships are allowed). Foreign companies shall accredit existence as per rules of their country of origin.
- 1.6.2.** The bidder shall issue an express opinion based on business or kinship relations with **PUCP** staff, as well as failures committed or penalties imposed during the last three (3) years.
- 1.6.3.** In no case, **PUCP** may enter into any agreement involving, on the bidder side, the use of privileged information, acts of unfair competition or conflict of interests or with the spouses, common law partners, cohabitants or relatives to the fourth degree of kinship or second degree of friendship of any **PUCP** officials involved in this bidding.

1.7. Disqualifications and Impeachments

- 1.7.1.** Legal entities in which some of their partners or legal agents are under the conditions set forth in paragraph 1.6.3. may not appear

as bidders for this bidding, unless they are openly held corporations or equivalent in the event of foreign companies.

- 1.7.2.** If subsequently to the bidding, it is verified that the winning bidder has any of the above-mentioned disqualifications, he will lose those rights he might have acquired based on his involvement and the corresponding purchase order shall be annulled, if already issued, so that **PUCP** shall be expressly empowered to award goods upon the following bidder according to the list of merits.

1.8. Legal Grounds

This bidding shall be governed as follows:

- Code of Ethics and Good Governance of PUCP, available at webpage <http://www.pucp.edu.pe/documento/pucp/codigo-etica-2-digital-b.pdf>
- Applicable Peruvian rules.
- IDB Rules GN-2349-9 shall be applicable additionally for those provisions not stated in this terms and conditions. These rules may be seen at <http://www.iadb.org/es/banco-interamericano-de-desarrollo.2837.html>

Obligations and rights of the parties shall be subject to the legal grounds above.

1.9. Commitment of the Bidders

The Bidder, for filing a tender, states to be subject and inure tacitly to rules contained in the Terms and Conditions, as well as clarifications or amendments, without being able to file any claim for issues arisen out of the construction thereof by **PUCP**.

1.10. Means of Payment

1.10.1. Companies domiciled in Peru

PUCP shall pay for goods and services hired upon thirty (30) days as from the receipt of invoice issued by the **winning bidder**, upon obtaining the delivery release of procured goods and services.

However, the **winning bidder** may request up to 40% in advance upon delivery of an advance payment guarantee letter (see conditions in paragraph 6.1) expiring after forty (40) days as from the date established for delivery of procured goods and services. Advance payment shall be made five (5) business days as from the delivery of that guarantee letter and the corresponding invoice.

1.10.2. Foreign companies

The payment shall be made by means of a letter of credit, to be effected upon submission of the shipment documents of purchased goods.

Foreign companies may also elect to receive 40% in advance referred to in paragraph 1.10.1, under the same conditions stated therein.

Any other means of payment proposed by the bidder shall be subject to an agreement between the parties.

1.11. Penalty for delay in delivery of goods

If a delayed delivery of goods under this bidding, **PUCP** shall apply a penalty of 1% of the contracted amount for each day of delay to the supplier up to a maximum amount of ten per cent (10%) of the contract price.

If the maximum penalty amount is covered, PUCP may render the purchase order issued null and enforce advance guarantee letters and compliance certificates referred to in paragraphs 6.1 and 6.2 of this Terms and Conditions.

1.12. Final provisions

Issues not set forth in this Terms and Conditions shall be governed by the rules set forth in paragraph 1.8.

2. Inquiries Stage / Terms and Conditions Remarks

- 2.1.** Bidders may make remarks to the Terms and Conditions and submit them to e-mail aholgado@pucp.pe with a copy to e-mails jsolis@pucp.edu.pe

and rcastellanos@pucp.pe within the terms indicated in the bidding schedule.

2.2. If there is any remark to the Terms and Conditions, **PUCP** shall reply them within the term stated in the bidding schedule and publish integrated terms and conditions in the same portal where the original terms and conditions were published.

2.3. Inquiries about these integrated Terms and Conditions shall be received within the terms indicated in the bidding schedule, according to the following form:

Terms and conditions reference	Background /justifications (Annexes may be included)	Consultation/ Remark (no more than 5 lines)
Page, number, section, paragraph or annex		

2.4. Acquittal of these inquiries shall be informed to all bidders to the e-mail of the legal agent stated in Form 01 and it will make up these Terms and Conditions.

3. Submission and Evaluation of Tenders

3.1. Submission of Tenders

3.1.1. Tenders may be submitted in printed form (including a copy in electronic form) to the Rector's Office Technical Consultancy Office located at Av. Universitaria 1801, San Miguel, Lima 32, Peru or e-mail aholgado@pucp.pe with a copy to e-mails jsolis@pucp.edu.pe and rcastellanos@pucp.pe on the date established in the bidding schedule.

3.1.2. The bidder, upon filing his tender, accepts implicitly all legal provisions mentioned in these Terms and Conditions and

unconditionally submits thereto, waiving expressly to file any claim for issues arisen out of the construction thereof by **PUCP**.

- 3.1.3.** The tender should not contain text between lines, erasures, crosses out or amendments.
- 3.1.4.** Submission of adulterated, fraudulent or false documents due to any reason attributable to the bidder, even though they are detected subsequently to the receipt of tenders, shall give raise to the bidders' disqualification, although the corresponding purchase order had been issued.

3.2. Technical – Economic Conditions

- 3.2.1.** The bidder shall submit his technical-economic tender taking into account all those characteristics stated in the technical specifications attached hereto (Annex 1) for the item or items in which he is involved.
- 3.2.2.** **PUCP** may extend the date for submission of tenders stated in paragraph 1.2. The new date shall be communicated to all bidders no later than two (2) days in advance of the date set forth in the bidding schedule for submission of tenders.
- 3.2.3.** To facilitate the exam, evaluation and comparison of tenders, **PUCP** may, at its own discretion, request any bidder to clarify the tender. The request for clarification and answer shall be made via email to the contact email indicated in Form No. 01 of the tender. Changes in price or material issues of the tender shall not be covered by these clarifications.
- 3.2.4.** **PUCP** reserves the power to cancel the selection process until before the awarding of the contract, without mentioning any cause.
- 3.2.5.** The currency of Tenders shall be Nuevos Soles. However, in the event of foreign companies or those in which tendered goods are not of national manufacture, the tender may be filed in US dollars.

3.3. Contents of Tenders

3.3.1. Contents of Technical Tender

- a) Credentials and certificates
 - a.1) Sworn statement of business information according to Form No. 01
 - a.2) Sworn statement of the bidder according to Form No. 02
- b) Documents referred to the purpose of the contract
 - Detailed description of the tendered good or goods according to the Technical Specifications.
- c) Commitment to perform the delivery of goods within the proposed term, according to Form No. 04
- d) Documents referred to technical evaluation factors for each item in which the bidder is involved.
 - d.1) Factor 1 Tender Term
 - d.2) Factor 2 Business Guarantee
 - d.3) Factor 3 Technical Improvements
 - d.4) Factor 4 Experience and Prestige
 - d.5) Factor 5 Training
- e) In the event of printed tenders, an electronic mean (CD, USB or other) shall contain the above-mentioned information.

3.3.2. Contents of Economic Tender

- a) Form of Economic Tender (Form No. 03)
 - A form shall be submitted for each item in which the bidder is involved.
- b) Detailed economic tender, if applicable, in the form desired by the bidder.

3.4. Evaluation of Tenders

3.4.1. Technical Evaluation

During the evaluation process, **PUCP** shall verify the technical documentation handed-over. Only information submitted according to the forms handed-over together with the tender shall be taken into account.

A Technical Tender failing to meet the requested requirements shall be disqualified and; therefore, its corresponding economic tender shall not be assessed.

In the event that, from the review of the Technical Tender, form defects are inferred in the submitted documents, such as errors or omissions that may be corrected which do not amend the scope of the technical tender, the bidder shall be requested to change the tender, granting upon him a term two (2) business days at most to correct such an error or omission.

PUCP reserves the right to verify the economic and financial status of the bidder in risk centers, Chambers of Commerce, international lists and others. **PUCP** may reject the tender if the bidder is found to be in a financial status which fails to ensure **PUCP** the compliance with his obligations.

3.4.2. Economic Evaluation and Awarding of the Contract

The economic evaluation shall be purported to rate the economic tender of the bidders, the technical tender of which was found to be in agreement with and rated enough to proceed to the second stage. An evaluation shall be made for each item, independently.

However, on items 1 and 7, which include different components, **PUCP** holds the right to buy all components from one bidder or from more than one bidder. According to this we will request different kinds of prices for all components, prices for when the components are bought separately and prices for when the components are bought as a full set of one item (See templates 03A and 03B).

PUCP shall advise of the result of the technical-economic evaluation to all bidders at the email stated in Form No. 01.¹

PUCP shall advise of the awarding to the winning bidders of each item through an email addressed to the email stated by each bidder in Form No. 01. Decision made by **PUCP** shall not be subject to review requests by the bidders.

4. Evaluation System

¹ To advise of the result means to communicate the order of merit of the different bidders regarding each item of the bidding.

4.1. Technical Evaluation (Technical Tender)

4.1.1. Compliance with Reference Terms and Technical Specifications

During this stage, it shall be seen that the technical tender of the bidder meets the technical specification of Annex 1. If the above-mentioned technical specifications are not met, the tender shall be disqualified.

4.1.2. Factors of Technical Evaluation (100 points at most)

a) Factor Delivery Term

20 points shall be awarded upon the lesser term for the tender. The other bidders shall receive a score inversely proportional to the tender term.

b) Factor Business Guarantee of the bidder and/or manufacturer (against manufacture defects and hidden faults)

10 points shall be awarded for each year of guarantee additional to the requested term under reference terms (20 points at most.)

c) Factor Technical Improvements

5 points shall be awarded for each tendered technical improvement the evaluation committee deems relevant for the selection process (4 improvements at most.)

d) Factor Bidder's Experience and Prestige

20 points shall be awarded based on the list of clients to whom the bidder sold equipment similar to the requested one. Therefore, the bidder shall submit, in each case, any document proving that. The selection committee shall assess the submitted documentation and the score deemed appropriate shall be given to the bidder.

e) Factor Training

The committee shall assess the training plan submitted by the bidder and it shall rate it with a score from 0 to 20 points. A greater score shall be given to bidders offering use and training manuals in Spanish, as well as face-to-face training in Peru.

Summary

Consequently, maximum scores of technical evaluation factors for each item shall be as follow:

Technical Evaluation Factors	Maximum score
<i>Delivery Term Improvement</i>	20
<i>Business Guarantee Improvement</i>	20
<i>Technical Improvements</i>	20
<i>Experience and Prestige</i>	20
<i>Training</i>	20
Total	100

4.2. Economic Evaluation (Economic Tender)

The maximum score of the economic tender (PMPE) for each item shall be one hundred (100) points and it will be given to the tender which offers a lesser amount (cost) for such an item. Scores of other tenders for the same item shall be given inversely proportional to the tender amount, according to the following formula:

$$P_i = (O_m \times PMPE) / O_i$$

Where:

i = Tender

P_i = Economic tender score i

O_i = Economic tender amount i

O_m = Lesser economic tender amount

PMPE = Maximum score of economic tender

Score calculation shall be made with two decimals, rounding the second decimal to the immediate superior one if the third decimal is equal to or more than five (5).

4.3. Awarding of the good

Awarding shall be made independently for each item subject matter of this public bidding. However, more than one item may be awarded upon the same bidder. However, on items 1 and 7, which include different components, **PUCP** holds the right to buy all components from one bidder or from different bidders partially. This will allow bidders to participate whether or not they have all the components of a determined item.

For the awarding, all elements of the tender shall be taken into account under the following terms:

Evaluation of technical tender of tendered goods shall meet, at least, those characteristics stated in the reference term or similar ones. On the other side, at the criteria of the selection committee, it might be disqualified. This evaluation shall not grant any score.

Evaluation of factors requested in 4.2.1. shall give a score to be considered as technical score.

Total score for awarding of the contract shall be obtained based on the technical and economic score.

Thus, the total score shall be obtained using the following formula:

$$PTP_i = 0,6 PT_i + 0,4 PE_i$$

Where:

PTP_i = Total score of the bidder i

PT_i = Score for technical evaluation of the bidder i

PE_i = Score for economic evaluation of the bidder i

For each item, a priority order from the top to the bottom of bidders submitting a tender in that item (order of merit) shall be prepared. The bidder obtaining the greater score shall be the first one.

Nevertheless, for items 1 and 7, the economic evaluation will be done also at components level to determine their purchase.

5. Contract

5.1. Procedure

- 5.1.1. **PUCP** shall issue a purchase order to the **winning bidder** of each item (**awarded party**) to procure goods and services. These terms and conditions and technical – economic tender of the bidder shall be considered Appendixes to that purchase order.
- 5.1.2. The **winning bidder** is obliged to deliver goods and services detailed in the purchase order, on the date and under the conditions set forth therein.
- 5.1.3. For goods manufactured abroad, **PUCP** reserves the right to inspect the purchased goods, prior to the shipment, at the place of origin, so in that case it is indispensable to sign a certificate of compliance before shipment.
- 5.1.4. **PUCP's** decision to make this inspection prior to the shipment shall be announced to the **winning bidder** no less than fifteen (15) days in advance to the date scheduled for the shipment.

Travel expenses giving raise to this inspection shall be borne by **PUCP**.

- 5.1.5.** If the purchase includes training courses abroad, these shall be given preferably in Spanish or with a simultaneous translation into Spanish. Expenses involving that training, except for travel tickets and accommodations expenses of **PUCP** personnel to be trained, shall be borne by the **winning bidder**.
- 5.1.6.** **PUCP** shall issue a good compliance certificate (Warehouse entry note) once those goods are verified according to the conditions and characteristics established in the purchase order. For goods, compliance shall be given by the **PUCP** Warehouse Area within a term of three (3) calendar days, at most, as from the following day on which the bidder delivers the documents supporting the delivery of goods at the warehouse. For services (training and education), compliance shall be stated by the user.
- 5.1.7.** The issue of that delivery compliance certificate shall not release the **winning bidder** from his liability for hidden defects found in the delivered goods.

5.2. Quality

- 5.2.1.** Delivered goods shall meet the technical standards and/or specifications kept in our purchase order.
- 5.2.2.** **PUCP** reserves the right to inspect the quality of goods delivered, components used and manufacture process. The supplier shall grant all facilities to conduct that inspection as per paragraph 5.1.3. **PUCP** may delegate that inspection to a third party of its choice.
- 5.2.3.** Guarantee of quality and good operation of purchased goods shall be valid as from the day following the date of issue of the corresponding compliance certificate.

5.3. Prices

- 5.3.1.** Prices established in the purchase order are fixed, unless any readjustment clause is expressly stated otherwise.
- 5.3.2.** If any readjustment clause is kept on the purchase order, it shall govern only up to the delivery date set forth in this purchase order.

- 5.3.3.** In any case, if for any reason or cause (except for force majeure events) goods are delivered after to the date stated in the purchase order, the price readjustment shall be counted only until that date and then it will remain fixed.
- 5.3.4.** In this case, **PUCP** reserves the right to apply penalties and sanctions set Forth in paragraph 1.11 of these Terms and conditions.
- 5.3.5.** Goods and services prices must include taxes, insurances, transportation costs, inspections, packaging costs, work costs, installation costs and adjustments (if applicable) required for the use, pursuant to the laws in force, as well as any other item that may have an incidence on purchased good cost.

5.4. Payment

- 5.4.1.** **PUCP** shall make an advance payment referred to in paragraph 1.10.1 of these Terms and Conditions within the term and under the conditions set forth therein, provided the bidder has signed an acceptance of purchase order and **PUCP** has received guarantees and insurances established in that purchase order.
- 5.4.2.** Advance payment and balance invoices must state the purpose of the purchase order and they shall be issued in accordance with applicable legal devices, unless the supplier is not domiciled in Peru, in which case an invoice shall meet the legal provisions of the country of origin. If these conditions are not met, the invoice shall be rejected.
- 5.4.3.** For payment of the purchase order balance, a compliance note for warehouse entry shall be enclosed with the invoice to be furnished by **PUCP** as stated in paragraph 5.1.6.
- 5.4.4.** If any discrepancy in the accounts submitted by the supplier and review thereof by **PUCP** exists, **PUCP** shall return the invoice to the **winning bidder**, informing him about the discrepancies found. Only when the supplier corrects the invoice, **PUCP** shall accept the submission thereof and it shall be subject to the formalities set forth in this paragraph.
- 5.4.5.** For addressing issues related to taxes, the supplier shall observe the legal, tax, customs and labor provisions in force in our country.

5.4.6. For local suppliers making an economic tender in dollars, as per paragraph 3.2.5., the payment may be made in US Dollars or its equivalent into the domestic currency at the exchange-sale rate published by the Banking and Insurance Superintendency on the date of check writing.

5.4.7. For suppliers domiciled outside, payment shall be made as per paragraph 1.10.2.

5.5. General Terms

5.5.1. The **winning bidder** shall deliver the goods under the conditions, characteristics, quantities and terms stated in the purchase order.

5.5.2. Force majeure events beyond your control (non-contractual acts of god and nature events) preventing the performance of obligations of the **winning bidder**, shall be communicated and duly accredited within a term of twenty-four (24) hours upon occurrence of the fact (unless for force majeure events preventing them). On the other side, **PUCP** shall be entitled not to release the **winning bidder** from penalties set forth in these Terms and Conditions. **PUCP** reserves the right to consider, based on the documentation submitted, whether this fact is a force majeure event or not.

5.5.3. Upon compliance with the date of delivery, and the additional term in which the application of penalties stated in paragraph 1.11 is 10% of the purchase order amount, **PUCP** shall be entitled to reverse the purchase order in any time, because the supplier fails to meet the delivery terms and because of not agreeing with the quality, quantity and characteristics of goods and/or services set forth in these Terms and Conditions, with no liability of any kind towards **PUCP** and notwithstanding the filing of the corresponding claims for damages caused for said failure.

5.5.4. If after two (2) business days as from the issue of purchase order, no written answer is received from the **winning bidder**, it shall be considered as knowledge, acceptance and compliance of every and each of the conditions set forth therein.

6. Guarantees

6.1. Advance Payment Guarantee



The **winning bidder** shall hand over **PUCP** an advance payment guarantee letter issued by a first-order entity (with A rating, according to risk rating companies), supervised by the Peruvian Banking and Insurance Superintendency or by a first-order bank abroad with a Peruvian correspondent bank, for the advance payment amount. This guarantee letter must be unconditional, joint and several, irrevocable, without any benefit of excussion and automatic realization at the request of **PUCP**.

No joint guarantees may be accepted, i.e. shared responsibility guarantees.

The bidder shall deliver this **guarantee letter** together with an invoice for tender advanced payment formalities.

This guarantee letter shall be valid up to forty (40) calendar days as from the date scheduled for delivery of equipment and signature of the corresponding final compliance certificate.

6.2. Performance Guarantee

Prior to the issue of the purchase order, the **winning bidder** shall hand over a guarantee letter in order to ensure **PUCP** the compliance with delivery of goods and provision of services subject matter of this international public bidding contained in the corresponding purchase order, at any scope, in an amount equal to ten per cent (10%) of the total purchase order amount.

This guarantee letter shall be valid up to forty (40) calendar days as from the date scheduled for delivery of equipment and signature of the corresponding final compliance certificate. It shall have the same characteristics of an advance payment guarantee letter.

6.3. Equipment Guarantee

The bidder shall include within the technical tender the scopes and terms for equipment guarantee subject matter of this international public bidding.

7. Reference Terms / Technical Specifications

7.1. Technical Specifications

Characteristics of goods and services to be procured through this international public bidding shall be specified in Appendix 1.

7.2. General Conditions

7.2.1. For each item or component to be tendered, the bidder must:

- State the name, general description of the good to be supplied, materials to be used, model type. Give necessary details in attached files.
- Include an explanation of conditions under which guarantees are offered for the product against manufacture and hidden defects, provision of spares and technical assistance during the estimated lifetime of goods, duly certified by the manufacturers.
- Hand over use and preventive maintenance manuals for each equipment.
- State all requirements for equipment installation and use, taking into account the voltage required for each equipment. Housing power voltage in Lima – Peru is 220V.

7.2.2. Besides, the following should be taken into account:

- Minimum guarantee term required for each item is stated in Appendix 1. However, the winning bidder must also ensure he may provide the technical assistance and spare service for a term of five (5) years at least, stating the conditions under which these services shall be provided upon expiry of the initial guarantee term.
- As a payment condition, a compliance certificate shall be processed with the **PUCP** specialized user.

ANEXO 1

(Especificaciones Técnicas)

Anexo 1

INTERNATIONAL PUBLIC BIDDING CPI 017-2014-PUCP

Procurement of Equipment for the Institute for Radio Astronomy

Technical Specifications

The following specifications contain:

1. Summary of the software and hardware to be purchased.
2. Images of similar equipment to the equipment to be purchased.
3. Detailed characteristics of the software and hardware to be purchased.
4. A relation of the symbols and abbreviations used in the description of the equipment.

Annotations:

- The awarding of the goods will be granted for each complete item, however, in items 1 and 7, which include several components, **PUCP** reserves the right to grant all components to a single bidder or grant the components to different bidders, for which tiered pricing will be required.
- Each bidder may present tenders for one or various items.
- If a tender is presented for one item, ALL components must be included.

a) Summary of the software and hardware to be purchased:

ITEM	COMPONENTE	DESCRIPCIÓN	CANT
1		Modular Equipment for Radio Astronomy	
	1.1	PXI Compatible Controller	1
	1.2	PXI Compatible Chassis	1
	1.3	PXI Compatible FPGA module focused on software based DSP	1
	1.4	PXI Compatible RF Receiver	1
	1.5	PXI Compatible RF Vector Signal Analyzer	1
	1.6	PXI Compatible Multi-function DAQ	1
	1.7	PXI Compatible Mass Storage RAID array	1
	1.8	RAID to PC connection module for PXI systems	1
	1.9	PXI Compatible High precision DAQ.	1
	1.10	High sensitivity accelerometer	3
	1.11	Impact Hammer	1
2		LabVIEW software	1
3		High Precision Cesium standard Atomic Clock	1
4		Workstation	1
5		LED Monitor	1
6		Floor-standing rack cabinets.	1
7		Devices for Radio Astronomy.	
	7.1	Low noise amplifier – Type 1.	1
	7.2	Downconverter.	1
	7.3	System for Radio Astronomy - Type 1.	1
	7.4	Low noise Band-pass filter	1
	7.5	Low noise amplifier – Type 2	1
	7.6	System for Radio Astronomy - Type 2.	1
8		Absolute Rotary Encoder	2

b) Images:

Item 1: Modular Equipment for Radio Astronomy

Component 1.1



PXI Compatible Controller

Component 1.2



PXI Compatible Chassis

Component 1.3



PXI Compatible FPGA module focused on software based DSP

Component 1.4



PXI Compatible RF Receiver (Adapter or Module)

Component 1.5



PXI Compatible RF Vector Signal Analyzer (Adapter or module)

Component 1.6



PXI Compatible Multi-function DAQ

Component 1.7



PXI Compatible Mass Storage RAID array

Component 1.8



RAID to PC connection module for PXI systems

Component 1.9



PXI Compatible High precision DAQ

Component 1.10



High sensitivity accelerometer: (Quantity: 3)

Component 1.11



Impact Hammer

Item 2: LabVIEW software (no image)

Item 3: High precision Cesium Standard Atomic Clock



Item 4: Workstation



Item 5: LED Monitor (Quantity: 4 - Four)



Item 6: Floor-standing rack cabinets



Item 7: Devices for Radio Astronomy

Component 7.1



Low noise amplifier – Type 1

Component 7.2



Downconverter

Component 7.3



System for radio astronomy – Type 1

Component 7.4



Low noise band-pass filter

Component 7.5



Low noise amplifier - Type 2

Component 7.6



System for Radio Astronomy – Type 2

Item 8: Absolute rotary Encoder



c) Detailed characteristics of the software and hardware to be purchased:

Item 1: Modular equipment for Radio Astronomy

Component 1.1 PXI Compatible Controller

N°	Technical Specifications
1	Description
1.1	High performance multi-function embedded controller for PXI systems, with Windows OS. LabVIEW compatible.
2	Specifications
2.1	Quad-core Intel Core i7-3610QE de 2.3GHz to 3.3GHz with Turbo Boost
2.2	12GB/s transfer speed for expansion modules. 2GB/s transfer speed per slot for expansion modules
2.3	Windows 7 and LabVIEW RT support
2.4	2 USB 3.0 ports
2.5	4 USB 2.0 ports
2.6	4GB RAM (máximo 16GB)
2.7	24/7 operation
2.8	Serial Ports
2.9	Parallel Ports
2.10	IEEE 488.2 Interface (GPIB)
2.11	Operating conditions:
2.11.1	Temperature Range: 0 – 55°C
2.11.2	Humidity Range: 10 – 90%, non-condensing
3	Manuals
3.1	User Manual and technical manual
4	Set-up and installation
4.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
5	Training
5.1	Training on Hardware: Local face-to-face advanced training with the device and with online access to knowledge base and learning sessions. Training on LabVIEW software: Must include LabVIEW Core 1, LabVIEW Core 2, Real-Time LabVIEW and LabVIEW FPGA. Duration: Determined by the provider. Number of participants: 5
6	Warranty
6.1	5 years: Must include assembly, calibration, preventive and corrective maintenance free of charge. Must include operating system back-up image.
7	Lead Time
7.1	30 days from the purchase date.
8	Power Requirements
8.1	+3.3V (5.4A max.), +5V (2.0A max), +12V (5.0A max), -12V, Auxiliary +5V (0.4A max). Supplied by a PXI chassis.
9	Maintenance Plan
9.1	During the warranty period: Every 1 or 2 years, at the discretion of PUCP . Must include preventive maintenance, set-up and calibration free of charge. PUCP will only assume the shipping cost. Can be local or international service. Outside the warranty period: Labor, parts and shipping assumed by PUCP .

Item 1: Módulo de Radioastronomía

Component 1.2 PXI Compatible Chassis



N°	Technical Specifications
1	Description
1.1	3U PXI compatible Chassis, with 18 expansion slots and a high bandwidth backplane. Must be able to house a PXI compatible controller. LabVIEW Compatible.
2	Specifications
2.1	1 main connection slot for an embedded controller
2.2	16 PXI Express hybrid slots. 1 timing slot
2.3	Up to 4GB/s transfer speed per slot
2.4	Compatibility with PXI, PXI Express, compactPCI, compactPCIe
2.5	Remote power control and voltage monitoring.
2.6	Total power: 925W
2.7	Operating conditions:
2.7.1	Temperature Range: 0 – 55°C
2.7.2	Humidity Range: 10 – 90%, non-condensing
3	Manuals
3.1	User Manual and technical manual
4	Set-up and installation
4.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
5	Training
5.1	Training on Hardware: Local face-to-face advanced training with the device and with online access to knowledge base and learning sessions. Training on LabVIEW software: Must include LabVIEW Core 1, LabVIEW Core 2, Real-Time LabVIEW and LabVIEW FPGA. Duration: Determined by the provider. Number of participants: 5
6	Warranty
6.1	5 years: Must include assembly, calibration, preventive and corrective maintenance free of charge. Must include operating system back-up image.
7	Lead Time
7.1	30 days from the purchase date.
8	Power requirements
8.1	Voltage Input: 100 a 240 VAC (range: 90 – 264 VAC) Input frequency: 50/60Hz (range: 47 – 63 Hz) Current: 6 – 12 A Over-current protection: 15A
9	Maintenance Plan
9.1	During the warranty period: Every 1 or 2 years, at the discretion of PUCP . Must include preventive maintenance, set-up and calibration free of charge. PUCP will only assume the shipping cost. Can be local or international service. Outside the warranty period: Labor, parts and shipping assumed by PUCP .

Item 1: Módulo de Radioastronomía

Component 1.3 PXI Compatible FPGA for software based DSP

N°	Technical Specifications
1	Description
1.1	High performance FPGA module, focused on software programmable DSP. PXI-Express compatible. Must allow the implementation of digital filters, custom processing, FFT logic, among others. LabVIEW Compatible.
2	Specifications
2.1	PXI interface from chassis and controller
2.2	FPGA Virtex-5 SX95T, DSP focused through the LabVIEW FPGA module
2.3	512 MB DDR2 DRAM
2.4	132 I/O lines, configurable as 66 differential pairs. (Maximum speed per line: 1Gbit/s)
2.5	16 DMA channels for high speed write (above 800 MB/s)
2.6	Connection Interface: x4 PXI Express, v1.0 or above
2.7	Operating conditions:
2.7.1	Temperature Range: 0 – 55°C
2.7.2	Humidity Range: 10 – 90%, non-condensing
3	Manuals
3.1	User Manual and technical manual
4	Set-up and installation
4.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
5	Training
5.1	Training on Hardware: Local face-to-face advanced training with the device and with online access to knowledge base and learning sessions. Training on LabVIEW software: Must include LabVIEW Core 1, LabVIEW Core 2, Real-Time LabVIEW and LabVIEW FPGA. Duration: Determined by the provider. Number of participants: 5
6	Warranty
6.1	5 years: Must include assembly, calibration, preventive and corrective maintenance free of charge. Must include operating system back-up image.
7	Lead Time
7.1	30 days from the purchase date.
8	Power requirements
8.1	Voltage input: 0 – 3.3 VDC Supplied by a chassis
9	Maintenance Plan
9.1	During the warranty period: Every 1 or 2 years, at the discretion of PUCP . Must include preventive maintenance, set-up and calibration free of charge. PUCP will only assume the shipping cost. Can be local or international service. Outside the warranty period: Labor, parts and shipping assumed by PUCP .

Item 1: Módulo de Radioastronomía

Component 1.4 PXI Compatible RF Receiver

N°	Technical Specifications
1	Description
1.1	High bandwidth RF receiver module, configurable through an FPGA module, with access to a PXI bus. LabVIEW Compatible.
2	Specifications
2.1	PXI-Express Connection Interface, from chassis and controller
2.2	RF range: 0.2 – 4.4 GHz, bandwidth of 200MHz
2.3	12 I/O bidirectional configurable channels
2.4	Local oscillator input and outputs, for MIMO systems
2.5	Connection to an FPGA for RF data DSP analysis
2.6	Amplitude accuracy:
2.6.1	200MHz to 1GHz: 0.55 dB
2.6.2	1 to 2GHz: 0.55 dB
2.6.3	2 to 3GHz: 0.65 dB
2.6.4	3 to 3.9GHz: 1.3 dB
2.6.5	3.9GHz to 4.4GHz: 1.6 dB
2.7	Noise floor:
2.7.1	200MHz to 1GHz: -165 dBm/Hz
2.7.2	1 to 2GHz: -165 dBm/Hz
2.7.3	2 to 3GHz: -164 dBm/Hz
2.7.4	3 to 3.9GHz: -160 dBm/Hz
2.7.5	3.9GHz to 4.4GHz: -151 dBm/Hz
2.8	Tuning resolution: Below 250kHz
2.9	Local oscillator frequency steps: 4MHz, 6MHz, 12MHz y 24MHz
2.10	Frequency settling time: Below a 50ms per 100Hz.
2.11	Operating conditions:
2.11.1	Temperature Range: 0 – 55°C
2.11.2	Humidity Range: 10 – 90%, non-condensing
3	Manuals
3.1	User Manual and technical manual
4	Set-up and installation
4.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
5	Training
5.1	Training on Hardware: Local face-to-face advanced training with the device and with online access to knowledge base and learning sessions. Training on LabVIEW software: Must include LabVIEW Core 1, LabVIEW Core 2, Real-Time LabVIEW and LabVIEW FPGA. Duration: Determined by the provider. Number of participants: 5
6	Warranty
6.1	5 years: Must include assembly, calibration, preventive and corrective maintenance free of charge. Must include operating system back-up image.
7	Lead Time
7.1	30 days from the purchase date.
8	Power requirements
8.1	Supplied by an FPGA module through a chassis.

9	Maintenance Plan
9.1	During the warranty period: Every 1 or 2 years, at the discretion of PUCP . Must include preventive maintenance, set-up and calibration free of charge. PUCP will only assume the shipping cost. Can be local or international service. Outside the warranty period: Labor, parts and shipping assumed by PUCP .

Item 1: Modular equipment for Radio Astronomy

Component 1.5 PXI Compatible RF Vector Signal Analyzer

N°	Technical Specifications
1	Description
1.1	RF vector signal analyzer, with local oscillators and digital downconverters. Able to perform as a spectrum analyzer and signal analyzer. LabVIEW compatible.
2	Specifications
2.1	PXI Express Connection interface, through a chassis and embedded controller
2.2	Frequency Range: 0.02 to 14 GHz, with 25/50MHz configurable bandwidth
2.3	I/O Connectors: SMA female
2.4	Input Channels: 1
2.5	Noise Floor: -165 dBm/Hz at 1GHz
2.6	Amplitude accuracy: ± 0.1 dB
2.7	RF signal recording and playback, real time spectrum analysis and modulation.
2.8	Peer-to-peer transmission to other FPGA modules
2.9	Low and high level software configurable control - LabVIEW
2.10	Operating conditions:
2.10.1	Temperature Range: 0 – 55°C
2.10.2	Humidity Range: 10 – 90%, non-condensing
3	Manuals
3.1	User Manual and technical manual.
4	Set-up and installation
4.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
5	Training
5.1	Training on Hardware: Local face-to-face advanced training with the device and with online access to knowledge base and learning sessions. Training on LabVIEW software: Must include LabVIEW Core 1, LabVIEW Core 2, Real-Time LabVIEW and LabVIEW FPGA. Duration: Determined by the provider. Number of participants: 5
6	Warranty
6.1	5 years: Must include assembly, calibration, preventive and corrective maintenance free of charge. Must include operating system back-up image.
7	Lead Time
7.1	30 days from the purchase date.
8	Power requirements
8.1	+3.3V (1.1A max), +12V (4.0A max) Supplied by a chassis.

9	Maintenance Plan
9.1	During the warranty period: Every 1 or 2 years, at the discretion of PUCP . Must include preventive maintenance, set-up and calibration free of charge. PUCP will only assume the shipping cost. Can be local or international service. Outside the warranty period: Labor, parts and shipping assumed by PUCP .

Item 1: Modular equipment for Radio Astronomy

Component 1.6 PXI Compatible Multi-function DAQ

N°	Technical Specifications
1	Description
1.1	Multi-function Data Acquisition module with multiple inputs and outputs and a high sampling rate, suitable for analog-digital control. LabVIEW compatible.
2	Specifications
2.1	PXI-Express Connection Interface, from chassis and controller.
2.2	FPGA Virtex-5 LX110, programmable through LabVIEW
2.3	8 analog inputs with independent sampling rates: up to 750 kHz, 16 bit resolution, $\pm 10V$.
2.4	8 analog outputs with independent sampling rates: up to 1MHz, 16 bit resolution, $\pm 10V$.
2.5	96 digital lines, configurable as inputs, outputs, timers or custom logic with up to 40MHz sampling rate.
2.6	3 DMA channels
2.7	Bandwidth: Small signals: 1MHz Large signals: 500kHz
2.8	Settling time:
2.8.1	Slew Rate: 20 voltios: 2.1us for $\pm 16LSB$
2.8.2	Slew Rate: 2 voltios: 1.3us for $\pm 16LSB$
2.8.3	Slew Rate: 0.2 voltios: 0.8us for $\pm 16LSB$
2.9	Ports input/output current: 4.0mA
2.10	Operating conditions:
2.10.1	Temperature Range: 0 – 55°C
2.10.2	Humidity Range: 10 – 90%, non-condensing
3	Accesories
3.1	Shield type-D to VHDCI cable, shielded I/O connector block
4	Manuals
4.1	User Manual and technical manual
5	Set-up and installation
5.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
6	Training
6.1	Training on Hardware: Local face-to-face advanced training with the device and with online access to knowledge base and learning sessions. Training on LabVIEW software: Must include LabVIEW Core 1, LabVIEW Core 2, Real-Time LabVIEW and LabVIEW FPGA. Duration: Determined by the provider. Number of participants: 5
7	Warranty
7.1	5 years: Must include assembly, calibration, preventive and corrective maintenance free of charge. Must include operating system back-up image.
8	Lead Time
8.1	30 days from the purchase date.

9	Power requirements
9.1	Variable. Supplied by a connection chassis.
10	Maintenance Plan
10.1	During the warranty period: Every 1 or 2 years, at the discretion of PUCP . Must include preventive maintenance, set-up and calibration free of charge. PUCP will only assume the shipping cost. Can be local or international service. Outside the warranty period: Labor, parts and shipping assumed by PUCP .

Item 1: Modular equipment for Radio Astronomy

Component 1.7 PXI Compatible Mass storage RAID Array

N°	Technical Specifications
1	Description
1.1	2U chassis for RAID arrays, with high speed connection to the PC. Includes Hard Drives. LabVIEW Compatible.
2	Specifications
2.1	Disk count: 24 disks of 1TB
2.2	Sustained read/write speeds: up to 3.6GB/s
2.3	RAID modes: 0, 1, 5, 6, 10
2.4	Control and monitoring of hard drives and RAID slots.
2.5	Disk Hot-swapping
2.6	'Endless record' Function, allowing the independent swapping of disks to continue recording without interruption.
2.7	MXI link to control the device from the PCE.
2.8	Operating conditions:
2.8.1	Temperature Range: 0 – 55°C
2.8.2	Humidity Range: 10 – 90%, non-condensing
3	Accessories
3.1	Power cord, PCI Express x8 v2.0 cable
4	Manuals
4.1	User Manual and technical manual
5	Set-up and installation
5.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
6	Training
6.1	Training on Hardware: Local face-to-face advanced training with the device and with online access to knowledge base and learning sessions. Training on LabVIEW software: Must include LabVIEW Core 1, LabVIEW Core 2, Real-Time LabVIEW and LabVIEW FPGA. Duration: Determined by the provider. Number of participants: 5
7	Warranty
7.1	5 years: Must include assembly, calibration, preventive and corrective maintenance free of charge. Must include operating system back-up image.
8	Lead Time
8.1	30 days from the purchase date.
9	Power requirements
9.1	240VAC, 60Hz.

10	Maintenance Plan
10.1	During the warranty period: Every 1 or 2 years, at the discretion of PUCP . Must include preventive maintenance, set-up and calibration free of charge. PUCP will only assume the shipping cost. Can be local or international service. Outside the warranty period: Labor, parts and shipping assumed by PUCP .

Item 1: Módulo de Radioastronomía

Component 1.8 RAID to PC connection module for PXI systems

N°	Technical Specifications
1	Description
1.1	High speed MXI link module to connect a RAID array to the PC. The array is transparently shown on the PC as a group of hard drives. LabVIEW Compatible.
2	Specifications
2.1	Direct control from the PC through PXI Express systems using a peripheral PCI Card.
2.2	5m cable length.
2.3	Sustained performance of 3.2GB/s
2.4	Transparent link for PXI Express
2.5	Connection of multiple arrays and PXI systems in separate chassis.
2.6	Peer-to-peer connection
2.7	Operating conditions:
2.7.1	Temperature Range: 0 – 55°C
2.7.2	Humidity Range: 10 – 90%, non-condensing
3	Accesorios
3.1	MXI adapter cable to connect the module to a compatible chassis.
4	Manuals
4.1	User Manual and technical manual
5	Set-up and installation
5.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
6	Training
6.1	Training on Hardware: Local face-to-face advanced training with the device and with online access to knowledge base and learning sessions. Training on LabVIEW software: Must include LabVIEW Core 1, LabVIEW Core 2, Real-Time LabVIEW and LabVIEW FPGA. Duration: Determined by the provider. Number of participants: 5
7	Warranty
7.1	5 years: Must include assembly, calibration, preventive and corrective maintenance free of charge. Must include operating system back-up image.
8	Lead Time
8.1	30 days from the purchase date.
9	Power requirements
9.1	Not applicable.

10	Maintenance Plan
10.1	During the warranty period: Every 1 or 2 years, at the discretion of PUCP . Must include preventive maintenance, set-up and calibration free of charge. PUCP will only assume the shipping cost. Can be local or international service. Outside the warranty period: Labor, parts and shipping assumed by PUCP .

Item 1: Módulo de Radioastronomía

Component 1.9 PXI Compatible High Precision DAQ

N°	Technical Specifications
1	Description
1.1	High precision Data acquisition module for PXI-Express systems. Specifically designed for sound and vibration applications. LabVIEW compatible.
2	Specifications
2.1	PXI-Express connection interface, through a chassis and embedded controller.
2.2	16 analog inputs simultaneously sampled at up to 204.8 kS/s
2.3	ADC resolution: 24 bits; dynamic range of 114 dB
2.4	4 gain settings up to ± 30 dB, for ranges from ± 316 mV to ± 10 V.
2.5	4mA software configurable IEPE and TEDS inputs for microphones and accelerometers.
2.6	Analog signal coupling: filter at 0.5Hz
2.7	Optimized operation for modal analysis and audio software suites of LabVIEW
2.8	Operating conditions:
2.8.1	Temperature Range: 0 – 55°C
2.8.2	Humidity Range: 10 – 90%, non-condensing
3	Accesorios
3.1	Shielded high performance connection cables, for up to 8 analog channels.
4	Manuals
4.1	User Manual and technical manual
5	Set-up and installation
5.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
6	Training
6.1	Training on Hardware: Local face-to-face advanced training with the device and with online access to knowledge base and learning sessions. Training on LabVIEW software: Must include LabVIEW Core 1, LabVIEW Core 2, Real-Time LabVIEW and LabVIEW FPGA. Duration: Determined by the provider. Number of participants: 5
7	Warranty
7.1	5 years: Must include assembly, calibration, preventive and corrective maintenance free of charge. Must include operating system back-up image.
8	Lead Time
8.1	30 days from the purchase date.
9	Power requirements
9.1	Variable. Supplied by a connection chassis.
10	Maintenance Plan
10.1	During the warranty period: Every 1 or 2 years, at the discretion of PUCP . Must include preventive maintenance, set-up and calibration free of charge. PUCP will only assume the shipping cost. Can be local or international service. Outside the warranty period: Labor, parts and shipping assumed by PUCP .

Item 1: Módulo de Radioastronomía

Component 1.10 High Sensitivity Accelerometer

Quantity: Three (03)

N°	Technical Specifications
1	Description
1.1	High sensitivity IEPE accelerometer compatible with high precision DAQs.
2	Specifications
2.1	Sensitivity ($\pm 10\%$): 100mV/g (10.2 mV/(m/s ²))
2.2	Measuring range: ± 50 g pk (± 490 m/s ² pk)
2.3	Resolution (from 1 to 10,000 Hz): 0.00015 g rms (0.0015 m/s ² rms)
2.4	Frequency Range ($\pm 5\%$): 0.5 to 10,000 Hz
2.5	Linearity: Approximately linear in the range of 100Hz to 6,000Hz
2.6	Weight: 0.2 ounces (5.8 grams)
2.7	Connector: SMC 10-32
2.8	Sensor type: IEPE
2.9	Requirement: Compatibility with high precision DAQ inputs for sound and vibration applications.
3	Manuals
3.1	User Manual and technical manual
4	Set-up and installation
4.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
5	Training
5.1	Training on Hardware: Local face-to-face advanced training with the device and with online access to knowledge base and learning sessions. Training on LabVIEW software: Must include LabVIEW Core 1, LabVIEW Core 2, Real-Time LabVIEW and LabVIEW FPGA. Duration: Determined by the provider. Number of participants: 5
6	Warranty
6.1	5 years: Must include assembly, calibration, preventive and corrective maintenance free of charge. Must include operating system back-up image.
7	Lead Time
7.1	30 days from the purchase date.
8	Maintenance Plan
8.1	During the warranty period: Every 1 or 2 years, at the discretion of PUCP . Must include preventive maintenance, set-up and calibration free of charge. PUCP will only assume the shipping cost. Can be local or international service. Outside the warranty period: Labor, parts and shipping assumed by PUCP .

Item 1: Modular Equipment for Radio Astronomy

Component 1.11 Impact Hammer

N°	Technical Specifications
1	Description
1.1	IEPE modally tuned impact hammer for vibration tests, compatible with high precision DAQs. Capable of registering impact force values.
2	Specifications
2.1	Sensitivity ($\pm 10\%$): 10mV/lb-f
2.2	Measuring range: Up to 500 lb-f
2.3	Diameter: 0.6 inches
2.4	Weight: 0.34 lb (0.16 kg.)
2.5	Requirement: Compatibility with high precision DAQ inputs for vibration and sound applications.
2.6	Type: IEPE
3	Accessories
3.1	Adapter cable to BNC connector
4	Manuals
4.1	User Manual and technical manual
5	Set-up and installation
5.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
6	Training
6.1	Training on Hardware: Local face-to-face advanced training with the device and with online access to knowledge base and learning sessions. Training on LabVIEW software: Must include LabVIEW Core 1, LabVIEW Core 2, Real-Time LabVIEW and LabVIEW FPGA. Duration: Determined by the provider. Number of participants: 5
7	Warranty
7.1	5 years: Must include assembly, calibration, preventive and corrective maintenance free of charge. Must include operating system back-up image.
8	Lead Time
8.1	30 days from the purchase date.
9	Maintenance Plan
9.1	During the warranty period: Every 1 or 2 years, at the discretion of PUCP . Must include preventive maintenance, set-up and calibration free of charge. PUCP will only assume the shipping cost. Can be local or international service. Outside the warranty period: Labor, parts and shipping assumed by PUCP .

Item 2: Software - LabVIEW

N°	Technical Specifications
1	Description
1.1	Multi-function software suitable for control, automation, spectral analysis and various applications that depend on the user's programming. Connection to and control of DAQ modules, embedded controllers, spectral analyzers, vector signal analyzers, among others. Multiple PC software license.
2	Specifications
2.1	Perpetual license
2.2	Includes all modules and tool blocks.
2.3	1 year software updates, extension subject to payment.
2.4	1 year specialized software support.
2.5	Installation in at least 15 computers.
3	Accessories
3.1	None
4	Manuals
4.1	Online manual and digital user manual.
5	Set-up and installation
5.1	User performs the installation.
6	Training
6.1	Training on Hardware: Local face-to-face advanced training with the device and with online access to knowledge base and learning sessions. Training on LabVIEW software: Must include LabVIEW Core 1, LabVIEW Core 2, Real-Time LabVIEW and LabVIEW FPGA. Duration: Determined by the provider. Number of participants: 5
7	Warranty
7.1	Perpetual license. 1 year warranty, support and updates. 1 year extension of support and updates.
8	Lead Time
8.1	30 days from the purchase date.

Item 3: High Precision Cesium Standard Atomic Clock

N°	Technical Specifications
1	Description
1.1	High precision Cesium Standard Atomic clock, required for applications that require precise synchronization and timing.
2	Specifications
2.1	3U Chassis
2.2	Accuracy: $\pm 1.0E-12$
2.3	Warm-up time: 30 minutes
2.4	Reproducibility: $\pm 2.0E-13$
2.5	Allan deviation:
2.5.1	Minimum: $5.0E-14$
2.5.2	100,000 seconds: $8.5E-14$
2.5.3	1,000 seconds: $8.5E-13$
2.5.4	10 seconds: $8.5E-12$
2.5.5	1 second: $1.2E-11$
2.6	3 1PPS outputs, above a 3.0V, 50 Ω output impedance
2.7	2 synchronization 1PPS inputs
2.8	Operating conditions:
2.8.1	Temperature Range: 0 – 50°C
2.8.2	Humidity Range: Hasta 95%, non-condensing
3	Warranty
3.1	1 year. Must include free-of-charge replacement on manufacturing defects and corrective maintenance. Local service should be available.
4	Battery/USB Computer/Power requirements
4.1	Internal battery duration: maximum of 45 minutes.
4.2	External DC power supply: 24VDC
5	Lead Time
5.1	Depends on configuration and manufacturer conditions.
6	Power requirements
6.1	AC: 100 to 240VAC, 47 to 63Hz. Maximum power: 80W DC (batteries): 36-75VDC- Maximum power: 70W
7	Maintenance Plan
7.1	Free of preventive maintenance or calibration for 10 years. 10 year lifespan extension through the replacement of the Cesium Tube.

Item 4: Workstation

N°	Technical Specifications
1	Description
1.1	High performance workstation, suitable for high speed processing and heavy multitasking.
2	Specifications
2.1	4 AMD Opteron 6366 HE Abu Dhabi processors, 16 cores at 1.8GHz (max: 3.1GHz), 16MB L2, Socket G34, (64 total cores)
2.2	Supermicro H8QGI-F-O SWTX Motherboard QP G34 Quad AMD 45nm 8-Core/16-Core Opteron 62/6300 Series CPU
2.3	32GB (16x2GB) DDR3 1333 (PC3 10600) SDRAM
2.4	1,600W ATX Power supply, 80 PLUS GOLD Certified
2.5	Dual 3GB 192-bits DDR3 Graphic cards. PCI Express 3.0 x16, parallel connection. HDMI, DVI and VGA outputs.
2.6	Storage:
2.6.1	Main Hard Drive: 512GB SSD, SATA III, 500MB/s read/write speed.
2.6.2	Secondary Hard Drive: Dual 2TB, 7,200RPM, 64MB de cache, 3.5". Sata 6.0Gb/s Hard Drives. RAID 1 configuration.
2.7	DVD optical drive
2.8	Wireless Card: Dual Band 2.4GHz/5GHz, 450Mbps Wireless adapter
2.9	Full Tower ATX Chassis
2.10	Windows Server 2008
3	Accesorios
3.1	Keyboard, mouse and speakers
4	Manuales
4.1	User manual(s).
5	Set-up and installation
5.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
6	Warranty
6.1	2 year warranty. Must include replacement and corrective maintenance free of charge. Must include international clients.
7	Lead Time
7.1	Depends on configuration and manufacturer conditions.
8	Power requirements
8.1	240VAC, 60Hz.

Item 5: LED MonitorQuantity: **Four (04)**

N°	Technical Specifications
1	Description
1.1	Full HD 32 inch LED Monitor.
2	Specifications
2.1	LED technology
2.2	Screen size: 32 inches
2.3	Resolution: 1,920x1,080
2.4	Response time: 3ms
2.5	DVI input
2.6	HDMI input
2.7	VGA input
2.8	VESA mount
2.9	Contrast: 10M:1
3	Manuals
3.1	User manual.
4	Set-up and installation
4.1	The device will be shipped with all necessary items for its proper installation, set-up and operation.
5	Warranty
5.1	1 year warranty
6	Lead time
6.1	Immediate, depending on the provider's stock.
7	Power requirements
7.1	240VAC, 60Hz.

Item 6: Floor-standing rack cabinets

N°	Technical Specifications
1	Description
1.1	32U floor-standing rack cabinets.
2	Specifications
2.1	32U height
2.2	19U width, with sliding rails and circular grommet holes.
2.3	Cold rolled steel structure
2.4	Electrostatic powder black paint
2.5	Thermal treatment with deoxidizing sealing process.
2.6	Oval shaped top access.
2.7	Main door with 4mm tempered glass.
2.8	Dismountable doors
2.9	Bottom ventilation hatch
2.10	Bottom wheels for transportation
3	Warranty
3.1	1 year warranty.

Item 7: Devices for Radio Astronomy

Component 7.1 Low noise amplifier – Type 1

N°	Technical Specifications
1	Description
1.1	High performance low noise amplifier, suitable for radio astronomy applications.
2	Specifications
2.1	Operating frequency: 1.42GHz
2.2	Noise level: 20K / Noise figure: 0.3 dB
2.3	Gain: 35dB
3	Warranty
3.1	1 year warranty
4	Battery/USB Computer/Power requirements
4.1	DC supply for operation.
5	Lead Time
5.1	30 days from the purchase date.

Item 7: Devices for Radio Astronomy

Component 7.2 Downconverter

N°	Technical Specifications
1	Description
1.1	Intermediate frequency downconverter. Suitable for radio astronomy applications.
2	Specifications
2.1	Base frequency: 1.42GHz
2.2	Intermediate frequency: 70MHz
2.3	Gain: 65dB
2.4	Noise level: < 70K / Noise figure < 1 dB
3	Warranty
3.1	1 year warranty
4	Battery/USB Computer/Power requirements
4.1	DC supply for operation.
5	Lead Time
5.1	30 days from the purchase date.

Item 7: Implementos para radioastronomía

Component 7.3 System for Radio Astronomy - Type 1

N°	Technical Specifications
1	Description
1.1	System composed of a low noise amplifier, downconverter and cooper feed. Suitable for radio astronomy applications.
2	Specifications
2.1	Downconverter's base frequency: 4GHz (to be determined)
2.2	Downconverter's intermediate frequency: 1,420MHz
2.3	Gain: 60dB
2.4	Main frequency of the feed and low noise amplifier: 4GHz
2.5	Noise level: Below 20K
2.6	Amplifier gain: 35dB
3	Warranty
3.1	1 year warranty
4	Battery/USB Computer/Power requirements
4.1	DC supply for operation.
5	Lead Time
5.1	30 days from the purchase date.

Item 7: Devices for Radio Astronomy

Component 7.4 Low Noise Band-pass filter

N°	Technical Specifications
1	Description
1.1	High performance, low noise band-pass filter. Suitable for radio astronomy applications.
2	Specifications
2.1	Frequency: 610MHz (to be determined)
2.2	Noise level: Below 20K
3	Warranty
3.1	1 year warranty
4	Battery/USB Computer/Power requirements
4.1	DC supply for operation.
5	Lead Time
5.1	30 days from the purchase date.

Item 7: Devices for Radio Astronomy

Component 7.5 Low noise amplifier – Type 2

N°	Technical Specifications
1	Description
1.1	High performance low noise amplifier, suitable for radio astronomy applications.
2	Specifications
2.1	Operating frequency: 610MHz (to be determined)
2.2	Noise level: 25K
2.3	Gain: 17dB
3	Warranty
3.1	1 year warranty
4	Battery/USB Computer/Power requirements
4.1	DC supply for operation.
5	Lead Time
5.1	30 days from the purchase date.

Item 7: Devices for Radio Astronomy

Component 7.6 System for Radio Astronomy – Type 2

N°	Technical Specifications
1	Description
1.1	System composed of a low noise amplifier, downconverter and cooper feed. Suitable for radio astronomy applications.
2	Specifications
2.1	Downconverter's base frequency: 6.6GHz (to be determined)
2.2	Downconverter's intermediate frequency: 70MHz
2.3	Gain: 45dB
2.4	Main frequency of the feed and low noise amplifier: 6.6GHz
2.5	Noise level: Below 3K
2.6	Amplifier gain: 35dB
3	Warranty
3.1	1 year warranty
4	Battery/USB Computer/Power requirements
4.1	DC supply for operation.
5	Lead Time
5.1	30 days from the purchase date.

Item 8: Absolute Rotary Encoder

N°	Technical Specifications
1	Description
1.1	High precision absolute rotary encoder.
2	Specifications
2.1	Absolute resolution: 20 bits (0.6 arcseconds)
2.2	Output signal: Serial communications protocol
2.3	Initial torque: 2.0E-4 N.m
2.4	Main housing: Stainless steel
2.5	Top cover: Aluminum
2.6	Dimensions:
2.6.1	Shaft diameter: 6mm.
2.6.2	Sensor diameter: 57mm.
2.6.3	Sensor width: 24mm.
2.7	Operating conditions:
2.7.1	Temperature Range: -40 – 85 °C
3	Warranty
3.1	1 year warranty
4	Battery/USB Computer /Power requirements
4.1	DC supply for operation. +5V (0.2A maximum), o +15V (0.04A maximum)
5	Lead Time
5.1	30 days from the purchase date.

Where applicable (DAQs, measuring devices, etc.) calibration certificates must be included.

Symbol	Description
°C	Degrees Celcius
Ω	Ohms
A	Amperes
B	Byte: Information unit equivalent to 8 bits.
dB	Decibel
dBm	Decibel relative to 1mW
G	Giga: 1.0E+9
g	Gram Unit representing the acceleration produced by Earth's gravity
Hz	Hertz
K	Kelvin
k	Kilo: 1.0E+3
lb	Pounds
lb-f	Pound force
M	Mega: 1.0E+6
m	Meters Mili: 1.0E-3
mm	Milimeter
N.m	Newton-meter
n	Nano: 1.0E-9
s	Seconds
T	Tera: 1.0E+12
u	Micro: 1.0E-6
V	Volts
VAC	Volts Alternating Current
VDC	Volts Direct Current
W	Watts

Abbreviations	Description
24/7	24 hours a day, 7 days a week.
ADC	Analog to Digital Converter: Conversion system from analog signals to digital signals
ATX	Advanced Technology Extended: Form and size factor for computational systems
Bit	Minimum binary unit
DAQ	Data Acquisition Systems
DC	Direct Current
DDR2	Double Data Rate type 2: RAM interface.
DDR3	Double Data Rate type 3: RAM interface.
DMA	Direct Memory Access
DRAM	Dynamic RAM: RAM memory type.
DSP	Digital Signal Processing
DVI	Digital Video Interface.
Fast Fourier Transform - FFT	Signal processing algorithm
FPGA	Field Programmable Gate Array
Full HD	Full High Definition: Resolution standard of 1920x1080 pixels.
HDMI	High Definition Media Interface
IEPE	Integrated Electronics Piezo Electric: Construction standard for measuring devices through piezoelectric materials.
LED	Light Emitting Diode
LSB	Least Significant Bit
Montaje VESA	Mechanical mount standard for video devices
MXI	Link between a PXI device and a computer through a card installed in the PCI expansion slot of the computer.
PC	Personal Computer.
PCI-Express	Upgrade to the PCI communications bus for computer peripherals.
Peer-to-peer	Direct connection between two users, devices and computers without intermediary.
Pixel	Smallest part of a digital image.
PPS	Pulse per second
PXI	PCI Extensions for Instrumentation: Industrial communications bus for instrumentation and control systems
RAID	Redundant Array of Independent Disks
RF	Radio Frequency
RMS	Root Mean Square: Statistical measurement of a varying quantity.
RPM	Revolutions per minute
S	Samples

Abreviatura	Descripción
SATA	Serial Advanced Technology Attachment: data interface between a motherboard and storage devices
SDRAM	Synchronous Dynamic RAM
SSD	Solid State Drive
TEDS	Transducer Electronic Data sheets: Information of sensors and transducers, related to the ID, data and calibration stored in the internal memory of the sensor.
U	Rack Unit: Standard measure unit for racks that considers a length of 19 inches width by 1.75 inches tall.
VGA	Analog video connection

ANNEX 2

(Forms)

**CPI 017-2014-PUCP INTERNATIONAL PUBLIC BIDDING
FORM No. 01**

BUSINESS INFORMATION SWORN STATEMENT

The undersigned, _____, legal agent of _____, identified by (National ID Card, Alien's Registration Card or any document valid in the country of origin) No. _____, with power of attorney registered in the town of _____, under Filing Card No. _____, Entry No. _____, **does hereby declare under oath** that the following information about the company I represent is true:

General Information

Name or corporate name:			
Business name:		Company Tax ID ⁽¹⁾	
Address:			
Telephone:	Telephone:	Fax:	
Email:	City:	Department:	Country:
Contact Person:			

Note 1: Use a RUC number for companies domiciled in Peru and an identification valid in the country of origin for companies domiciled outside Peru.

Creditor's Banking Information

Order	Bank name	Currency	Account number	Interbank account number (CCI) ⁽²⁾	Savings	Checking	Account holder ⁽³⁾
1							
2							
3							

Note 2: For invoice payment via bank transfer

Note 3: The abovementioned account shall belong to the company's corporate name

Quality Information

Does your company have a Quality System? (Explain)	Progress level:
--	-----------------

Legal Agent Particulars:

Name: _____
National ID Card in the country of origin or Alien's Registration Card: _____

Signature of the Legal Agent

City, year, month and day

CPI 017-2014-PUCP INTERNATIONAL PUBLIC BIDDING

FORM No. 02

SWORN STATEMENT

City, year, month and day

Pontificia Universidad Católica del Perú

We hereby address to you in order to state as follows:

- We are aware of, accept and subject ourselves to the Terms and Conditions, conditions and procedures of this international public bidding to which we are parties, since we have studied the documents pertaining to the bidding terms and conditions. Thus, we fully agree with the contents of those documents and adhere to the conditions thereof.

Therefore, we acknowledge we will have no right to file any claim for saying we are unaware thereof during the awarding process and, subsequently, during the execution process if awarded with the contract.

- We accept that the construction of the Terms and Conditions and other documents to be issued by **PUCP** are **PUCP**'s responsibility.
- We are responsible for the veracity of documents and information submitted to you for the Selection Process.
- We undertake to keep the tender during the whole term for the awarding process and to accept the purchase order to be issued by **PUCP** if awarded with the contract.
- We are not impeached or disqualified for contracting with **PUCP** as stated in paragraph 1.7 of the Terms and Conditions.
- We hereby certify to be aware of the contents of the Code of Ethics and Good Governance of **PUCP** (published at www.pucp.edu.pe) and undertake to denounce acts of corruption and fraud we become aware of and accept civil and criminal consequences if being involved therein.
- We are legally empowered to submit the tender and enter into the corresponding agreement, if selected.

Sincerely,

Signature and seal of the bidder's legal agent
Legal agent's name
Corporate name



**CPI 017-2014-PUCP INTERNATIONAL PUBLIC BIDDING
FORM No. 03A (For items 2, 3, 4, 5, 6 and 8)**

FORM OF ECONOMIC TENDER

(Fill in a form **for each item** in which you are involved as a bidder)

City, year, month and day

Pontificia Universidad Católica del Perú

Upon reviewing the International Public Bidding Terms and Conditions, including the acquittal of inquiries, we hereby make the following tender:

Item xxx² _____ item description _____

OPTION A. Callao³ CIF Price in dollars
Equipment Price in dollars

Unit Price
X Quantity
= Total Price USD _____

Local services (if applicable) in Soles (including IGV) _____ soles

Total amount: _____ USD plus _____ soles

OPTION B. Local Price in Soles
Equipment Sale Price
Service Sale Price _____ soles
Subtotal
IGV (18%) _____ soles
Total price

If our tender is accepted, we engage in delivering the goods within the tender term equal to _____ calendar days.

The tender shall be valid during all the selection process.

We hereby accept the mean of payment established in the Terms and Conditions and state we will make use (will not make use) of 40% in advance set forth therein.

This Tender shall be a mandatory performance agreement until the corresponding purchase order is prepared and accepted.

Sincerely,

Signature and seal of the bidder's legal agent
Legal agent's name
Corporate name

² State the item numbering kept on the technical specifications and to which this tender refers.

³ El Callao Port or Jorge Chavez International Airport, as decided by the bidder.



**CPI 017-2014-PUCP INTERNATIONAL PUBLIC BIDDING
FORM No. 03B (For items 1 and 7)**

FORM OF ECONOMIC TENDER

City, year, month and day

Pontificia Universidad Católica del Perú

Upon reviewing the International Public Bidding Terms and Conditions, including the acquittal of inquiries, we hereby make the following tender:

OPTION A. Callao⁴ CIF Price in dollars

Item	Component	Description	Unit Price	Quantity	Partial Value
1		Radio Astronomy Station		1	
	1.1	Driver compatible with PXI Express.		1	
	1.2	Case for a driver compatible with PXI Express.		1	
	1.3	FPGA station for DSP through software.		1	
	1.4	Radiofrequencies Receptor compatible with PXI-Express.		1	
	1.5	Radiofrequencies Vector Analyzer.		1	
	1.6	DAQ Multi-function.		1	
	1.7	RAID Array of high capacity.		1	
	1.8	Connection module of RAID array to PC		1	
	1.9	High precision DAQ		1	
	1.10	High sensitivity accelerometer		3	
	1.11	Impact hammer		1	
Total item 1				USD	

If you aren't able to provide any component of this item fill with a 0 (zero) in the fields Unit Price and Quantity.

Discount % if PUCP buys all components of item 1 from us _____

If our bid is accepted, we compromise to deliver the item 1 components in the agreed deadline, of _____ calendar days.

Item	Component	Description	Unit Price	Quantity	Partial Value
7		Radio Astronomy Implements		1	
	7.1	Low Noise Preamplifier type 1.		1	
	7.2	Frequency converter		1	
	7.3	Radio Astronomy System type 1.		1	
	7.4	Low Noise Bandpass Filter		1	
	7.5	Low Noise Preamplifier type 2		1	
	7.6	Radio Astronomy System type 2		1	
Total item 7				USD	

If you aren't able to provide any component of this item fill with a 0 (zero) in the fields Unit Price and Quantity.

⁴El Callao Port or Jorge Chavez International Airport, as decided by the bidder.



Discount % if PUCP buys all components of item 7 from us _____

If our bid is accepted, we compromise to deliver the item 7 components in the agreed deadline, of _____ calendar days.

ALTERNATIVA B. Local price in **soles**, including IGV.

Item	Component	Description	Unit Price	Quantity	Partial Value
1		Radio Astronomy Station		1	
	1.1	Driver compatible with PXI Express.		1	
	1.2	Case for a driver compatible with PXI Express.		1	
	1.3	FPGA station for DSP through software.		1	
	1.4	Radiofrequencies Receptor compatible with PXI-Express.		1	
	1.5	Radiofrequencies Vector Analyzer.		1	
	1.6	DAQ Multi-function.		1	
	1.7	RAID Array of high capacity.		1	
	1.8	Connection module of RAID array to PC		1	
	1.9	High precision DAQ		1	
	1.10	High sensitivity accelerometer		3	
	1.11	Impact hammer		1	
Total item 1			Soles (including IGV)		

If you aren't able to provide any component of this item fill with a 0 (zero) in the fields Unit Price and Quantity.

Discount % if PUCP buys all components of item 1 from us _____

If our bid is accepted, we compromise to deliver the item 1 components in the agreed deadline, of _____ calendar days.

Item	Component	Description	Unit Price	Quantity	Partial Value
7		Radio Astronomy Implements		1	
	7.1	Low Noise Preamplifier type 1.		1	
	7.2	Frequency converter		1	
	7.3	Radio Astronomy System type 1.		1	
	7.4	Low Noise Bandpass Filter		1	
	7.5	Low Noise Preamplifier type 2		1	
	7.6	Radio Astronomy System type 2		1	
Total item 7			Soles (including IGV)		

If you aren't able to provide any component of this item fill with a 0 (zero) in the fields Unit Price and Quantity.

Discount % if PUCP buys all components of item 7 from us _____

If our bid is accepted, we compromise to deliver the item 7 components in the agreed deadline, of _____ calendar days.

Notes: Each component can have prices in alternative A, B or both.

The offer will be valid during all the selection process.

We accept the payment means established in the terms and conditions and we declare if we will take or not take the 40% payment in advance specified there.

This offer will result in a contract with mandatory fulfillment until the purchase order is prepared and accepted.

Sincerely,

Signature and seal of the bidder's legal agent
Legal agent's name
Corporate name

CPI 017-2014-PUCP INTERNATIONAL PUBLIC BIDDING

FORM No. 04

COMMITMENT TO PERFORM THE DELIVERY OF GOODS WITHIN THE PROPOSED TERM

City, year, month and day

Pontificia Universidad Católica del Perú

We hereby address to you in order to undertake to perform the delivery of goods subject matter of the above-captioned International Public Bidding as per the term specified in our technical tender, as from the date set forth in the purchase order, i.e. _____ calendar days.

Sincerely,

Signature and seal of the bidder's legal agent
Legal agent's name
Corporate name