


Cover page to the tender document

	<b>ELECTRONICS CORPORATION OF INDIA LTD</b> <b>(A Government of India Enterprises)</b> Communication Systems Group, ECIL(PO), Hyderabad - 500 062	

Name of Organisation	Electronics Corporation of India Limited, Hyderabad - 500 062 {A.P.}		
Type of Organisation	Public Sector Undertaking	Ministry : Department of Atomic Energy	
Tender Ref. No :	ECIL/CNSG-MMD/S/09-4454PT		
Tender Title:	Supply of Integrated Platform for Development of Waveform Generation.		
Product Category	Electronic equipment – Software & Hardware		
Document Cost:	Rs. 2,000		
Tender Value	EMD : Rs. 2,00,000/-	Security Deposit: @ 10% of order value	
Tender type:	Buy		
Location:	Hyderabad {A.P.}		
Request for quote date	12.12.2013		
Last date for submission of bids	18.01.2014 up to 15.00 hrs.		
Opening date of Part I	20.01.2014 @ 14.00 hrs.		
Description of Item:	Item Description	Quantity	
	Integrated Development Platform for Waveform Generation	1 Set	
Pre – Qualification	As per specifications given in the tender		
Tender Document	<a href="#">View Tender Document *</a>		
Bid Document	<a href="#">View Price Bid Document *</a>		
Technical Document	<a href="#">View Technical Document *</a>		
Sector:	Electronics		
State:	Andhra Pradesh		
For further Information Contact: DGM, MMD-CNSG, ECIL			
E – Mail:	<a href="mailto:cndmmd@ecil.co.in">cndmmd@ecil.co.in</a>		
Phone:	+94-40-2712 1471		
Fax:	+91-40-2712 1606		

**Electronics Corporation of India limited**  
**(A Government of India enterprise)**  
**Communication Systems Group, ECIL (PO)**  
**Hyderabad – 500062 {A.P.} India**  
**Telephone : +91-40-2712 1471, Fax :+91-40-2712 1606**  
**E-mail: [cndmmd@ecil.co.in](mailto:cndmmd@ecil.co.in) {<http://www.ecil.co.in>}**

---

Tender No: ECIL/CNSG-MMD/S/09-4454PT

### **Tender Document**

#### **1. Invitation to Tender:**

Electronics corporation of India limited, communication system group invites “Two part Bid” for “Supply of Integrated Development Platform for Waveform Generation” as per details given below.

#### **2. Important Dates**

Due date for submission of Two Part Bids: **18.01.2014 up to 15.00 Hrs.**

Techno-commercial bid (part 1) will be opened on **20.01.2014 at 14.00 Hrs.** Interested vendors may be present with prior permission.

After evaluation of the techno- commercial bids, qualified list of vendors will be finalized.

Price bid (part 2) of the qualified vendors will be opened at a later date, which will be communicated to the qualified vendors.

#### **3. Manner and method of submission of offers:**

All pages of the tender shall be numbered and typed on the letter head of the vendor and be duly signed and stamped by company’s authorized signatory. Hand written quotation will be summarily rejected. Corrections if any shall be duly authenticated with signature and seal of the company.

The quotation in prescribed form to this invitation shall be submitted in two parts and in different sealed envelopes super scribing tender number with due date.

Part-I (Technical Bid): It shall comprise of two sections namely technical section and commercial section and both sections shall be submitted along with tender fee and EMD in a single sealed envelope.

This bid shall not contain any price details.

Part-II (Price Bid): It shall comprise of price details and shall be submitted in a sealed separate envelope.

The above two sealed envelopes of Part-I & Part-II shall be put in a single sealed envelope and submitted to the attention of Deputy General Manager, CNSG-MMD, ECIL Post, Hyderabad 500 062, AP, India.

#### **4. Cost of Tender Documents:**

Tender fee of Rs. 2,000/- is to be remitted along with the techno-commercial bid in the form of a crossed bank draft favoring “Electronics Corporation of India Limited” from a nationalized bank payable at Hyderabad. The cost of tender document is non- refundable.

## **5. Earnest Money Deposit (EMD):**

Earnest money deposit of Rs. 2,00,000/- shall be submitted along with the techno-commercial bid in the form of demand draft favoring Electronic Corporation of India Limited or a Bank Guarantee valid for a period of six months drawn from a nationalized bank payable at Hyderabad. The EMD deposited by the unsuccessful bidders will be refunded without interest after finalization of the order. The EMD of the successful bidder will be appropriated towards security deposit. The bids will not be considered in the absence of payment towards the cost of tender documents and EMD.

## **6. Security deposit (SD)**

The successful bidder will be required to remit a Security deposit equivalent to 10% of the purchase order value exclusive of taxes and duties etc. after adjusting the EMD amount already remitted. SD is to be remitted along with the order acceptance in the form of a crossed bank draft favoring Electronic Corporation of India Limited or a Bank Guarantee from a nationalized bank payable at Hyderabad. The security deposit will be forfeited in the event of failure to execute the purchase order. The security deposit will be refunded without interest after the purchase order is successfully executed to the satisfaction of the purchaser.

## **7. Items tendered for:**

Sl. No	Items description	Qty
01	Supply of Integrated Development Platform for Waveform Generation. (scope & details are given in the technical document)	1 set.

Intending bidders who have not yet registered with ECIL are also requested to download “Suppliers Registration Form” from web site [www.ecil.co.in/tenders](http://www.ecil.co.in/tenders), fill it up and send the same along with the bids.

## **TENDER SUBMISSION FORMAT (PRICE BID DOCUMENT)**

Tender No: ECIL: CNSG-MMD:S:09-4454PT

Date:

### **I Vendor Particulars:**

Name and address of the bidder	
Telephone, fax and e-mail	
Name and designation of the Officer representing Vendor	

### **II Items tendered for:**

Sl. No	Items description	Qty	Rate	Value
01	Supply of Integrated Development Platform for Waveform Generation	1 Set		
02	Extended Warranty for 2 years after completion of free standard warranty period of 1 year.	Lot		

### **III Terms and Conditions:**

1	Terms of price	
2	Payment terms (please refer General Terms and Conditions of this tender)	
3	<p>Rate of Excise duty, Service Tax, and any other taxes and duties applicable. (In case the Vendor imports any item directly Customs duty exemptions will not be provided by ECIL)</p> <p>Note: Vendor shall specifically mention applicability of all taxes and duties. In the absence of specific confirmation of taxes and duties, the quotation is liable to be rejected.</p>	
4	Tendered items are required immediately. Vendors are requested to quote earliest possible delivery schedule.	
5	Standard Warranty (Minimum 1year from the date of installation)	

6	Estimated Packing & Forwarding Charges	
7	Validity of Quotation (Minimum 90 days)	
8	DD No. & Date for Cost of Tender Documents.	
9	DD No. & Date for EMD.	
10	CST Registrati0n Number	
11	TIN Number.	
12	Income Tax PAN Number	
13	ISO-9000 Certificate or any other certificate	
14	SSI/NSI Registration Number, if applicable.	
15	Any other relevant information	

**Note :** The vendor shall submit offer in the above format only. Against each instructions mentioned below the Vendor shall give a comment Complied ( √ ) or Not complied ( x )

**Instructions:**

- a. No Columns shall be left blank in the format.
- b. Incomplete forms, counter offer and deviation from the terms and conditions will be summarily rejected.
- c. Photostat copies of quote/offer will not be accepted. Only originals received within the time limit will be accepted.
- d. The vendor shall submit the certificate of Registration under Micro, Small and Medium enterprises development Act, 2006, in case of applicability.
- e. The offer shall meet point wise compliance to all points of tender document. Wherever non-compliance is there, suitable explanation needs to be provided.
- f. Technical proposal need not be restricted to the user requirements as given above. Any additional features may be added in the proposal to make it a professional package.
- g. Technical proposal may be as detailed as possible with functional block diagrams where ever applicable.
- h. Foreign vendors shall offer bids directly or through their Indian Partners / Representatives.

**General criteria for acceptance of tenders**

1. **Technical specification:** vendor shall comply with the technical specification given in the technical document. The commercial offer of the vendor who satisfies the technical requirement only will be opened – complied/ not complied
2. **Experience:** vendor shall provide details with documentary evidence the experience in supply of similar systems - complied / not complied.
3. **Warranty:** 1-year free warranty and support for additional 2 years to be provided against all manufacturing defects and software updates - complied / not complied.

4. Foreign vendors shall have a branch office in India / Indian partners / representatives for rendering support service - complied/not complied
5. **Facilities:** details of factory assembly and testing facility shall be furnished. A committee of ECIL may visit to verify the facilities of the vendors for execution of order if any.
6. **Service center:** Details of service center location/engineers working.
7. **Acceptance of tenders:** No tender will be accepted after due date. ECIL will not be responsible for postal/courier delay or lost in transit if any.

**Note:** vendor shall provide documentary proof to prove his adherence to the qualifying criteria where ever necessary. Claims without support will not be considered.

### **GENERAL TERMS AND CONDITIONS**

This tender and any order resulting from this tender shall be governed by the following terms and condition of contract and the supplier quoting against this tender shall be deemed to have read and understood the same. In case counter terms and condition of business have been offered by the supplier, ECIL shall not be deemed to be governed unless specific written acceptance thereof has been obtained from ECIL.

1. **Terms of prices:** Quotations shall be submitted on FOR Hyderabad or FOR destination basis including transit insurance. In case of Ex-works / Ex-go down / FOR dispatching station the approximate packing, forwarding and freight shall be indicated by the suppliers. Hyderabad suppliers shall arrange free delivery at our stores.
2. **Validity of quote:** The quotation shall remain valid for a minimum period of 90 days from tender opening date.
3. **Performance Bank Guarantee:** Vendor shall submit a performance bank guarantee for 10% of purchase order value covering standard free warranty period of 1 year from the date of acceptance of goods by ECIL.
4. **Payment:** Payments for materials and services will be made within 60 days from the date of acceptance of goods and services on pro-rata basis by ECIL.
5. **Insurance:** The supplier shall insure goods for all transit risks if the payment term is FOR Hyderabad or FOR destination unless otherwise stated specifically by the supplier in their quotation. The supplier shall insure goods for all risks till acceptance of goods by End user.
6. **Liquidated damages:** Delivery date is the essence of the contract. In the event of any delay in supply beyond the agreed delivery schedule, liquidated damages will be recovered @0.5% per week of delay or part thereof subject to a maximum of 10% of the value of the order.
7. **Force majeure:** If the execution of the purchase order is delayed beyond the period stipulated in the purchase order as a result of outbreak of hostilities, declaration of an embargo or blockage or fire, flood, acts of nature or any other contingency beyond the supplier's control due to act of God, then

ECIL may allow such additional time by extending the delivery period as justified by the circumstances of the case and its decision in this regard shall be final. Power failure will not be considered as a force majeure condition.

- 8. Risk purchase:** In case of failure to deliver the goods within the delivery date stipulated in the purchase order unless prior extension of delivery period is obtained, ECIL will be at liberty to obtain such items as necessary from other source and / or cancel the order and in either case ECIL reserves the right to recover from the supplier the additional amount spent plus 10% to cover incidental expenses.
- 9. Dispute resolution:** Any dispute arising out of purchase order or interpretation of any clause or terms and conditions hereof shall be settled through conciliation by both ECIL and the supplier, under the specific provision of arbitrational and conciliation act 1996. Only courts in Ranga Reddy district, state of Andhra Pradesh, India have exclusive jurisdiction over this order.
- 10. Right to reject:** The purchaser reserves the right to reject any or all offers wholly or in part without assigning any reason.
- 11. Short closure:** ECIL has the right to short close the tender even after evaluating the quotations without assigning any reason.
- 12. Bank details:** The supplier shall give along with the quotation name of their banker, account number and also income tax permanent account (PAN).
- 13. Jurisdiction:** All disputes arising in connection with executing the purchase order will be subject to jurisdiction of the courts in Hyderabad and Secunderabad only.

## **TECHNICAL DOCUMENT**

### **Integrated Development Platform for Waveform Generation**

#### **1. INTRODUCTION:**

Electronics Corporation of India would like to develop Waveforms as per Software Communication Architecture Version 2.2.2. We invite bids from potential solution providers to offer a comprehensive Integrated Development Platform comprising of hardware and software. The platform shall serve as an open architecture reference implementation platform facilitating Waveform development. It should provide the entire signal - chain hardware from antenna to baseband along with a complete suite of software & development tools as a single integrated development system.

#### **2. System Features:**

The Integrated Development Platform should be a comprehensive solution with the following features-

- a. Fully configured Integrated Development System; the hardware and software components shall be fully functional and operational ready for rapid application development and waveform porting.
- b. Integrated development System comprising entire signal chain hardware from antenna to baseband covering RF, IF and Baseband processing and external interfaces.
- c. The system shall employ reconfigurable processing elements like Field Programmable Gate Array (FPGA), Digital Signal Processor (DSP) and General Purpose Processor (GPP).
- d. System consisting of a comprehensive suite of Software & tools for waveform development.
- e. Provides SCA (v2.2.2) compliant software operating environment including SCA Core framework & associated Tools & Object Request Broker (ORB).
- f. POSIX compliant Real Time Operating System (RTOS).
- g. TCP/IP Stack.
- h. Availability of variable / user programmable IF selection for future requirements.
- i. Compact Chassis along with built in power supply and air-cooling.



- j. The system shall have a separate high speed data bus (or fabric) allowing flexible high performance and throughput channelized data flow.
- k. Standard interfaces- RS232, JTAG, Gigabit Ethernet should be provided.
- l. The system shall have large analog bandwidth (Rx and Tx).
- m. Suited for fast Frequency Hopping applications.
- n. Integrated Board Support Package (BSP) that supports the RTOS running on the hardware platform.
- o. Support for DSP development kit
- p. Support for FPGA development tool flow.

### **3. System Requirements:**

The Integrated system package shall address the following major hardware, software and other requirements. All the modules / software must be compatible and should also provide SCAv2.2.2 based application development environment.

#### **3.1 Hardware:**

##### **3.1.1 Major Hardware Sections:**

The hardware of the development platform shall consists of the following major processing sections-

##### **a. Baseband Processing :**

A heterogeneous combination of GPP, DSP and FPGA processing elements should be available for baseband processing. Dedicated high throughput and low latency data paths shall be available between all processors and important external interfaces. A separate control path is preferable.

##### **b. IF Processing :**

The system should have processing capability for IF to digital conversion (vice-versa) with user programmable IF up to minimum 70 MHz.

##### **c. RF Processing:**

- d. RF processing supporting high linearity wideband RF transceiver functionality with independent Tx and Rx channels. Each channel shall support signals in wide frequency range with large analog signal bandwidth.

### **3.1.2 Major Hardware Components and items**

The following major hardware components/items are necessary for the system-

- a. General Purpose Processor (such as Power PC) with Min 256 MB SDRAM, Min 64 MB Flash Memory. The GPP shall have a Board Support Package (BSP) to support POSIX compliant Real Time Operating System. GPP shall boot from a flash or a host file system. The processor is should be suitably powerful for baseband processing and system control requirements.
- b. Reconfigurable user programmable FPGA(s) (such as Xilinx Virtex-4 or higher series) suited for high performance RF, IF & Baseband signal processing tasks. They should be capable of handling high data rates with optimized power consumption.
- c. DSP node suitable for baseband processing with lower power consumption. Provision for high performance channelized data flow should be available from/to DSP node.
- d. ADC of min 12-bit resolution with suitable high sampling rate and supported hardware to process fast FH signals.
- e. DAC of min 14-bit resolution with suitable high sampling rate and supported hardware to process fast FH signals.
- f. Provision for monitor/control features like RSSI, AGC.
- g. The system shall be capable of operating at min. 70 MHz Intermediate Frequency (IF) with user programmable option.
- h. Internal Reference Oscillator for programmable sampling clock with connector provision for 10MHz External reference and external sampling clock.
- i. Separate Control bus and high throughput Data paths suitable for low latency operation.
- j. Provision for Audio/ Voice interface available with MIC and Speaker.
- k. LEDs for DSP, GPP and FPGAs shall be available for display.
- l. Interfaces:
  - 10/100/1000Mb Ethernet interface
  - RS-232/422 serial port interface
  - JTAG interface

- High-Speed Data interface for low latency data transfer
  - User I/O GPIO lines between External connector and user programmable FPGA
- m. Cable kit required for integrating various hardware modules and for various available interfaces including RS232, JTAG, LAN, RF, high speed serial & others.
  - n. A development PC/Laptop which can be fully loaded and configured with the software & tools, FPGA tool flow & DSP development environment. This level integration must ensure that everything is functional and allows starting development immediately. There should be scope for carrying out the required aforesaid activities with involvement & presence of user/buyer.
  - o. Antenna Kit covering the RF band of operation.
  - p. Chassis: The hardware/modules should be housed in a single light weight compact air cooled chassis with backplane. The power supply must be available in the chassis and operate at  $230 \pm 10 \text{ V @ } 50 \text{ Hz AC}$  to provide all the required supplies to backplane. All the required interfaces shall be provided on rear or front panels. There should be provision/scope for expansion (addition of modules, custom boards/cards) to augment or enhance the system requirements.

### **3.2 Software:**

A complete package consisting of the following software and tools is required for waveform development on the integrated platform.

- a. POSIX standard Real Time Operating System (RTOS) integrated on to the platform.
- b. Comprehensive Integrated Development Environment (IDE) including debugger, debug server, simulation tools, program builder, editor, run time error checking, analyzer, C/C++ compiler tool chain.
- c. Integrated BSP along with BSP development guide. The board support package shall support the RTOS running on the hardware platform.
- d. Standard API (Application Program Interface) for accelerating user application development.
- e. SCA Core Framework and Software Suite comprising of

- Platform independent Eclipse-based development environment to create, validate, and debug components and applications
  - Component Development Libraries that provide a set of generic functions which simplifies code generation to create SCA components, run-time monitoring tool to install and control applications, as well as visualizing deployment strategies
  - The Core Framework (CF) providing the complete implementation of the responsibilities, services and interfaces as listed in the Software Communications Architecture Specification version 2.2.2 and supports combination of RTOS, Object Request Broker (ORB), and processors that enables the developer to port and test the code developed on one hardware platform onto the other
  - SCA based Radio Manager running on development PC connected through Ethernet enabling the user to install, stop a running and uninstall a waveform.
- f. The platform shall have a Hardware Abstraction Layer (HAL), which allows programs running on the CPU to load, execute and control specialized processing hardware (i.e. FPGAs).
  - g. Software tools / applications supplied should be compatible with SCA compliant Radio Managers (PC based GUI Tools to manage and configure the radio).
  - h. The delivered software shall provide access to source and object code (e.g., file system, applications, BSP, API, remaining code outside kernel).
  - i. All the software and tools shall have perpetual Licenses and licensing terms and conditions shall be provided.
  - j. ORB Express RT for C++ v2.8.1 and latest updates.
  - k. Latest updates for all software tools as applicable.

### **3.2 Other Requirements:**

#### **a) Technical:**

- i. Exhaustive Support for Built-In Test, Diagnostics including loop-back tests and libraries.

- ii. The system should include reusable working system examples (with source code) demonstrating the capabilities and integration of all hardware and software modules.
- iii. Reference example Waveforms (with complete software source and APIs) executable on the platform.
- iv. Support for Model Based Design and interface Libraries for development on FPGA, DSP, and GPP.

**b) Maintenance & Support:**

- i. Warranty - One year free standard warranty from the date of acceptance of all the deliverables at ECIL. The warranty will cover all hardware items against all manufacturing defects and support for software updates, bugs and enhancements.
- ii. Extended warranty & support for 2 years after aforementioned standard warranty of 1 year for all hardware and software items. A description of support level(s), terms, and conditions shall be included in the offer.
- iii. Unlimited Technical support service arrangement consisting of interactive sessions through telephone, email and local authorized support.

**c) Training:**

At least 7 working days training for minimum five persons shall be imparted covering all aspects of system hardware and software with practical hands on exercises. There should be scope for including particular area/subject which is required to be addressed in the training.

**d) Documentation:**

The system shall be delivered with current, up-to-date manuals describing the system, tools, operation and capabilities to readily use and maintain the system. This includes user guides, operational/instruction manuals, technical manuals for hardware and software.

**4. Special Instructions:**

- a. Each requirement shall be addressed in detail for evaluation of the offer. Failure or inadequacy will result in proposal being determined as “non-complied”.

- b. Only a complete integrated working system from a single vendor with sufficient documentation for usage will be accepted.
- c. Detailed data sheets of each hardware/software module/tool should be sent as part of the quotation. Detailed description of platform characteristics and capability to meet the requirements
- d. A detailed document describing the complete workable system architecture consisting of hardware/software elements should be included as part of the proposal. The document shall include description of platform characteristics and capabilities to meet the requirements, inter-element communication mechanisms (e.g. data bus, fabric), software infrastructure, waveform applications, information flow through hardware and software elements/modules.
- e. Preference will be given to a configuration with compact integration of different processing elements to maximize speed, minimize power consumption and enhance resource sharing.
- f. Preference for system with better specifications satisfying the minimum requirements/specs mentioned.
- g. Preference for system architecture which is scalable, flexible and modular based on industry standard (e.g. cPCI), thus allowing for expansion (addition of modules, custom boards/cards) to augment the development platform and enhance the system as requirements or applications.
- h. System demonstration should be given by the Vendor at ECIL within 45 days from the date of opening of Technical Bids.
- i. Chassis assembly and integration shall be by the vendor.
- j. All the requirements as a complete Integrated Package and not as part(s) of the solution should be addressed in the offer.
- k. Offer shall include a cost quotation broken down in sufficient detail to evaluate the proposed cost (e.g., hardware, software, tools and others).
- l. A Techno-Commercial offer in prescribed form shall be submitted in Two Parts -Part-I Technical bid containing technical and commercial details (without prices)  
Part-II Price bid comprises only price details.