



बसु बिज्ञान मन्दिर

BOSE INSTITUTE

P-1/12, C.I.T. Scheme VII-M, Kolkata 700 054

BIDDING DOCUMENTS

For Tender Notice No.

BI-K/E-TEND/03/2019-20

To be addressed to:

**The Registrar (Officiating),
Bose Institute, Centenary Building,
P-1/12, CIT Scheme - VII -M
Kolkata - 700054 (INDIA)**



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INVITATION TO BIDS

Director, Bose Institute, Kolkata, West Bengal, India invites **online** offers from **foreign/Indian manufacturers** or their Authorized Dealers for "Production, test and support of PCIe40 cards for the ALICE experiment":

Sl. No.	Name of the items	Qty.	Bid security (EMD)
1.	PCIe40 Cards	266	INR 20,10,000.00

- **Details of specifications are enclosed in Annexure - I**
- **Please quote unit price of the cards in the additional folder including the price break up for 266 cards in the said folder.**

Sl. No.	Particulars	Date & Time
1.	Date of uploading of NIT & other documents (Online) (Publishing date)	04.06.2019
2.	Documents download start date (Online)	04.06.2019
3.	Clarification Start date Queries to be sent to the mail id bipurchase@jcbose.ac.in)	04.06.2019 at 17:30 hrs.
4.	Clarification End date	09.6.2019 upto 13:00 hrs.
5.	Prebid Conference	11.6.2019 at 12:00 hrs.
6.	Amendment (if any) (On line)	13.6.2019 at 17:00 hrs.
7.	Bid submission start date (On line)	14.6.2019 at 17:00 hrs.
8.	Documents download end date (Online)	25.6.2019 upto 17:00 hrs.
9.	Bid Submission closing (On line)	25.6.2019 upto 17:00 hrs.
10.	Last Date of submission of Earnest Money Deposit Including the technical brochure, if any (Off line)	26.6.2019 upto 17:00 hrs.
11.	Bid opening date for Technical Proposals (Online)	27.6.2019 at 13:00 hrs.
12.	Date of uploading list for Technically Qualified Bidder (online)	To be notified later
13.	Date of uploading the final list of Technically Qualified Bidder (online) after disposal of appeals, if any.	To be notified later
14.	Date for opening of Financial Proposal (Online)	To be notified later



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SECTION - A

INSTRUCTION TO BIDDERS

- A. General guidance for e-Tendering :** Instructions / Guidelines for electronic submission of the tenders have been annexed for assisting the vendors to participate in e-Tendering.
1. **Registration of Vendors :** Any vendor willing to take part in the process of e-Tendering will have to enrol and get registered in the Central Public Procurement (CPP) Portal, NIC, GOI through logging on to <http://eprocure.gov.in/eprocure/app> and the vendor is to click on the link for e-Tendering site as given on the above.
 2. **Digital Signature certificate (DSC) :** Each vendor is required to obtain a Class-II or Class-III Digital Signature Certificate (DSC) for submission of tenders as applicable from the approved service provider of the National Informatics Centre (NIC) on payment of requisite amount. Details are available at the Web Site stated in Clause A.1. above DSC is given as a USB e-Token.
 3. The foreign bidders can directly submit their bid through the e-procurement by obtaining their DSC applicable from NIC, India.
 4. The vendor can search & download N.I.T. & Tender Document(s) electronically from computer once they log on to the website mentioned in Clause A.1. using the Digital Signature Certificate. This is the only mode of collection of Tender Documents.
 5. **Submission of Tenders:** Tenders are to be submitted through online as stated in Clause A.1. in two folders at a time for each bid, one in Technical Proposal & the other is Financial Proposal before the prescribed date & time using the Digital Signature Certificate (DSC). The documents are to be uploaded should be virus scanned copy duly Digitally Signed. The documents will get encrypted (transformed into non readable formats).
5. A. **Technical Proposal:** The Technical proposal should contain scanned copies of the following in two covers (folders).
- (a) **Statutory Cover** containing the following documents :
 - (i) **NIT (Download the NIT & upload the same using digital signature)**
 - (ii) **Registration Certificate for enrolment with the Central Purchase Organization / other Govt. Dept. for quoting on behalf of the foreign principals, as per latest notification of Procurement Policy Division, Department of Expenditure, Ministry of Finance.**
 - (iii) Bidders' Information Form
 - (iv) Bid Form
 - (v) Techno-Commercial Bid Form
 - (vi) Manufacturer's Authorization Form
 - (vii) Bidder's Performance Statement Form
 - (viii) Service Support Details Form
 - (ix) Technical Compliance Statement Form
 - (x) **Fall Clause Certificate**
 - (xi) **The bidder should have at least 10 technically qualified persons in its payroll having experience in execution of similar kind of job. The details of the personnel are to be uploaded in the technical cover.**



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- (b) **Non-statutory Cover** containing the following documents :
For indigenous quotes the bidder has to upload requisite registration / tax certificate like TAN, PAN, Trade License, CIN, GST, Factory License, Income Tax Return of the last three financial years [2015-16, 16-17, 17-18 and (18-19 if available)], up-to-date GST clearance, Certificate of Registration with EPF and ESI with updated Challan etc.

Note : *Failure to submit any of the above mentioned documents (listed under 5(a) & (b) may render the bid liable to be summarily rejected for both statutory and non-statutory cover. However, the Institute reserves the right to obtain short fall documents of the tender, if required as per proper procedure.*

5.B. **Financial Proposal :**

- The financial bid should contain the Bill of Quantities (BOQ) corresponding to this tender, which is available on the tender webpage as an MS-Excel file.
 - This file must be downloaded and opened with MS-Excel. The rate being quoted by the bidder must be entered in the space marked for this purpose in the file. **Quoted rate** will be encrypted under BOQ. **In case quoting any rate in Tender Form, the tender is liable to be summarily rejected.**
 - All fields in the BOQ file other than those allocated for the name of the bidder and the rate(s) being quoted are non-editable.
 - The BOQ file must be saved after this and should be uploaded using digital signature.
 - OPTIONAL ITEMS/Additional Warranty Charge beyond Standard warranty period and training charges (if any) must be separately quoted and uploaded as PDF file.
- In the BOQ quoted in foreign currency (click to select currency) fill up the applicable column (i.e. 'Ex-works', 'Discount (if any)', 'Freight', 'Insurance', 'other taxes (if applicable)', 'Installation & commissioning charges (if applicable)' and ignore the other column.**
 - In the BOQ quoted in INR (click to select currency) fill up the applicable column (i.e. 'Basic Rate', 'Discount (if any)', 'GST', 'Other taxes (if applicable)', 'Installation & Commissioning charges (if applicable)' and ignore the other.**
 - Bidders are requested not to put any percentage (%) in any column of the BOQ.**
 - As per Govt. Notification # 45/2017 dt. 14th November, 2017 (Central tax rate) and 47/2017 dated 14.11.2017 (Integrated tax rate), Scientific Research Institute funded by the Govt. of India, GST will be applicable @5% for the goods used for research purpose, for the bids where GST will be applicable, against DSIR Certificates to be provided by the Institute.**

6. **Earnest Money Deposit:**

- Demand Draft / Bankers Cheque / Bank Guarantee towards Earnest Money (EMD) as prescribed in the N.I.T. should be in favour of "Bose Institute, Kolkata" payable at Kolkata.
- Demand Draft / Bankers Cheque / Bank Guarantee towards Earnest Money (EMD) as prescribed in the N.I.T. against each of the instruments in favour of "Bose Institute, Kolkata" payable at Kolkata (original hard copy) **alongwith a covering letter stating the bank details for releasing the said EMD online by the Institute, as per norms** to be submitted to the Purchase Section (Import) at the Centenary Building, P-1/12, CIT Scheme VII-M, Kolkata 700054.
- Bidder must upload copy of valid registration certificate for EMD exemption as per Govt. rule.



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**THE ABOVE STATED STATUTORY / NON-STATUTORY DOCUMENTS
SHOULD BE ARRANGED IN THE FOLLOWING MANNER**

Click the check boxes beside the necessary documents in the My Document list and then click the tab " Submit Non Statutory Documents' to send the selected documents to Non-Statutory folder.

Next Click the tab "Click to Encrypt and upload" and then click the "Technical" Folder to upload the Technical Documents.

N.B.: Failure of submission of any of the above mentioned documents as stated in Sl. No. A.5.(a). and Sl. No. A.5.(b). And 6 (a) & (b) will render the tenderer liable to be rejected for both statutory & non statutory cover. However, the Institute reserves the right to obtain short fall documents of the tender, if required as per proper procedure.



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General Instructions

1. Tender Evaluation Committee (TEC) : Evaluation Committee constituted as per Order of the competent authority of Bose Institute, Kolkata.
2. Opening & evaluation of tender: If any vendor is exempted from payment of EMD, copy of relevant Government Order needs to be furnished and uploaded in the portal as PDF file.
3. Opening of Technical Proposal: Technical proposals will be opened either by the Assistant Registrar / Accounts Officer, Bose Institute, Kolkata or their authorized representatives electronically from the website using their Digital Signature Certificates (DSC).
4. Intending tenderers may remain present if they so desire.
5. Cover (folder) for Statutory Documents (Ref. Sl. No. A.5.(a).) will be opened first and if found in order, cover (folder) for Non-Statutory Documents (Ref. Sl. No. A.5.(b).) will be opened. If there is any deficiency in the Statutory Documents the bid will summarily be rejected.

However, the Institute reserves the right to obtain short fall documents of the tender, if required as per proper procedure.

6. Decrypted (transformed into readable formats) documents of the non-statutory cover will be downloaded & handed over to the Tender Evaluation Committee.
7. Pursuant to scrutiny & decision of the Tender Evaluation Committee, the summary list of eligible tenderers will be uploaded in the web portals.
8. During evaluation the committee may summon of the tenderers & seek clarification / information or additional documents or original hard copy of any of the documents already submitted & if these are not produced within the stipulated time frame, their proposals will be liable for rejection.
9. **Financial Proposal :**
 - a). The vendor is to quote the rate online in the space marked for quoting rate in the BOQ. For optional items as mentioned in the specifications may be quoted separately in the additional sheet as enclosed in the Financial Cover.
 - b). Only downloaded copies of the above documents are to be uploaded virus scanned & Digitally Signed by the vendor.
 - c). Penalty for suppression / distortion of facts:

If any tenderer fails to produce the original hard copies of the documents on demand of the Tender Evaluation Committee within a specified time frame or if any deviation is detected in the hard copies from the uploaded soft copies, it may be treated as submission of false documents by the tenderer and action may be referred to the appropriate authority for prosecution as per relevant IT Act.
 - (d). Rejection of Bid:

Director, Bose Institute reserves the right to accept or reject any Bid and to cancel the Bidding processes and reject all Bids at any time prior to the award of Contract without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the ground for Institute's action.
 - (e). **Award of Contract :**

The Bidder whose Bid has been accepted finally (both technical and financial), will be informed by the Institute authority for award of contract.
The notification of award will constitute the formation of the Contract.



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<ul style="list-style-type: none">• The bids would be opened in the presence of the bidders who wish to attend the Bid-opening. However, the representative should bring with them a letter of authority from the corresponding bidders, without which, they are not permitted to attend the bid opening.
<ul style="list-style-type: none">• The acceptance of the quotation will rest with the competent authority of Bose Institute, Kolkata who does not bind himself to accept the lowest quotation and reserves the right to himself to reject, or accept any or all the quotations.
<ul style="list-style-type: none">• The offer shall be valid for one hundred and twenty (120) days from the date of opening of the quotations. No revision in price will be allowed after opening of the quotation.
<ul style="list-style-type: none">• Unsolicited / conditional / in complete / digitally unsigned tenders shall not be considered.
<ul style="list-style-type: none">• <u>Offers that have been blindly copied from the tender specifications are not acceptable and shall be rejected.</u>
<ul style="list-style-type: none">• The Bidder / Company should not be in the list of black listed firms by any Govt. Dept. / PSU/other Govt. agencies.
<ul style="list-style-type: none">• The price comparison will be decided as per BoQ comparative chart on the date of opening of financial bid.
<ul style="list-style-type: none">• Prices are required to be quoted in units. When quotations are given in terms of other units, relationship between two sets of units should be furnished. Quantity discounts, if any should also be indicated. The items should be quoted indicating the serial nos.
<ul style="list-style-type: none">• To assess in the examination / evaluation, comparison and post qualification of the bids, purchaser may at its discretion, ask the bidder for a clarification of its bid. The request for clarification and the response shall be in writing and no change in the prices or substance of the bids shall be sought, offered or permitted. Any clarification submitted by the bidder in respect of its bid which is not in response to a request by the purchaser shall not be considered.
<ul style="list-style-type: none">• Either the Indian Agent on behalf of the Foreign principal or the Foreign principal can bid directly in a tender but not both. However, the offer of the Indian Agent should also accompany the authorisation letter from their principal. To maintain sanctity of tendering system, one Indian Agent can not represent two different Foreign principals in one tender.
<ul style="list-style-type: none">• Please indicate the agents in India, their address, the details of service rendered by them & the percentage of commission payable to them. In any case, agency commission is not allowed.
<ul style="list-style-type: none">• Two or more vendors cannot submit bid quoting the rates on behalf of same OEM.
<ul style="list-style-type: none">• The Institute is registered with Department of Scientific & Industrial Research, Govt. of India and thus is exempted from Customs duty vide notification no. 51/96 dated 23.07.1996 and GST exemption as per Govt. of India notification no. 45/2017 and 47/2017 dated 14.11.2017. The present details of registration are no. 11/106/1988-TU-V dt. 23.4.2018 valid upto 31.03.2021.
<ul style="list-style-type: none">• The mode of dispatch of the items to CERN must be mentioned clearly in the financial cover in the additional folder.
<ul style="list-style-type: none">• Samples, if called for, shall be submitted free of charge and on no obligation basis.
<ul style="list-style-type: none">• The delivery period as per tender documents shall have to be strictly adhered to in case an order is placed.



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PRE- QUALIFICATION CRITERIA OF THE BIDDER

1. The bidders should have work experience as following, supporting documents like copy of purchase order, installation certificate should be uploaded in this regard.
 - (i) Three similar completed works of Rs. 4 crore each in the last five years ending with the date of submission; or
 - (ii) Two similar completed works of Rs. 6 crore each in the last five years; or
 - (iii) One similar completed work of value Rs. 8 crore and above in the last 5 years.
2. **Financial Turn over**- should have an average annual turnover of Rs. 25 crore or above for engineering and manufacturing services (EMS) for last three years.
3. **Bank Solvency**- Considering the volume of work, the bidder should have to submit bank solvency certificate of minimum Rs. 25 crore issued by their banker not older than 3 months from the last date of the submission of tender.
4. The bidder should upload a declaration on a non judicial stamp paper of appropriate value that they have not defaulted in any occasions in the last three years in executing purchase order of similar nature for supply of similar items.
5. The bidder must submit a declaration on their letter head that they have not been blacklisted by any govt. department/PSU/autonomous bodies/Statutory body etc.
6. The bidder should be a profit making firm and should have made profit during last three financial years immediately preceding the deadline for submission of bids.
7. **Time will be an essence of this contract.** An undertaking has to be submitted by the bidder stating that they will abide all the tender terms and conditions of the tender and they will strictly follow the delivery schedule as per tender document

- **The technical bids of only the pre- qualified bidders will be evaluated.**

PRE CONTRACT INTEGRITY PACT

General

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on _____ day of the month of _____ 2019, between, on one hand, the Registrar, Bose Institute acting through Shri....., Designation of the officer, Bose Institute (hereinafter called the "BUYER", which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and M/s_____ represented by Shri_____, Chief Executive Officer (hereinafter called the "BIDDER/Seller" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure (Name of the Stores/Equipment/Item) and the BIDDER/Seller is willing to offer/has offered the stores and WHEREAS the BIDDER is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a Ministry/Department of the Government of India/PSU/Autonomous body performing its functions on behalf of the President of India

NOW, THEREFORE, to avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

Commitments of the BUYER

1.1 The BUYER undertakes that no official of the BUYER, connected directly or indirectly with contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or their party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.

1.1.1 The BUYER will, during pre-contract stage, treat all BIDDERS alike, and will provide to all BIDDERS the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS.

1.1.2 All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2. In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by

the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

Commitments of BIDDERS

3. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:-
 - 3.1 The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.
 - 3.2 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or forbearing to show favour or disfavour to any person in relation to the contract or any other contract with the Government.
 - 3.3 BIDDERS shall disclose the name and address of agents and representatives and Indian BIDDERS shall disclose their foreign principals or associates.
 - 3.4 BIDDERS shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.
 - 3.5 The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/integrator/authorized government sponsored export entity of the defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.
 - 3.6 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.
 - 3.7 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

- 3.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.
- 3.9 The BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.
- 3.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.
- 3.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.
- 3.12 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filing of tender.
The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.
- 3.13 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

4. Previous Transgression

- 4.1 The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Section Enterprise in India or any Government Department in India that could justify BIDDER's exclusion from the tender process.
- 4.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Earnest Money (Security Deposit)

- 5.1 While submitting commercial bid, the BIDDER shall deposit an amount of Rs. 20,10,000.00 as Earnest Money/Security Deposit, with the BUYER through any of the following instruments:
- (i) Bank Draft or a Pay Order in favour of Bose Institute, Kolkata.
 - (ii) A confirmed guarantee by an Indian Nationalised Bank, promising payment of the guaranteed sum to the BUYER on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.
 - (iii) Any other mode or through any other instrument such as NEFT/RTGS.
- 5.3 In case of the successful BIDDER a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase Contract that the provisions of Sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

5.4 No interest shall be payable by the BUYER to the BIDDER on Earnest Money /Security Deposit for the period of its currency.

6. Sanctions for Violations

6.1 Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:-

- (i) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.
- (ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.
- (iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.
- (iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.
- (v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.
- (vi) To cancel all or any other Contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.
- (vii) To debar the BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the BUYER.
- (viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.
- (ix) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.
- (x) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

6.2 The BUYER will be entitled to take all or any of the actions mentioned at Para 6.1(i) to (x) of this Pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal Code, 1860 or Prevention of Corruption Act, 1988, or any other statute enacted for prevention of corruption.

6.3 The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the independent Monitor(s) appointed for the purposes of this Pact.

7. Fall Clause

7.1 The BIDDER undertakes that it has not supplied/is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the BIDDER to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the BUYER, if the contract has already been concluded.

8. Independent Monitors

8.1 The BUYER will appoint independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission.

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

8.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

8.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The Monitor will submit a written report to the designated Authority or BUYER/Secretary in the Department/within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / BIDDER and should the occasion arise, submit proposals for correcting problematic situations.

9. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10. Law and Place of Jurisdiction

This Pact is subject to Indian Law. All disputes arising out of this Contract will be subjected to Kolkata jurisdiction.

11. Other Legal Actions

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

12. Validity

12.1 The validity of this Integrity Pact shall be from date of its signing and extend up to 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2 Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this Integrity Pact at _____ on _____

BUYER

BIDDER

Name of the Officer:

CHIEF EXECUTIVE OFFICER

Designation

BOSE INSTITUTE

Witness

Witness

1. _____

1. _____

2. _____

2. _____

*Provisions of these clauses would need to be amended / deleted in line with the policy of the BUYER in regard to involvement of Indian agents of foreign suppliers.



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SECTION B

TERMS & CONDITIONS

1. Price :

- Bidders are requested to give their final and best competitive offer. Techno-Commercial Discussions will be held with the Lowest Bidder only, if necessary. It will be the sole responsibility of the bidder to justify their quoted rates and any clarification in this regard asked by the Institute has to be promptly responded by the bidder with sufficient documentary evidence.
- Vendors, who do not accept our standard commercial terms are liable to be ignored. **A categorical confirmation of acceptance of all our terms and conditions in toto will have to be observed which enable speedy processing of the offers.**
- Pre-conditioned, incomplete offers, not in line with the terms and conditions of the tender documents, are liable to be rejected.

a. For Foreign Quotation :

- The price of the goods, quoted on FOB/FCA port of shipment should include Export Packing, Loading Charges, Inland Freight, carriage etc. in the shipper country to be paid by the Supplier.
- The price for transportation / carriage and insurance and other costs incidental to delivery of the goods upto the port of dispatch (CIF/CIP). In case any foreign bidder gets selected the items are to be delivered at the Institute for testing , installation and commissioning in presence of vendor's representative. In such case, the Institute will bear the responsibility of sending the tested items to CERN.
- Prices quoted by the bidder shall remain fixed during the entire period of contract and shall not be subject to variation on any account. A bid submitted with an adjustable price quotation will be treated as non - responsive and rejected.
- Prices charged by the Supplier for Goods delivered and Services performed under the Contract shall not vary from the prices quoted by the Supplier in its bid. Conditional offers indicating changes to price quoted due to price increase / decrease by the principal firm, market fluctuations, foreign exchange fluctuations etc. shall make the bid liable to be cancelled.

b. For Indigenous Quotation :

- The price of the goods, quoted (ex-works / ex-factory / ex-showroom / ex-warehouse, or off-the-shelf, as applicable), including all duties and other taxes payable.
- The amount payable on account of GST should be mentioned clearly. **If there is no explicit mention of taxes in your offer then quoted price will be deemed inclusive of such taxes. No other charges except those mentioned clearly in the bid will be paid.**



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For indigenous quotes in INR, the items manufactured at the vendors premises will be tested at the manufactures site in presence of Institute representatives to verify various performance parameters as per Institute requirement. All the expenses towards visit for witnessing performance test at vendors manufacturing site upto four representatives from Bose Institute side will be on the part of vendor. The representatives of Bose institute shall be full access to all tests. The vendor shall inform Bose Institute well in advance the schedule of testing to be conducted in presence of Institute representatives. After satisfactory testing at the vendors end in presence of Institute representatives, the same have to be shipped to CERN. In such case, the selected vendor has to bear the entire responsibility of shipping the items to CERN for their acceptance, with proper insurance against all risk factors to be arranged and ensured by the vendor. An estimated cost towards such shipment has to be categorically mentioned by the bidder in the financial cover as additional folder. The insurance shall be against all losses or damages from whatever causes it may be.

2. **Period of validity of Bids :**

- Bids shall remain valid at least for 120 days after the date of bid opening prescribed by the Purchaser.
- In exceptional circumstances, the Purchaser may solicit the Bidder's consent to an extension of the period of validity.

3. **Bid Currencies:** Prices shall be quoted in Indian Rupees or in freely convertible foreign currency wherever possible for comparison.

4. **Purchaser's Right to vary Quantities at the Time of Award:** The Purchaser reserves the right at the time of Contract award to increase or decrease the quantity of goods and services originally specified in the Schedule of Requirements without any change in unit price or other terms and conditions. However, the Purchaser reserves the right to call the lowest firm for negotiation in case of increase in quantity.

5. **Order acceptance:** The successful bidder should submit acceptance of the Purchase Order immediately but not later than 07 days in any case from the date of issue of the Purchase Order failing which it shall be presumed that the vendor is not interested and his bid security is liable to be forfeited. The successful bidder is required to enter into an agreement with Bose Institute on non-judicial stamp paper of appropriate value within 15 days from the date of issue of purchase order towards timely execution of the purchase order. Non-judicial stamp paper will be arranged by the contractor and cost thereof will be on the part of contractor.

6. **Patent Rights:** The Supplier shall indemnify the Purchaser against all third-party claims of infringement of patent, trademark or industrial design rights arising from use of the Goods or any part thereof in India.

7. The bidder shall not be permitted to participate in the aforesaid tender if any of it's relative is directly or indirectly associated with Bose Institute.



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8. Change Orders :

- The Purchaser may at any time, by written notice given to the Supplier make changes within the general scope of the Contract in any one or more of the following:
 - Drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Purchaser;
 - The method of shipping or packing;
 - The place of delivery; and/or
 - The Services to be provided by the Supplier.
 - The delivery schedule
 - If any such change causes an increase or decrease in the cost of, or the time required for, the Supplier's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or delivery schedule, or both, and the Contract shall accordingly be amended. Any claims by the Supplier for adjustment under this clause must be asserted within fifteen (15) days from the date of the Supplier's receipt of the Purchaser's change order.

9. Penalty for Late delivery.

- If the Supplier fails to deliver any or all of the Goods or to perform the Services within the period(s) specified in the Contract, the Purchaser shall, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as penalty, a sum equivalent to the percentage of the delivered price of the delayed Goods or unperformed Services for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the Percentage. Once the maximum is reached, the Purchaser may consider termination of the Contract.
- The applicable rate is 1% per week and the maximum deduction is 10% of the total contract price.
- If the vendor at any time fails to execute the work or part thereof and does not take effective steps to remedy it within seven days even after a notice in writing by the Institute, the institute will be entitled to forfeit the performance security deposit.

- 10. Applicable Law and arbitration:** All disputes arising out of this contract shall be referred to the sole arbitration of a person selected by the contractor out of the panel of three persons nominated by the Director, Bose Institute, and his decision /award shall be final and binding on both parties. The Arbitration shall be governed under the Indian Arbitration Act 1996 or any statutory modifications or re-enactment thereof and rules made there under and for the time being in force shall apply to the arbitration proceeding under this contract.

The Contract shall be interpreted in accordance with the laws of the Union of India and all disputes shall be subject to place of jurisdiction at Kolkata.

- 11. Right to Use Defective Goods :** If after delivery, acceptance and installation and within the guarantee and warranty period, the operation or use of the goods proves to be unsatisfactory, the Purchaser shall have the right to continue to operate or use such goods until rectifications of defects, errors or omissions by repair or by partial or complete replacement is made without interfering with the Purchaser's operation.

12. Payment :

a. For Foreign Payment :

In case of imports, payments are usually made through Letter of Credit (LC) / wire transfer / FDD wherever applicable. The LC will be opened for 100% value but the payment shall be released partly after acceptance of the items at CERN as per delivery schedule .90% payment of the invoice value as per batches will be released upon acceptance at CERN and the remaining 10 % of the invoice value of each batch will be released upon complete execution of all the 266 nos of cards with submission of 10% of the total order value as performance bank guarantee. TDS will be deducted as per rule.

b. For Indigenous Payment :

- The general conditions of payment for any indigenous items are 100% payment of the invoice value after successful testing, installation & commissioning of the items in batches as per delivery schedule and final acceptance of the supplied items at CERN, with submission of 10% of the total order value as PBG. TDS will be deducted as per rule.
- ***Criteria for release of payment for both foreign as well as indigenous supply ::***

In addition to the payment clauses as mentioned in 13 (a) and (b) the bidders must note that the following specific criteria will be followed by the buyer before release of any payment.

Invoices should be sent with the delivery of each batch as described in section 2.1 in the Annexure-I and payment will be released upon acceptance of each of the delivery batch at the delivery site at CERN based on the test results and acceptance by CERN according to the criteria as mentioned later in section 2.7.4 of Annexure-I or 4 weeks from receipt of consignment at the delivery site, whichever is earlier.

13. Delivery :

- **Delivery of the consignment(s) should be made in accordance with the delivery schedule mentioned in point 2.1. of the Annexure-I.** Within 24 hours of shipment, the supplier shall notify the purchaser and the insurance company by cable/telex/fax/e mail the full details of the shipment including contract number, railway receipt number/ AWB etc and date, description of goods, quantity, name of the consignee, invoice etc. The supplier shall mail the following documents to the purchaser with a copy to the insurance company :
 - 4 Copies of the Supplier invoice showing contract number, goods' description, quantity, unit price, total amount;
 - Acknowledgment of receipt of goods from the consignee(s) by the transporter;
 - Insurance Certificate if applicable;
 - Manufacturer's/Supplier's warranty certificate;
 - Inspection Certificate issued by the nominated inspection agency, if any, and the Supplier's factory inspection report;
 - Certificate of Origin; and
 - Two copies of the packing list identifying the contents of each package.
- The above documents should be received by the Purchaser before arrival of the consignment(s) (except where the Goods have been delivered directly to the Consignee with all documents) and, if not received, the Supplier will be responsible for any consequent expenses.



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14. **Bank Charges : For Foreign Procurement** : The bank charges inside India to the applicant account and outside India to the beneficiary account.
15. **Installation** : Installation should be Free of Cost
16. **Warranty** :
 - The Supplier shall warrants that the Goods supplied under this Contract are new, unused, of the most recent or current models and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier shall further warrants that all Goods supplied under this Contract shall have no defect arising from design, materials or workmanship (except when the design and/or material is required by the Purchaser's Specifications) or from any act or omission of the Supplier, that may develop under normal use of the supplied Goods in the conditions prevailing in the country of final destination. The warranty should be comprehensive and on site.
 - Warranty period in all relevant areas would be 12 months from the date of Acceptance & installation (as per Annexure-I)
 - The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall immediately, within a reasonable period, arrange to repair or replace the defective goods or parts thereof free of cost at the ultimate destination. The Supplier shall take over the replaced parts/goods at the time of their replacement. No claim whatsoever shall lie on the Purchaser for the replaced parts/goods thereafter. In case any component has to be imported the same shall be done on DDU Kolkata basis and the purchaser shall provide the customs duty exemption certificate. If the supplier having been notified fails to remedy the defects within a reasonable period, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expenses and without prejudice to any other rights, which the purchaser may have against the supplier under the contract.
 - Warranty period shall be 12 months from date of acceptance of Goods. The Supplier shall, in addition, comply with the performance and/or consumption guarantees specified under the contract. If for reasons attributable to the Supplier, these guarantees are not attained in whole or in part, the Supplier shall at its discretion make such changes, modifications, and/or additions to the Goods or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own cost and expense and to carry out further performance tests. **The warranty should be comprehensive on site.**
 - If a different period of warranty has been specified in the 'Technical Specifications' shall stand modified to that extent.
 - The necessary warranty certificate in this effect should be furnished along with the consignment.



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17. **Training :** The Supplier is required to train the designated Purchaser's technical and end user personnel to enable them to effectively operate the total equipment.
18. **Supporting Equipment:** If equipment will require indigenous supporting instruments/accessories (computer, printer, online UPS etc.) at the time of the installation, the same should be quoted in separate quotation.
19. **Service Facility :** Supplier should mention about the possible service set up in India and how capable they are to provide after sales service.
20. **Subletting of the work:**
Under normal circumstances no subletting of work is allowed.
21. **Force Majeure :**
 - The Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that, its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.
 - If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

Director, Bose Institute reserves the right to accept or reject any or all tenders either in part or in full. The reasons for rejecting the tender of a prospective bidder will be disclosed only when enquiries are made.



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Bidder Information Form

[The Bidder shall fill in this Form in accordance with the instructions indicated below. No alterations to its format shall be permitted and no substitutions shall be accepted. This should be done of the letter head of the firm]

Date: [insert date of Bid Submission] Tender No.: [insert number for Invitation for bids]

1. Bidder's Legal Name [insert Bidder's legal name]
2. Bidder's actual or intended Country of Registration: [insert actual or intended Country of Registration]
3. Bidder's Year of Registration: [insert Bidder's year of registration]
4. Bidder's Legal Address in Country of Registration: [insert Bidder's legal address in country of registration]
5. Bidder's Authorized Representative Information
Name: [insert Authorized Representative's name]
Address: [insert Authorized Representative's Address]
Telephone/Fax numbers: [insert Authorized Representative's telephone/fax numbers]
Email Address: [insert Authorized Representative's email address]
7. Attached are copies of original documents of: [check the box(es) of the attached original documents]

Signature of the Bidder
Name
Business Address



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BID FORM

(to be submitted on the official letterhead of the bidder)

**The Director,
Bose Institute,
P-1/12, CIT Scheme-VII/M,
Kolkata - 700054 (W.B.) India**

Sir,

Having examined the bidding documents the receipt of which is hereby duly acknowledged, I/We agree to furnish required supplies/services in conformity with the Techno-Commercial Bid or such portions thereof at the prices given in the Price Bid on receipt of order for the same.

I/We agree to hold this offer open until _____ and to supply, install and commission the equipment and complete the whole of the work and hand over to the purchaser within the period of _____ weeks, from the date of receipt of intimation from you regarding acceptance of this tender/receipt of supply order.

I/We agree to submit the bank guarantee as specified in the form prescribed by your goodself for the due performance of the contract, if our bid is accepted.

I/We understand that you are not bound to accept the lowest or any bid you may receive.

(_____)
Signature of Bidder
With Office Stamp
Name & Address

Telephone No.:

FAX No.:

E-mail address:

Name & Designation of the Contact Person:



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TECHNO-COMMERCIAL BID FORM

1.	Tender reference No	:	
2.	Due date of bid submission	:	
3.	Main Item Model No.	:	
4.	Life Expectancy of the Equipment (in years)	:	
5.	Warranty Period (in years)	:	
6.	Delivery Period of the Equipment	:	
7.	Details of Bank Guarantee enclosed as Bid Security :	:	
	Name of the Bank	:	
	Branch	:	
	Address with Phone, FAX & E-mail Nos.	:	
	Amount Rs.	:	
	Valid Upto	:	
8.	Country of the Origin of the Equipment	:	
9.	Bid currency	:	

Contd.....



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10.	Schedule of Requirements :	:	
I.	Whether agreeing to all the terms and conditions including payment terms as mentioned in the bidding documents		
II.	Port of Shipment		
III.	Approximate Shipment Weight (chargeable weight) in Kg. of the packed consignment		
IV.	Approximate Dimensions/ Volume of the packed consignment		
Note ::			
1.	Adhering to the format given above is a pre-requisite for considering your bid.		
2.	All columns must be filled up.		
3.	Separate list should be attached where required in the same format giving details of each item.		
4.	Please indicate applicability.		
I/we certify that I/We have completely read and understood and agree to all the terms & conditions given in ITB.			

(
Signature of Bidder
With Office Stamp
Name & Address
)



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MANUFACTURERS' AUTHORIZATION FORM

No. _____

Dated _____

**The Director,
Bose Institute,
P-1/12, CIT Scheme-VII/M,
Kolkata - 700054 (W.B.) India**

Dear Sir:

I/We _____ who are established and reputable manufacturers of _____ having factories at ----- (address of factory) do hereby authorize M/s. _____ (Name and address of Agent) to submit a bid, negotiate and receive the order from you against your tender enquiry.

No company or firm or individual other than M/s. _____ is authorized to bid, and conclude the contract in regard to this business.

I/We hereby extend our full guarantee and warranty as per Clause 15 of the General Conditions of Contract and Clause of the Special Conditions of Contract for the goods and services offered by the above firm.

Yours faithfully,

(Name)

(Name of manufacturers)

Note: This letter of authority should be on the **letterhead of the manufacturer** and should be signed by a person competent and having the power of attorney to bind the manufacturer. It should be included by the Bidder in its techno-commercial unpriced bid.



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BIDDER'S PERFORMANCE STATEMENT FORM
(For a Period of Last 3 Years)

Name of the Firm.....

Order placed by (full address with Tel. No., Fax No. & e-mail address of purchaser)	Date	Description and quantity of ordered equipment	Date of completion of delivery as per Contract/ Actual	Remarks indicating reasons for late delivery, if any	Has the equipment been installed satisfactory? (Attach a certificate from the purchaser/ Consignee)

Place :

Signature :

Date :

Office stamp



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SERVICE SUPPORT DETAILS FORM

Sl. No.	Nature of training imparted	List of similar type equipments serviced in the past 3 years	Address, Telephone Nos., Fax and e mail address of the firm located in Kolkata, if any	Value of minimum stock of consumable spares held at all times.

Signature and Seal of the manufacturer/Bidder.....

Place :

Date :



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TECHNCAL COMPLIANCE STATEMENT FORM

Specification as per the technical document (Annexure-I)	Parameters for compliance
<p>1.4: All units shall be delivered with a basic warranty of 1 (ONE) year starting from the date of acceptance by the indenter. During this period, the contractor shall maintain at its premises a test bench and tools that allow for the diagnosis of faults, shall purchase and replace the defective components and shall use the test bench to verify the units after the execution of the repair.</p> <p>The repair turnaround time shall be at most 3 weeks starting from the reception of the broken unit by the contractor to the reception of the repaired unit by the indenter.</p>	<p>Warranty period offered for the mentioned clause.</p>
<p>1.5: Extended warranty (Optional) The supplier is expected to quote for an extension of the basic warranty (as mentioned in 1.4) for an additional one year (i.e., two years in total) and an additional eight years beyond the two years period ,year wise. The indenter would order the extension of the basic warranty at least six months before the expiry of the basic warranty.</p>	<p>Warranty period offered for the mentioned clause.</p>
<p>3.5.1: Applicable international standards</p> <ol style="list-style-type: none">1. IPC Standard IPC-A-610 (Class 2)2. IPC Standard IPC/EIA J-STD-001 (Class 2);3. Cleanliness Designator C-22 (both sides of assembly to be cleaned; test for ionic residues required).	<p>Certification document number with validity date needs to be mentioned.</p>
<p>3.6: Manufacturing and tooling</p> <ol style="list-style-type: none">a) MSL controlled storage of the components and the PCB;b) Baking of the components (as per the data sheets) and the PCB (minimum 12h@110°C);c) SAC 305 (Tin 97%/Silver3%/ Copper 0.5%) solder paste coalescence test;d) SPI (Solder Paste Inspection) in 3D is mandatory in order to guarantee good solder paste depositione) Pick and place and test solder a PCB for a soldering thermal profile investigation shall be made with tooling (solderStar, Datapack,)f) Full AOI (Automated Optical Inspection) control, X-ray inspection, and flying probe test shall be made after thermal stressing of the assembled boards (main board and mezzanine, specific life cycle tests see 2.7).	<p>Mention availability and technical details for each of the items.</p>



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<p>3.8: Quality assurance and Documentation</p> <ul style="list-style-type: none">a) PCB and component entrance inspectionb) 3D SPIc) Full AOId) X-ray inspectione) Marking of each card with a QR code containing the manufacturer's identifier and the date of manufacturing (year and week);f) The staff involved in quality control shall be IPC certified and follow IPC class 3 standards for the following:<ul style="list-style-type: none">i. the mezzanine and motherboard assembly;ii. the repair of units.	<ul style="list-style-type: none">a) Mention technical details of the tools (make/model etc.)b) Mention technical details of the tools (make/model etc.)c) Mention technical details of the tools (make/model etc.)d) Mention technical details of the tools (make/model etc.)e) Mention technical details of the tools (make/model etc.)f) Mention number of staff with the required certification
<p>4.1: Type of firm</p> <ul style="list-style-type: none">a) In order to qualify for the bid, the respondent should be a private limited company/public limited company/proprietorship firm <i>etc.</i> except joint venture, whose competence and experience cover all the specified technical domains for this project and meeting all the requirements belowb) Financial Solvency: The firm must have an annual turnover of rupees 25 Crore for Engineering and manufacturing services (EMS) for last 3 years.	<ul style="list-style-type: none">a) Mention what type of firm. Supply documentary evidence.b) Mention turn over for last 3 years. Supply documentary evidence.
<p>4.2: Administrative situation</p> <p>The firm shall</p> <ul style="list-style-type: none">a) not be involved in bankruptcy proceedings, prosecution for debt, sequestration or any analogous situation arising from a similar procedure provided for in law;b) not have made arrangements of any kind with creditors for their benefit;c) not have been subject of a judgment for fraud, corruption or any other illegal activity.	<p>Provide an undertaking in regard of items mentioned.</p>
<p>4.3: Competence and experience</p> <ul style="list-style-type: none">a) The firm shall have in-house facility and proven experience in the field of manufacture of assembly of highly complex PCBs with FPGAs with more than 1000 ball grid array (BGA) connections of 0.5 mm pitch, QFN and QSP packages with a 0.4 mm pitch, and passive components of size 0201, in a highly automated CAM controlled industrial process. Manual placement of components by assembly drawings is strictly forbidden even at lower quantities. (Assembly drawings can be used only in cross-checking and verification).b) The firm should have expertise in testing PCBs with	<ul style="list-style-type: none">a) Mention technical details of the facility.b) and c) : provide documents as mentioned here.

<p>FPGAs with at least 1000 ball grid connections of the size 0.5 mm and smaller as well as high speed (10 Gb/s) optical link components or similar.</p> <p>c) The firm shall provide at least two references/purchase order of projects that are similar in scope, complexity and volume since 2013. The Indenter reserves the right to verify the references provided.</p>	
<p>4.4: Size of the Firm</p> <p>a) The firm must have at least 10 technical employees in the field of component assembly of boards and quality testing of such mounted PCBs.</p> <p>b) Capability of testing shall cover optical inspections, 3D X-ray imaging, as well as the competence of electrical measurements and functional testing of complex, high speed (~10 Gb/s) digital circuits.</p>	<p>a) Mention number of employees b) Mention technical details of the tools to be used</p>
<p>4.5: Technical Specification</p> <p>The firm shall demonstrate the ability of working according to industrial standards like IPC standard for class 3 PCB assembly</p>	<p>Provide credential.</p>

1. Credentials supporting claims in each case must be uploaded in the technical cover.
2. Any technical brochure that cannot be uploaded due to large size may be sent as hard copy on or before the last date for technical bid.

Please note:

1. Bids must have supporting documents (technical literature or copies of relevant pages from the service manual or factory test data) for all the points noted above, failure regarding which may result in rejection of bid.
2. In case the bidder furnishes wrong or false information wilfully in the technical compliance chart, such action shall be viewed strictly and the bidders may be blacklisted.

Signature and Seal of the manufacturer/Bidder.....

Place :

Date :



बसु बिज्ञान मन्दिर

BOSE INSTITUTE

P-1/12, C.I.T. Scheme VII-M, Kolkata 700 054, West Bengal, India

Ref : BI-K/E-TEND/03/2019-20

BID SECURITY FORM

(To be executed by a scheduled Bank in India on non-judicial stamp paper)

To
The Director,
Bose Institute,
P-1/12, CIT Scheme-VII/M,
Kolkata - 700054 (W.B.) India

Dear Sir,

Whereas (Name and address of Bidder) (hereinafter called "the Bidder") in response to your Tender Notification No. ----- dated ----- is submitting its bid for the supply of (Name and/or description of the goods) (Hereinafter called "the Bid").

KNOW ALL PEOPLE by these presents that WE (Name of bank) of (Name of country), having our registered office at (Address of bank) (Hereinafter called "the Bank"), are bound unto **Director, Bose Institute, Kolkata, INDIA** (Hereinafter called "the Purchaser") for the sum of (Amount of the Guarantee in Words and Figures) for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents. Sealed with the Common Seal of the said Bank this ____ day of _____ 20 ____.

THE CONDITIONS of this obligation are:

1. If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form; or
2. If the Bidder, having been notified of the acceptance of its bid by the Purchaser during the period of bid validity:

contd.....



बसु विज्ञान मन्दिर

BOSE INSTITUTE

P-1/12, C.I.T. Scheme VII-M, Kolkata 700 054, West Bengal, India

Ref : BI-K/E-TEND/03/2019-20

3. Fails or refuses to execute the Contract Form if required; or
4. Fails or refuses to furnish the performance security, in accordance with the Instruction to Bidders.
5. This guarantee is valid up to(six months from date).

We undertake to pay the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it, owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including forty-five (45) days after the period of the bid validity, and any demand in respect thereof should reach the Bank not later than the above date.

Date:

Signature.....

Place:

Seal of Bankers

(Complete Address/Contact Details with Tel./Fax/email etc)

Witness: 1.

2.



बसु बिज्ञान मन्दिर
BOSE INSTITUTE

P-1/12, C.I.T. Scheme VII-M, Kolkata 700 054, West Bengal, India

Ref : BI-K/E-TEND/03/2019-20

PERFORMANCE SECURITY FORM

(To be executed by a scheduled Bank in India on non-judicial stamp paper)

To
The Director,
Bose Institute,
P-1/12, CIT Scheme-VII/M,
Kolkata - 700054 (W.B.) India

Dear Sir,

Sub: Your Contract No. -----dated -----for

1. You have entered into a contract with reference no as given above with _____ (herein after referred to as the contractor) for the supply, installation, and commissioning of _____ (herein after referred to as stores) for the price and on the terms and conditions contained in the said contract.
2. In accordance with the terms of said contract, the contractor has undertaken to produce a bank guarantee for Rs. _____ (Rupees _____ only) being 10 % of the total value of the said stores supplied to you, for the due fulfilment of its obligations to you for due performance as per the contract during warranty period.
3. In consideration thereof, we hereby expressly, irrevocably and unconditionally undertake and guarantee as principal obligator on behalf of the contractor that in the event you submit a written demand to us that the contractor has not performed according to the contractual obligations included in the said contract, we will pay you on written demand, without demur and without reference to the contractor any sum up to a maximum amount of Rs _____ (Rupees _____ only).Your demand shall be conclusive evidence to us that such payment is due under the terms of the said contract. Payment by us to you will be made within thirty (30) days from receipt of your request making reference to this guarantee and on demand.
4. This guarantee shall not be revoked without your express consent and shall not be affected by your granting any indulgence to the contractor, which shall include but not be limited to postponement from time to time of the exercise of any powers vested in you or any right which you may have against the contractor and to exercise the same in any manner at any time and either to forbear or to enforce any covenant contained or implied in the said contract or any other course or remedy or security available to you, and our Bank shall not be released from its obligations under this guarantee by your exercising any of your rights with reference to matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on your part or any other indulgence shown by you or by any other matter or thing whatsoever which under law would, but for this provision, have the effect of relieving our Bank from its obligation under this guarantee.



बसु बिज्ञान मन्दिर

BOSE INSTITUTE

P-1/12, C.I.T. Scheme VII-M, Kolkata 700 054, West Bengal, India

Ref : BI-K/E-TEND/03/2019-20

5. Notwithstanding anything herein contained, our liability under this guarantee is restricted to Rs _____ (Rupees _____ only) and the guarantee shall remain in force up to and including the _____ day of being reported to us by you and returned to us duly discharged.
6. Unless a demand or claim under this guarantee is made on us in writing on or before the aforesaid expiry date as provided above or unless this guarantee is extended by us all your rights under this guarantee shall be proscribed and we shall be discharged from the liabilities hereunder.
7. This guarantee shall not be affected by any change in the constitution of our Bank or of the contractor or for any other reason whatsoever.

Date:

Signature.....

Place:

Seal of Bankers

(Complete Address/Contact Details with Tel./Fax/email etc)

Witness:

1.

2.



बसु बिज्ञान मन्दिर

BOSE INSTITUTE

P-1/12, C.I.T. Scheme VII-M, Kolkata 700 054, West Bengal, India

Ref : BI-K/E-TEND/03/2019-20

Annexure-I

**Technical Specification
Production, test and support of PCIe40 cards for the
ALICE experiment at CERN**

Abstract

This technical specification concerns the supply of 266 custom designed fibre optic interface PCIe units, called PCIe40.

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1. Indent purpose and Scope of supply

The purpose of the indent is the supply of **266units of FPGA based PCIe40 Boards with optical I/Os along with Mezzanine cards and other accessories** for the ALICE experiment at CERN. **Each unit comprises of a motherboard and a power mezzanine card, if not mentioned specifically anywhere in this document.** The PCIe40 is a complex electronics board with the latest FPGA technology and more than 1700 components. The job includes components procurement, assembly, factory and onsite testing. The successful bidder shall supply the PCIe40 as defined in this technical specification and the

documents and drawings attached to it. The supply will be divided into a pre-series and series-production of two or more batches. The indenter reserves the right to survey the production site of the company before releasing the purchase order.

1.1 Deliverables Included in the Supply and required quantities

There are two types of PCIe40 boards or units (Type 1 and Type 2) as discussed below. The number of units to be manufactured is estimated to be:

- a) A **pre-series** totalling 24 units (12& 12 of each type);
- b) A **production batch 1** totalling 120series-production units (60&60 of each type);
- c) A **production batch 2** totalling 122series-production units (61&61 of each type).

The contractor shall provide a test data package composed of the following documents:

- i. Quality control record;
- ii. Test reports;
- iii. Certificate of conformity for each card and unit.

The contractor shall provide one year of basic warranty.

Description of the two types:

Although the PCB and the assembly of all soldered components shall be the same for all boards, the produced units are of two configurations. These "types" of the units are different only in the final mechanical assembly, that is, they differ only in the manually placed/populated optical components that go into sockets. The contractor shall manually mount these optical components to produce quantities of units as defined in the following table.

Type 1: "24TX/24RX": 133No. boards with 24 optical outputs and 24 optical inputs

Type 2: "00TX/24RX": 133No. boards with 0 optical outputs and 24 optical inputs

Note: Bill of Material (BOM) is the same for all the types except the number of optical transceivers and the number of optical ribbon cables to be placed manually.

The multilayer PCBs for assembly of the cards will be provided to the contractor by the indenter with the full documentation of quality inspection and proof of conformity.

1.2 Activities at the Contractor's Premises

The contractor shall perform the following activities at their premises:

- a) Quality inspection of the provided PCBs and report the results according to indenter's instructions;
- b) Ordering of passive and active components for the series-production in trays, reels, and cut tapes long enough for automated placement (manual placement is not allowed);
- c) Input quality control of all components;
- d) Assembly of the components on the PCBs and soldering;
- e) Quality control of the assembled boards (as mentioned in section 2.7);
- f) Production of complete units with the assembled PCBs, heat sink (with thermal gap filter), bracket (face plate), optical transmitters and receivers, and internal optical patch cords;
- g) Tests of the complete units including execution of tests specified by the indenter;
- h) Labelling, QR code, packing, and shipping;
- i) Diagnosis and repair or replacement of units during the basic warranty period.

Note: The series production shall be preceded by the production of a pre-series. Production of the series shall not start before the indenter has given its formal approval of the pre-series in writing. Subcontracting of the components assembly is not permitted.

1.3 Items provided by the indenter

The indenter will supply the contractor with:

- a) 268 PCBs for the mother board including 2 pcs spares;
- b) 268 PCBs for the power mezzanines including 2 pcs spares;
- c) Programmable Logic Programmers (PLC) needed to program the FPGAs or microcontrollers;
- d) Test bench for the power mezzanine;
- e) Test bench for the assembled PCIe40 units;
- f) Software and documentation for the execution of the required functional tests.

The PCBs will be shipped in 2 weeks from the date of acceptance of the order. The test benches along with software/documents will be shipped within 4 weeks of the date of acceptance of the order. However, this does not affect the delivery schedule.

Note: It is the responsibility of the contractor to perform input quality inspection of PCBs prior to assembly. In case the contractor identifies that any of these PCBs have been damaged during transportation, degraded due to incorrect storage or are of the wrong type, it shall notify the indenter in writing. The damaged components shall not be used for the production of the pre-series nor series-production.

In case PCBs are damaged during the assembly or testing, the contractor can order at its expense additional PCBs at the same cost granted to the indenter. The qualified contractor can obtain the cost from the indenter. All PCBs provided by the indenter (working or not) shall be returned to the indenter.

1.3.1 Documents supplied by the indenter

The PCIe40 units shall be manufactured on the basis of design documentation supplied by the indenter. The following documents are attached to the Technical Specifications:

- a) Schematics;
- b) Bill of Material (BOM);

- c) Pick & Place file and assembly drawings;
 - d) Technical drawings for bracket, heat sink and optical patch cords; with reference links and contact information for easy ordering of these components;
 - e) Description of the test procedure.
- Updated drawings, if any, will be provided at the award of the contract.

1.3.2 Documents available from the PCB manufacturer

For the PCB of the motherboard:

- a) Analysis of two metallographic cross sections for the motherboard coupon. The cross sections shall be etched in order to highlight the different copper layers. The cross sections shall be on each fabrication panel in the PCIe40 coupons located inside the handling strip of the board, one is in X, the second in Y axis;
- b) Results of an electrical test of each manufactured bare PCB;
- c) Results of an impedance measurement for each manufactured bare PCB by means of test coupon.

For the PCB of the mezzanine:

- d) Analysis of metallographic cross section for the mezzanine coupon. The cross sections shall be etched in order to highlight the different copper layers.

1.4 Basic warranty and repair

All units shall be delivered with a basic warranty of 1 (ONE) year starting from the date of acceptance by the indenter. During this period, the contractor shall maintain at its premises a test bench and tools that allow for the diagnosis of faults, shall purchase and replace the defective components and shall use the test bench to verify the units after the execution of the repair.

The repair turnaround time shall be at most 3 weeks starting from the reception of the broken unit by the contractor to the reception of the repaired unit by the indenter.

1.5 Optional: Extended warranty

The supplier is expected to quote for an extension of the basic warranty (as mentioned in 1.4) for an additional one year (i.e., two years in total) and an additional eight years beyond the two years period (i.e., ten years in total). The indenter would order the extension of the basic warranty at least six months before the expiry of the basic warranty.

2. Performance of the Contract

2.1 Delivery schedule

Once the contractor is notified of the award of the contract, the contractor shall deliver the supply according to the following delivery schedule:

- a) Pre-series of 24 Boards: Production, tests at the contractor's premises and delivery of Boards within 20 weeks from the date of the notification of the contract;
- b) Acceptance of the 24 pre-series Boards at the delivery location within 4 weeks after receiving the units at the delivery site;
- c) Production batch 1 of 120 Boards: Production, tests at the contractor's premises and delivery of 120 Boards within 6 weeks of the acceptance of the pre-series;
- d) Production batch 2 of 122 Boards: Production, tests at the contractor's premises and delivery of 122 Boards within 6 weeks of acceptance of the production batch 1 of 120 boards.

The delivery schedule must strictly be adhered to. In case of any unforeseen delay due to delay in the availability of components must be notified to the indenter in advance and agreed upon by the indenter and updated.

In summary, the production time from contract acceptance to final delivery is 32 weeks or less plus 3 periods of 3-4 weeks for acceptance tests (see 2.7.4). Should the production of the pre-series turn out to be with high yield the indenter might authorize the merge of both series-production lots to one.

The contractor may decide to deliver the series-production in sub-lots of 30/30/30/30(32). In this case reception testing, acceptance, and invoicing shall be calculated on the sub-lots basis. Note that in the case of sub lots delivery, the overall execution time of the contract needs to stay unchanged and no additional acceptance procedure is added before the subsequent sub lot will be manufactured. However, the 2 acceptance procedures before subsequent lot production between pre-series/first mass production and first/second mass production stay in place.

To meet the timeline, the contractor is advised to procure all the card components soon after the date of notification of the contract.

The indenter will install the testing tools at the contractor premises and will train the contractor staff. The contractor staff at the contractor premises will run the functional tests.

2.2 Delivery location

Delivery of all the units will be to CERN to the following address

Dr. Alex Kluge
CERN
CH-1211 Geneva 23
Switzerland

The approximate cost of delivery to CERN, Geneva, Switzerland may be mentioned separately and the same will not be part of the financial bid.

Acceptance tests will be carried out at CERN by ALICE collaborators.

2.3 Modes of payment

Invoices should be sent with the delivery of each batch as described in section 2.1 and payment will be released upon acceptance of the delivery batch at the delivery site based on the test results and acceptance criteria as mentioned later in section 2.7.4 or 4 weeks from receipt of consignment at the delivery site, whichever is earlier.

2.4 Production Process

The contractor shall manufacture the cards according to the Manufacturing Files provided by the indenter as described in sections 1.3 and 5. Deviation from these Manufacturing Files is not allowed. However, it is possible for the contractor to propose improvements to the Manufacturing Files. Those improvements can be either accepted or rejected by the indenter and, if relevant, shall be added to the Manufacturing Files.

2.5 Deviations from this Technical Specification

If the contractor discovers that the contractor has misinterpreted this technical specification, this shall not be accepted as a justification for deviation from the technical specification and the contractor shall deliver the supply in conformity with this technical specification at no extra cost.

The indenter reserves the right to modify this technical specification. Any change in technical specifications by the indenter and its consequences shall be mutually agreed between the indenter and the contractor.

2.6 Assembly of the units

The unit consists of a motherboard with a large FPGA and its associated logic on which a power mezzanine is mounted. It has a bracket on which are fixed two, four or eight optical patch cords coming from transceivers spread over the board. A passive custom heat sink is mounted on top of the main FPGA of the motherboard.

The power mezzanine is also cooled by several small passive custom heat sinks. Before running the functional tests, the following operations shall be done:

- a) Power mezzanine:
 - i. Mount the heat sinks over the power mezzanine.
- b) Motherboard:
 - i. Fix the bracket to the main board;
 - ii. Assemble the optical patch cords between the optical transceivers and the bracket;
 - iii. Mount the heat sink over the large FPGA;
 - iv. Insert the two SFP+ transceivers;

The power mezzanine shall not be mounted immediately on the main board because it shall be tested individually before (see Section 2.7).

Subcontracting of the component assembly is not allowed.

2.7 Testing of the Units

The contractor shall be responsible for the technical conformity of the units supplied to the contractor. Components of the test bench that are not commercially available will be provided free of charge by the indenter and remain the property of the indenter for the duration of the contract. In case of a malfunction of such a device the indenter will provide a replacement unit free of charge.

Two kinds of tests are to be performed:

- Basic tests of the board components
- Configuration and functional test of the boards

These are elaborated below.

The functional testing of the high-dissipating power mezzanine modules and main boards at full load are very much dependent on the card and component temperature. Therefore, an environment with controlled temperature is needed for the testing of the boards. The test beds provided by the indenter will have in-built cooling that cools the unit (maintains a proper silicon temperature) relative to the room temperature. The contractor shall provide an air-conditioned room for the testing with at least 4 workplaces for the entire duration of the testing. The temperature of the test room shall be kept under 22 °C continuously during the operation of the functional testing of the units.

The contractor shall provide good and reliably working internet connection for the test room. The internet connection is essential for the operation of the cards configuration and functional tests, logging of the results to the indenter's servers, and also for providing remote assistance and debugging help for the contractor.

2.7.1 Basic tests carried out by the contractor

- a) Inspection of Assembled Printed Circuit Boards;

The contractor shall individually inspect all parts according to the applicable standards (see section 3.5). Automated Optical Inspection of the soldered components and X-ray checking of the BGA soldering points are a mandatory part of the test procedure carried out by the contractor. All component defects and assembly errors shall be eliminated;

b) Mechanical and Optical Parts

The dimensions of the mechanical parts must be checked to ensure conformity, i.e. the dimensions shall be within their tolerances, in particular the thickness of the PCB, the shape and dimensions of the heat-sink, and the lengths of the optical ribbons;

c) Temperature cycling

Each mezzanine and motherboard will be tested with 2 thermal cycles following the IPC9701A standard (0 °C to 100 °C with 10 minutes dwells at both temperature extremes and an increase and decrease of temperature in the range 10 - 15 °C/min);

d) Flying probes test (basic electrical measurements)

A flying probe test will be run on each main board and power mezzanine after the temperature cycling. After this test, all component defects and assembly errors shall be eliminated.

e) Specific tests for the pre-series

The pre-series units will be tested in view of checking the PCB and the quality of assembly. For this purpose, before functional testing, the units (Power Mezzanine must be mounted on the PCIe40) will be subjected (unpowered) to 10 thermal cycles following IPC9701A standard (0 °C to 100 °C with 10-minute dwells at both temperature extremes and an increase and decrease of temperature in the range 10 -15 °C/min). Also, a burn-in test on the indenter's side will be performed on each boards of the pre-series.

f) Specific tests for the series-production on a sampling basis

The temperature cycling test and burn-in test described in the bullet above will be performed on one unit chosen randomly from a batch of every 30 units.

2.7.2 Configuration and Functional Tests carried out by the contractor

A functional test for each assembled board shall be performed. The indenter will supply the required test equipment to the contractor and the indenter personnel will undertake the training of the contractor's staff for using the equipment. The assembled boards shall be first personalized by QR code stickers, and the automated functional tests will be driven by the information reading from the QR code labels by a QR code reader. Printing and applying the QR code stickers is the task of the contractor. The size of the QR code labels are 10mm x 10mm.

The functional tests are performed in three steps; Step_A, Step_B, and Step_C.

- i. Step-A: Configuring and functional testing of the power mezzanine cards. The mezzanine is inserted in a specific test bench containing up to 8 cards. The test is driven by a PC workstation logging the results of the testing of the power mezzanines under full load. The duration of the test of 8 cards is estimated to 5 minutes after the setup time.
- ii. Step-B: Configuring of the PCIe40 main board equipped with the already tested power mezzanine. Faceplate, heat-sink, optical transceivers, and optical ribbon cables are all mounted to the main board (mechanical and optical assembly). On-board switches are set to their default positions. After power-on, all components of the PCIe40 module that need permanent configuration shall be configured first. These steps will be carried out by a dedicated test bench by connecting the fully assembled module to a Windows PC with a USB cable.
- iii. Step-C: This step consists of Functional testing of the assembled PCIe40 modules: The power mezzanine is mounted on the motherboard and the whole unit is inserted into a server rack containing up to 4 or 8 units (depending on the server type provided) and connected to the PC-server which will drive the test and store the results as well as the board information. The duration of the test of 8 units simultaneously is estimated to 15 minutes. The functional tests cover the vast majority of the entire functionality of the card. All items requiring component changes, re-soldering, etc. shall be classified as untested and shall be passed through the entire test procedures again.

2.7.3 Test Report

A test report shall be provided with every power mezzanine, motherboard and units. The report shall comprise:

- a) The card's serial number;
- b) Manufacturing and test date;
- c) Name of person performing the test;
- d) Reference to or copy of assembly AOI (Automatic Optical Inspection) and X-Ray test result;
- e) Reference to PCB batch and serial numbers (unless identical to card serial number);
- f) Cross-reference to or copy of PCB electrical and impedance test results provided by the PCB manufacturer;
- g) Description of the executed test sequence (e.g. insert, boot, installation of test tools/fiber, functional test, power down, etc.);
- h) Overall test result, as given by functional test;
- i) Detailed report of functional test (user defined) as an attachment.

2.7.4 Tests carried out at the Delivery site (CERN)

Reception tests (Step-D) will be performed at the delivery site (CERN) to establish that each unit meets the technical specification and that no damage or changes have occurred during transport. These tests will be run on each of the boards. The test will consist of repeating the very same functional tests and let them running for certain amount of time under the same load of the FPGA as in Step-C. They will be considered as successful if no error is detected in the test logs (Just like the tests in Step-C).

A representative of the contractor is not required for these tests but may be present.

In the event of any manufacturing errors found during the acceptance test, the faulty cards will be returned to the contractor who shall correct them. Final acceptance of a batch will be granted after reception tests run successfully. The indenter shall notify the contractor on the outcome of the reception tests..

The quality acceptance criteria for the pre-series is 22 out of 24 units and the expected repair cycle is 3 weeks starting from reception of the broken unit by the contractor to the reception of repaired unit by the indenter.

A production series is accepted only if at least 95% of the cards are found to be satisfactorily working after the reception tests.

In the event that during the warranty period, the units do not fully meet this technical specification, the indenter reserves the right to repeat the acceptance tests. The contractor at his expense shall correct any deviations from the specification.

Specific long-term tests at the delivery site

- a) Specific tests for the pre-series:
The pre-series will be inserted in server class PC and a long-term (multiple days of) continuous acceptance tests will be performed;
- b) Specific tests for the production series on a sampling basis
The same long-term test described in the bullet above will be performed on one board chosen randomly from every 30 boards for the extended temperature cycling.(See point 2.7.1. f).

2.7.5 Tests failure

The following procedure shall be followed as soon as defaults are detected:

- a) Open and fill the nonconformity report in electronic form.
It mainly contains the list of failing tests as well as reference to the full test report;
- b) Send the nonconformity report to the indenter and setup a conference call with the indenter's experts of the PCIe40 unit;
- c) Send the unit to the indenter when issues cannot be resolved by the conference call. Exhaustive debug procedures will be run by the indenter's experts in order to understand issues;
- d) Send back the unit to the contractor, if it can be repaired, otherwise it is considered as failing the acceptance test and destroyed;
- e) Run the functional test at contractor;
- f) Run the functional and the acceptance tests at the indenter's site;
- g) Close the nonconformity report; this formal operation happens as soon as a decision is taken. The report is distributed to the contractors and to the indenter.

The number of units that pass through this procedure shall not exceed 5% of the units within a batch.

2.8 Contract Follow-Up and Progress Monitoring

The contractor shall assign a person responsible for the technical execution of the contract and its follow-up, as well as a person responsible for the commercial follow-up, throughout the duration of the contract. They shall be able to communicate in English.

The contractor shall send a written progress report to the indenter every two weeks until completion of the contract. All communications and documents shall be in English.

This report shall include all the necessary information, in particular actual progress in comparison to scheduled progress.

Detailed log files of the functional tests and board information will be automatically uploaded to the indenter's servers through internet connection.

2.9 Packing and Shipping

The contractor is responsible for the packing and, where specified by the indenter, for the transport to the indenter. In all cases, the contractor shall ensure that the equipment is delivered to the indenter without damage and any possible deterioration in performance due to transport conditions. **The contractor needs to obtain proper insurance for transport (commensurate with the value of the cards).**

The contractor shall comply with professional regulations in matter of packing and shipping. In particular with the following:

- a) Each assembled and tested unit shall be individually packaged in a metallized ESD protective bag that is closed with an ESD Sensitive Product warning label. The use of pink polyethylene ESD protective bags is not accepted.
- b) Each single unit in its ESD bag shall be placed in an individual cardboard box with appropriate shock absorbing material.
- c) Each assembled unit shall be individually identified and associated with the PCB "test coupon".

2.10 Spare Parts

It is the responsibility of the contractor to provide spare parts for the duration of the warranty period of the units (except for the components supplied by the indenter). Replacements of components (e.g. due to obsolescence) are subject to negotiation with the indenter and shall be approved by the indenter. For the components supplied by the indenter, it is the indenter who will track obsolescence and look for alternative components.

3. Technical Requirements

3.1 General Description

The supply concerns fibre optic interface units in PCIe form factor. Each unit consists of a mezzanine mounted on a motherboard. They house a wide range of active and passive components of several packages types. In addition, the motherboard drives 132 high speed serial links at up to 10 Gbits/s and currents in the PCB up to 60 A. A brief overview of the key parameters and technologies used for the units is given below. Further details can be found in the files listed in section 1.3.

Each unit consists of the following hardware components and technologies:

- a) Standard Gen3 PCI-Express form factor PCB, with 16 lanes edge connector interface,
- b) Intel Arria 10 FPGA (1932 pins BGA package) and fine pitched packages (0.50 mm)
- c) Up to 4 pcs of socket-mounted 12-lane parallel optical transmitters, and up to 4 pcs of socket-mounted 12-lane parallel optical receivers providing up to a total of 48 bidirectional optical links with signalling rates up to 10 Gb/s per link. (These optical components are connected through the PCB lanes directly to the FPGA gigabit transceiver pins.)
- d) These optical components are also referred to as Avago/Broadcom TX and RX Minipods;
- e) 2 SFP+ transceivers with signalling rates up to 10 Gb/s per link;
- f) Various surface mount components with fine pitched packages (incl. QFN packages);
- g) Miniaturized passive components (0201 minimum);
- h) A few pin-through-hole components (e.g. SMA connectors, jumper pins) to be soldered manually;
- i) A power mezzanine board to be produced by the contractor;
- j) Mechanical components, including heat sink, thermal gap pad, bracket, various screws, nuts and washers;
- k) 12-lane connectorised optical ribbon cables with customized lengths connecting the optical transmitters and receivers to the faceplate optical adapters.

3.2 Printed Circuit Boards

The key parameters of the *main board* PCB are:

- a) Overall PCB dimensions: 241.3 × 111.15 mm, contoured according to PCI Express Card Electromechanical Specification Revision 3.0;
- b) 14 layers high temperature, low loss material ($\epsilon_r < 3.7$ at 5 GHz, $D_f < 0.012$ at 5 GHz);
- c) Maximum overall thickness of (1.57±0.13) mm;
- d) 18/35/70 µm copper;
- e) 50/100 µm core & prepreg;
- f) 0.09 mm min. trace width and clearance;
- g) Differential controlled impedance 85 and 100 Ohms (tolerance ±15%);
- h) Single ended controlled impedance 50 Ohms (tolerance ±15%);
- i) Full & blind vias, 5 drill groups (1-2, 2-3, 12-13, 13-14, 2-13), vias in pads;
- j) More than 10 000 vias among which 67 % are microvias.

The key parameters of the *power mezzanine* PCB are:

- a) Overall PCB dimension: 90 × 70 mm
- b) 6 layers high temperature, standard FR4 material;
- c) Maximum overall thickness of (1.57±0.13) mm;
- d) 35/70 µm copper;
- e) 250 µm core & prepreg;
- f) 0.125 mm min. trace width and clearance;
- g) Full & blind vias, 3 drill groups (1-6, 1-2, 5-6), vias in pads.

The PCB for the *main board* is the most critical item since it embeds a large number of staggered vias connected to expensive components with 2 000 high density connections. In addition, it has to deal with strong requirements on the impedance and carry high current flow.

The multilayer PCB is provided by the indenter (see section 1.3). The contractor shall be responsible for the quality inspection of the received PCBs and take the responsibility for the accepted ones.

Any PCBs to be held in stock for more than one month shall be dried out and sealed in appropriate moisture barrier bags with a small bag of desiccant inserted. The IPC standard 1601 shall be applied.

3.3 Material

3.3.1 Material and Components Purchasing

The contractor shall purchase all materials and components exactly as specified in the BOM listed in the Manufacturing Files. The selected components are RoHS compliant (see Section 3.5). No alternative components shall be used without the indenter's written approval. The contractor shall procure components from official distributors. It shall not procure component from brokers without a written agreement from the indenter.

The components are:

- a) Intel Arria10 FPGA (the fibre optic interface PCIe unit is a project, which is followed by the Intel Company. Please specify that Arria10 FPGAs are for the project ALICE when negotiating with the official distributor);
 - b) Broadcom "Minipod" optical transmitters and receivers (socket mounted);
 - c) Surface mounted (SMD) integrated circuits;
 - d) Surface mounted (SMD) discrete devices such as resistors, capacitors, diodes, transistors, ferrites;
 - e) Connectors and sockets;
 - f) Custom heat sink from Japan company, PCIe40_V2.2_Heat_Sink:
 - o Alpha Company Ltd.
 - o 256-1 Ueda
 - o NUMAZU-City
 - o 410-0316 SHIZUOKA JAPAN
 - o Contact: Mr Takashi Yanagidaira Tel: +81 55 966 0789
 - o Email: t-yanagi@micforg.co.jp;
1. Optical patch cords (PCIe40_V2.2_Optical_Patch_Cords);
 - o Sylex, s.r.o.
 - o Mlynské luhy 31
 - o 821 05 BRATISLAVA 2
 - o SLOVAKIA;
 - o Contact: Michal Vincze, Tel: +421 2 4820 1828
 - o Email: mvincze@sylex.sk
 - o Web: sylex.sk
 2. Bracket (a.k.a.face plate), (PCIe40_V2.2_Face_Plate);
 - o L.T.I. (Loire Tolerie Industrielle)
 - o 1, rue Gutenberg
 - o 42340 VEAUCHE
 - o FRANCE.
 - o Contact: Tel: +33 4 77 94 37 23
 - o Email: lti.tolerie@wanadoo.fr;
 - o Web: www.lti.fr

The testing of standard components (that is all non-customised components ordered from electronic distributors) is not required. However, the contractor shall check that the correct components have been received.

If you need any help please contact the indenter for a possible list of suppliers.

The contractor is asked to provide the sources of all components at time of the bid.

3.3.2 Traceability

The contractor shall at the end of the production period provide in a spread-sheet file the date, code and specific reference (manufacturer) of each component used for the execution of the production. This allows, upon discovery of a faulty component, ascertaining whether the whole production is affected or not. Certificate of Conformance (CoC) must be provided from the original manufacturer for the active components.

3.3.3 Storage

The indenter requires a strict procedure to be applied to protect all components in goods reception and storage areas. This is particularly important for surface mounted devices. The components shall be stored in conditions that minimize the growth of oxides on surfaces to be soldered and held in sealed bags or boxes containing dry desiccant (e.g. Silica Gel). In addition, before mounting, components shall be dried 24 hours in a stove.

3.4 Assembly work

3.4.1 Assembly of the Printed Circuit Boards

The assembly of the PCBs will consist of placing and soldering of surface mounted components on both sides of the cards followed by the manual soldering of a few pin-through-hole components. The application of the IPC Standards Class 2 (see Section 3.5) shall be fully respected, especially for the following points:

- a) Handling Electronic Assemblies;
- b) Component Installation Location/Orientation;
- c) Soldering Acceptability Requirements;
- d) Cleanliness Acceptability Requirements;
- e) Marking Acceptability Requirements;
- f) Surface Mount Assemblies Acceptance Requirements.

The cards shall be soldered using lead-free solder and shall be RoHS compliant. Either reflow or vapour phase soldering can be used, with a preference for vapour phase soldering.

In any of the two cases, thermal profiling is required by sacrificing a main and a power mezzanine board in the test soldering procedure needed for the thermal profile investigation. For such test soldering, thermally equivalent dummy of the FPGA (e.g a functionally faulty one, or thermal dummy available from the component manufacturer) can be used.

3.4.2 Cleaning

Both sides of the assembly shall be cleaned and a test for ionic residues is required (IPC/EIA J-STD-001, Cleanliness Designator C-22). Also, after rework or repair, cards shall be cleaned to meet the Cleanliness Designator C-22.

3.4.3 Identification

Each assembled card shall be individually identified with a QR code. It shall include the batch number and a unique identification number for each card, as well as its version if modifications are made during the manufacturing period. The unit number will be the same as the motherboard number. Its associated power mezzanine card will be stored in a database describing the associations.

3.5 Applicable Standards, Rules, and Regulations

The supply shall comply with CERN and European regulations, including but not limited to:

3.5.1 Applicable International Standards

Hazardous material content for substances listed in the RoHS Directive shall be within the limits defined in EU Directives 2011/65/EU and 2012/19/EU and relevant amendments.

The contractor must have a valid ISO 9001:2008 series certification appropriate to the subject of the specification. The same regulations apply for sub-contracts.

For the assembly of the units, the following international industrial standards shall be followed and met:

1. IPC Standard IPC-A-610 (Class 2);
2. IPC Standard IPC/EIA J-STD-001 (Class 2);
3. Cleanliness Designator C-22 (both sides of assembly to be cleaned; test for ionic residues required).

In case of conflict, IPC-A-610 shall prevail IPC/EIA-J-STD-001.

3.6 Manufacturing and Tooling

The contractor shall follow all the necessary operations and shall have available all the tooling for the proper execution of the contract.

The process and equipment for the main board assembly shall comply with the following steps:

- a) MSL controlled storage of the components and the PCB;
- b) Baking of the components (as per the data sheets) and the PCB (minimum 12h@110°C);
- c) SAC 305 (Tin 97%/Silver3%/ Copper 0.5%) solder paste coalescence test;
- d) SPI (Solder Paste Inspection) in 3D is mandatory in order to guarantee good solder paste deposition
- e) Pick and place and test solder a PCB for a soldering thermal profile investigation shall be made with tooling (solderStar, Datapack, ...) (See also section 3.4.1)
- f) Full AOI (Automated Optical Inspection) control, X-ray inspection, and flying probe test shall be made after thermal stressing of the assembled boards (main board and mezzanine, specific life cycle tests see 2.7).

As a general rule, the components placement shall be fully automated. Manual placing of SMD components (based on assembly drawings) is strictly not permitted. For any exception from automated placement, the contractor shall negotiate with the indenter, and ask for a written agreement. In all cases the Pick&Place file shall rule the components positioning. (Human readable assembly drawings are provided only as a further help.)

3.7 Operational Conditions and Environmental Conditions

The unit (the combination of the motherboard and the power mezzanine card) will be supplied by a 12 V power supply and can dissipate up to 150 W. The units will be used in server-grade PCs and operated 24/7. The air temperature inside of the PC will be between 10 and 40 °C. During operation, the unit temperature will be at most 35 °C and can exceptionally be higher for short periods of time. The humidity will be 10-80 % non-condensing. The units are expected to operate for 10 years.

3.8 Quality Assurance and Documentation

The following quality assurance operations shall be done:

- a) PCB and components entrance inspection;
- b) 3D SPI;
- c) Full AOI;
- d) X-ray inspection;
- e) Marking of each card with a QR code containing the manufacturer's identifier and the date of manufacturing (year and week);

- f) The staff involved in quality control shall be IPC certified and follow IPC class 3 standards for the following:
 - iii. the mezzanine and motherboard assembly;
 - iv. the repair of units.

A written record of these test results shall be presented to the indenter for each card, see also section 3.8.1. It shall bear an individual manufacturer's identifier and the date of manufacturing (year and week).

Description of the tests for the PCIe40_v2.2 *power mezzanine*, the PCIe40_v2.2 *main board* and the *fully assembled PCIe40 v2 units* are all described in the Annex with the expected content for control records. Fully detailed technical documentation of the test procedures will be provided by the time of contracting.

3.8.1 Quality control records

All specified tests and measurements carried out during all stages of production, from raw material procurement up to delivery and installation should be recorded. All cards shall be produced according to ISO 9001 such that complete conformity with the requirements of this specification is achieved.

This process includes individual sub-assembly inspection and test procedures accompanied by written records in electronic format at each stage, and shall allow all faults to be rapidly located, identified and their causes eliminated by the contractor. The contractor shall carry out any modifications to the material resulting from a systematic manufacturing fault on all cards. It cannot be sub- contracted and it shall be done at the contractor's cost.

- a) The contractor shall submit all documents produced in electronic format:
- b) Text documents in Microsoft Word®, or OpenDocument Text (.odt) and/or PDF format;
- c) Schedule in Microsoft Project® or in Microsoft Excel®, or OpenDocument or in PDF format, if needed, OpenDocument formats.

4. Qualification for the assembly of the PCI40 Boards

The potential bidder for the development of the PCIe40 board, the firm shall satisfy the specific criteria as detailed below:

4.1 Type of Firm

- a) In order to qualify for the bid, the respondent should be a private limited company/public limited company/proprietorship firm *etc.* except joint venture, whose competence and experience cover all the specified technical domains for this project and meeting all the requirements below.
- b) Financial Solvency: The firm must have an annual turnover of rupees 25 Crore or more for Engineering and manufacturing services (EMS) for last 3 years.

4.2 Administrative Situation

The firm shall

- d) not be involved in bankruptcy proceedings, prosecution for debt, sequestration or any analogous situation arising from a similar procedure provided for in law;
- e) not have made arrangements of any kind with creditors for their benefit;
- f) not have been subject of a judgment for fraud, corruption or any other illegal activity.

4.3 Competence and Experience

- d) The firm shall have **in-house facility and proven experience** in the field of manufacture of assembly of highly complex PCBs with FPGAs with more than 1000 ball grid array (BGA) connections of 0.5 mm pitch, QFN and QSP packages with a 0.4 mm pitch, and passive components of size 0201, in a highly automated CAM controlled industrial process. Manual

placement of components by assembly drawings is strictly forbidden even at lower quantities. (Assembly drawings can be used only in crosschecking and verification).

- e) The firm should have expertise in testing PCBs with FPGAs with at least 1000 ball grid connections of the size 0.5 mm and smaller as well as high speed (10 Gb/s) optical link components or similar.
- f) The firm shall provide at least two references/purchase orders of projects that are similar in scope, complexity and volume since 2013. The Indenter reserves the right to verify the references provided.

4.4 Size of the Firm

- c) The firm must have at least 10 technical employees in the field of component assembly of boards and quality testing of such mounted PCBs.
- d) Capability of testing shall cover optical inspections, 3D X-ray imaging, as well as the competence of electrical measurements and functional testing of complex, high speed (~10 Gb/s) digital circuits.

4.5 Technical Compliance

The firm shall demonstrate the ability of working according to industrial standards like IPC standard for class 3 PCB assembly.

4.6 Communications

The firm shall make available at least one commercial contact person and one technical contact person for the entire duration of the contract.

5. Annexes

Technical Annex to the Technical Specification, that includes the technical file set for the tendering procedure. The file package includes:

- PCIe40 V2.2 Main Board BOM file
- PCIe40 V2.2 Power Mezzanine BOM file
- PCIe40 V2.2 Non-electronic components BOM file
- Main Board and Power Mezzanine assembly drawing files
- Mechanical and optical assembly instructions
- Mechanical models (3D view) of the modules
- Abstract of the Testing Procedure

The file package can be downloaded from a **cernbox** link:

<https://cernbox.cern.ch/index.php/s/KOIyY5xs0sOgN58>