

प्रौद्योगिकीस्थानांतरणकेलिएपसंदकीअभिव्यक्ति

**EXPRESSION OF INTEREST for TRANSFER OF TECHNOLOGY**

# "स्मार्टफार्म सिस्टम" कृषि स्वचालन सोलूशयन

**“SMARTFARM System”**

**Agriculture Automation Solution**



प्रगतसंगणनविकासकेंद्र  
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Issued by

**CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING**

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## 1. Introduction

Centre for Development of Advanced Computing (C-DAC) invites “**Expression of Interest**” (EOI) from Indian companies for transfer of technology (ToT) from C-DAC to manufacture, market, sell and deploy **SMARTFARM System**, an Agriculture Automation solution.

This document gives details about

- The product
- The terms and conditions for companies to propose their Expression of Interest and
- How to enter into Transfer of Technology (ToT) agreement based on the terms given herein.

## 2. Brief about C-DAC

Centre for Development of Advanced Computing (C-DAC) is the premier R&D organization of the Ministry of Electronics and Information Technology (MeitY), Govt. of India for carrying out R&D in IT, Electronics and associated areas. It is a national Centre of Excellence, pioneering application-oriented research, design and development in Electronics and Information Technology.

The Centre has contributed significantly to the growth of the industry in general and the electronics sector in particular through the indigenous development of commercially viable systems and products, foreign technology absorption, adaptation and upgrades, consultancy and training and turnkey implementation of contract projects. The Centre has several firsts to its credits and is the recipient of prestigious national level awards for excellence in application- oriented R & D.

The Mission mode programmes of C-DAC include, High performance computing, grid and cloud computing, Multilingual computing & Heritage Computing, Professional Electronics, VLSI and Embedded systems, Software technologies, Cyber Security & Cyber Forensics, Health Informatics, Intelligent Transportation Systems and others.

## 3. Brief description about the technology to be transferred

SMARTFARM System is an indigenously developed farmer-friendly system, developed by C-DAC, Thiruvananthapuram (C-DAC(T)), that helps farmers plan irrigation and fertigation based on environmental and soil conditions ensuring maximum yield. This system monitors different parameters like soil moisture, pH, atmospheric temperature, humidity, wind speed & direction, rain, etc, takes corrective measures and informs the farmer through a graphical display unit. The system is a 100% make-in-India solution, designed and developed for Indian farming scenarios and Indian farmers, highly customisable as per the Indian crops and environmental parameters. The system monitors and controls different farm parameters like soil moisture, pH, atmospheric temperature, humidity etc. It has a wireless interface for collecting data from wireless sensor nodes. Controlling pumps and valves remotely through mobile phones is an added advantage. 4G/5G enabled SMARTFARM system ensures cloud data analytics. The farmers can

configure the device to get alerts of essential field parameters or alarm conditions. The mobile application connected over a high-speed network leverages the farmers to optimally maintain the farm parameters remotely and ensure higher crop yields.

### 3.1. Product Specification and features

#### 3.1.1. Major Features

- ✓ Monitoring and control of various agricultural parameters like temperature, humidity, CO<sub>2</sub>, soil moisture, soil nutrients, Poly house shades, etc., using suitable sensors.
- ✓ Hourly, daily, weekly monthly and yearly planner for irrigation and fertilization
- ✓ Wireless data acquisition through wireless nodes
- ✓ External memory interface for data logging and program feeding.
- ✓ 5" TFT Touch screen display for better farmer assistance
- ✓ SMS messages to the farmers' cell phone for providing situational awareness regarding the agricultural field.
- ✓ Remote control of agricultural field equipments through mobile phones.
- ✓ Cloud interface for futuristic data analytics & inference
- ✓ Input / output Specification
  - i. Analog Input : 12 Nos (4-20mA) / (1-5V)
  - ii. Analog output : 2 Nos (4-20mA / 1-5V)
  - iii. Digital Input : 12 Nos (24V DC/AC , 12 V AC/DC )
  - iv. Digital output : 24 Nos (24V / 12V)
  - v. Wireless Sensors : 20 Nos (Analog / Digital / Serial )
- ✓ User Interface
  - i. Graphical touch screen LCD
  - ii. External memory interface for data logging/program uploading
  - iii. SMS alert on event / daily/weekly basis
- ✓ Time-based / day based /event-based control for pumps and Valves
- ✓ AUTO / MANUAL / TIMER / REMOTE modes of operation
- ✓ PC connectivity for data logging
- ✓ Wireless sensor Interface: Zigbee/LoRa network,
- ✓ Wireless Communication: WiFi, GSM/4G connectivity

#### 3.1.2. SMARTFARM Variants

SMARTFARM\_V2.0 is designed and developed to suits the requirements of small scale to large scale farmers. Hence three different flavours of SMARTFARM\_V2.0 is available.

##### a. SMARTFARM Junior

- 4 Analog Input
- 8 Digital Input/P and 8 Digital Output
- TFT Touch

- SD card & Real Time Clock (RTC)

**b. SMARTFARM Pro**

- 8 Analog Input
- 8 Digital Input and 16 Digital Output
- TFT Touch
- SD card & Real Time Clock (RTC)
- PC interface

**c. SMARTFARM Royal**

- 12 Analog Input & 2 Analog Output
- 12 Digital Input and 24 Digital Output
- TFT Touch
- SD card & Real Time Clock (RTC)
- PC interface
- GSM/4G connectivity / WiFi interface
- Zigbee / LoRa (Wireless Interface for I/O)



Figure 1 : SMARTFARM System

As high-tech farming is gaining importance, there is a broad scope for the developed technology. C-DAC(T) is ready with the technology to empower the life of the farming community of this great nation.






**3.1.3. Use Cases and target application domains**

The key factors which keep the new generations away from cultivation are the monotonous activities of continuous monitoring, watering, and fertilizing, above

all the scarcity of skilled workers, and higher operating costs. In order to avoid this drudgery automation is the simplest solution.

SMARTFARM system is an indigenously developed farmer-friendly system, which helps the farmers to plan irrigation and fertigation based on environmental and soil conditions ensuring maximum yield. The controller is 100% make in India solution, designed and developed for Indian farming scenarios and for Indian farmers, highly customizable as per the Indian crops and environmental parameters. It is equipped with a wireless interface for collecting data from wireless sensor nodes. Controlling pumps and valves remotely through mobile phones is an added advantage. 4G/5G enabled SMARTFARM system ensures cloud data analytics. The mobile application connected over a high-speed network leverages the farmers to optimally maintain the farm parameters remotely and ensured higher yield per crop.

### **Application domains and applications**

-  Precision Farming
-  Agriculture Automation
-  Hydroponics
-  Aquaponics
-  Vertical farming

## **4. Invitation for Expression of Interest**

- 4.1. C-DAC invites “Expression of Interest” (EOI) in the format given in Annexure-1 (Part A& Part B). Companies can become TOT partner of C-DAC based on the information furnished in Annexure – I, subject to the assessment by the C-DAC.
- 4.2. The approved ToT Fees and Royalty Fees are given below.

### 4.2.1. One-time ToT fees

OEM & Others	Rs. 2,50,000.00/-
Start-ups	Rs. 1,00,000.00/-

### 4.2.2. Royalty Fees per module:

OEM & Others	Rs. 2000/- or 5% of the selling price whichever is higher
Start-ups	Rs. 4000/- or 10% of the selling price whichever is higher

- 4.3. This EOI invitation will be open for **Six months** from the date of publication.
- 4.4. Interested companies may submit the expression of interest (see section 5.0 and section 6.0)
- 4.5. The EOI bids received from the vendors shall be evaluated. After the evaluation, if shortlisted, the draft ToT agreement will be shared with the eligible company. If the company agree to the terms and conditions of the agreement, the agreement can be signed after payment of the onetime ToT license fee as stipulated in the payment terms for that product. The company then become eligible for obtaining the knowhow of ‘SMARTFARM system’ for the prescribed period from C-DAC.
- 4.6. Participation in this EOI does not guarantee any association with C-DAC, unless the agreement is signed.
- 4.7. The technology is offered on non-exclusive basis.
- 4.8. The submission of the EOI shall include all such documents that are specified herein to prove the authenticity of their offer and any claim made therein. All cost and expenses associated with submission of EOI shall be borne by the bidder while submitting the EOI and C-DAC shall have no liability, in any manner in this regard, or if it decides to terminate the process of short listing for any reason whatsoever.
- 4.9. C-DAC reserves the right of rejecting any offer without assigning reasons.
- 4.10. There is neither a business guarantee nor any commitment for funding support from C-DAC to the selected ToT partner.

## **5. Who can Apply**

Any Indian Company or Start Ups willing to acquire ToT licenses, manufacture, market, sell and deploy ‘SMARTFARM system’ can apply.

## **6. How to Apply**

Interested companies may send expression of interest by filling the template as per Annexure – I, II, and III along with supporting documents to

### **Section Head, Technology Promotion Centre**

Centre for Development of Advanced Computing (C-DAC)

Vellayambalam, Thiruvananthapuram, Kerala, India, 695033

Phone: 098470 69184/04712723333(450) Fax: 0471 2723456

Email: [tpc@cdac.in](mailto:tpc@cdac.in) Website: [www.cdac.in](http://www.cdac.in)

## **7. ToT Agreement**

- 7.1. The ToT partner is selected based on the expression of interest submitted by interested companies.
- 7.2. If selected, the company shall pay onetime ToT license subscription fee and sign the ToT agreement to become ToT partner of C-DAC.
- 7.3. C-DAC shall sign the technology transfer agreement with the company on receiving the one-time ToT fee.
- 7.4. The license will be granted on Non-Exclusive basis.
- 7.5. Provision for instalment payment for ToT fee shall be given.

- i. The start-up companies can pay the ToT fee in 2 instalments: First instalment of 30% plus applicable taxes shall be paid upon signing the agreement and balance 70% plus applicable taxes should be paid at the time of the handover of ToT deliverables
  - ii. OEMs & other companies can pay the 2 instalments: First instalment of 50% plus applicable taxes shall be paid upon signing the agreement and balance 50% plus applicable taxes should be paid at the time of the handover of ToT deliverables.
- 7.6 However, the ‘SMARTFARM system’ technology shall be transferred only after completing the full ToT payment.
- 7.7 The software product activation license key shall be procured by the company from C-DAC for each unit manufactured and sold to the client on payment of the royalty charges.
- 7.8 No ToT partner will be allowed to quote for ‘SMARTFARM system’ unless he enters into an agreement and pays the ToT fees. The ToT fees are non-refundable. In case any party offer /quotes the rates without an agreement with C-DAC, C-DAC will not honour the rates/ will not give the ToT to such party.

## **8 Validity & Renewal of TOT agreement**

- 8.1 Payment of ToT license fee grants the partner for manufacturing, marketing and selling ‘SMARTFARM system’ for a period of **3 years** from the date of signing of the agreement
- 8.2 For continued support beyond 3 years the partner shall be required to renew the ToT agreement by paying the renewal charges plus applicable taxes before the expiry of valid ToT license, which will be valid for a further extended period of two years.
- 8.3 The renewal charges shall be informed while signing the TOT agreement.
- 8.4 If the renewal is initiated after the stipulated period, a fresh TOT agreement needs to be signed by the company based on the EOI conditions prevailing at that time.
- 8.5 The partner should have a valid ToT subscription license for providing any technical support on the ToT deliverables made by C-DAC.
- 8.6 After five years (from the date of signing the ToT agreement) a new TOT agreement is to be signed by the company based on the EOI conditions prevailing at that time.
- 8.7 Any customisation requirements of the ToT partner shall be entertained by C-DAC only if a valid ToT subscription exists. Such customisations shall be undertaken by C-DAC at cost basis on mutually agreed terms and conditions.

## **9 C-DAC Deliverables**

- 9.1 On payment of onetime license fee and signing of ToT agreement, the following items shall be provided by C-DAC to the TOT partner for production, product marketing support and PoC demonstration.

The deliverables will be

- i. ToT Partnership certificate
- ii. Product data sheet file in PSD/pdf format



- iii. Technical Manual
- iv. User Manual
- v. Troubleshooting Manual
- vi. One unit of SMARTFARM 'Royal' demonstration module at the cost of Rs. 50,000.00/-
- vii. Bill of Materials
- viii. Sourcing details
- ix. Schematic and PCB design with Gerber files
- x. Mechanical drawings
- xi. Test Plan and Procedure
- xii. Firmware fusion Software with binary(\*.hex') file

## **10 Training for TOT Partners**

- 10.1 C-DAC shall arrange the following training for the TOT partner at C-DAC(T), for which the travel, boarding, and lodging expenses of the trainee(s) during the period of training shall be borne by the ToT partner
- 10.2 Upon 100% payment of one time ToT subscription license fee detailed production level training and on application development of SMARTFARM system shall be provided up to three working days.
- 10.3 The training will be conducted at C-DAC(T) premises.
- 10.4 The travel and boarding and lodging expenses of the trainee(s) during the period of training shall be borne by the ToT partner.
- 10.5 Additional training at the premises of ToT Partner or at the client location shall be done on payment basis. For training requested outside C-DAC(T) premises, air travel, boarding and lodging charges of C-DAC trainers shall be borne by the ToT partner. C-DAC will charge manpower as per C-DAC rules prevailing at the time of training for outstation training. For such outstation trainings nomination of trainers and period of stay at the designated training location will be decided by C-DAC(T) on mutual consultation, depending on the type of training requested.
- 10.6 Additional training may also be given by C-DAC either at the premises of C-DAC(T) or at the location identified by the ToT partner on payment basis at mutually agreed terms and conditions.

## **11 Field implementation support**

- 11.1 C-DAC(T) shall provide remote support to the ToT partner for installation and configuration of SMARTFARM system during the license period on case-to-case basis upon mutually agreed terms and conditions.
- 11.2 If any onsite support is requested by the ToT partner, C-DAC shall support on mutually agreed terms and conditions.

11.3 For onsite support outside C-DAC premises travel, boarding and lodging charges of C-DAC(T) officials shall be borne by the ToT partner. C-DAC shall also charge manpower as per C-DAC rules prevailing at the time of support request for outstation support. Size of the C-DAC(T) team and period of stay for outstation support shall be decided by C-DAC(T) on mutual consultation, depending on the type of support requested.

## **12 Direct deployment by C-DAC**

12.1 C-DAC reserves the right to deploy SMARTFARM system solution directly to customers on orders for implementation awarded directly by the end user.

12.2 If C-DAC is deploying SMARTFARM system directly, then the cost at which C-DAC will be offering the solution to the end user will be **Rs.45,000.00** and **Rs.50,000.00**, for govt and private clients respectively. The prices indicated are excluding of taxes and is valid of a period of 1 year. This cost includes only the cost of basic system and does not include installation, deployment, training, support etc.

## **13 Maximum List Price /GeM Price**

13.1 The Maximum List Price/GeM price of SMARTFARM system listed in GEM, by C-DAC shall be **Rs. 50,000.00**, excluding tax. This cost includes only the cost of basic system and does not include installation, deployment, training, support etc. However, the TOT partner can fix their selling price.

### **For any queries please contact:**

Section Head (Technology Promotion Centre)  
Vellayambalam, C-DAC, Thiruvananthapuram  
Contact: 098470 69184/04712723333(450),  
email: [tpc@cdac.in](mailto:tpc@cdac.in)

## Annexure –I (Part-A)

### Company Profile of the bidder (In Company Letter head)

A.	Company Profile
1.	Name of the Organization: Website:
2.	Name of the Contact Person: Address: Mobile: Landline: Fax: E-Mail:
3.	Year of Incorporation:
4.	Type of Organization a. Public Sector/ Limited/Private Limited/ Partnership/Proprietary/ Society/ Any other b. Whether 'Foreign Equity Participation (Please give name of foreign equity participant and percentage thereof) c. Names of Directors of the Board/ Proprietors d. Name and address of NRI(s), if any
5.	Category of the firm: Large/Medium/Small scale unit / Others
6.	Address of the Registered Office: (Include Certificate of Registration)
7.	Number of Offices with addresses (Excluding Registered Office): India, ..... Abroad:.....
8.	Certificate of registration as a manufacturing unit
9.	Permanent Account Number
10.	GST Reg. No.
11.	ISO or any equivalent Certification

## Annexure – I ( Part B)

### Technical Collaborations of the bidder

<b>B.</b>	<b>ESSENTIAL REQUIREMENTS</b>
1.	The organization must be a reputed firm/company/SME/startup/R&D company incorporated in India.
2.	The turnover is to be supported by financial statements of accounts/ Annual reports duly certified by a Chartered accountant/ Balancesheets of last 3 years/ Income tax returns for the last 3 years period.
3.	Company profile, giving details of current activities and management/ personnel structure including evidence of incorporation. The company should be registered and ISO orequivalent certified.
4.	Details of absorption of technology for a product/knowhow that has been taken up on production scale in the past may also be given
5.	The manpower strength (Technical:Mechanical, Electrical, Electronics, Software & Non-Technical etc.) at various levels to be furnished Technical: a. B.E./ B.Tech / M.Tech / PhD b. DIPLOMA c. SKILLED TECHNICIANS d. UNSKILLED
6.	The list of machine tools /equipment/software/facilities available related with work to be furnished.
7.	The in-house technological expertise available to be furnished
8.	The list of equipment available for inspection and quality control to be furnished.
9.	The industry should have adequate space for undertaking this work. Available space - Covered & Open and location details to be furnished.
10.	List of products/technologies worked with as regular activity in last three years. Give the list of products/technologies with general specifications and the customers.
11.	List of PSUs/Govt..customers – with contact details (Address,Telephone no., Contact Person)
12.	The details of sales, marketing and maintenance network to be furnished
13.	The list of technical collaborators for various ongoing products may be furnished
14.	The bidder shall provide details of the sub-vendors in case they propose to employ for Part-work.
<b>C.</b>	<b>Expression of Interest: Spell out the extent of interest and envisaged market potential</b>

I hereby declare that the above information is true to the best of my knowledge.

Signature with Name & Seal:

Place:

Date:



# SMARTFARM SYSTEM

SMARTFARM system is an indigenously developed farmer friendly system, which helps the farmers to plan irrigation and fertigation based on environmental and soil conditions, ensuring maximum yield. The controller is 100% make in India solution, designed and developed for Indian farming scenarios and for Indian farmers, highly customizable as per the Indian crops and environmental conditions. It is equipped with wireless interface for collecting data from wireless sensor nodes. The farmers receives SMS alerts for farm situation awareness. 4G/5G enabled SMARTFARM system ensures cloud data analytics. Controlling of pumps and valves remotely through mobile phone is an added advantage. The mobile application connected over high speed network leverages the farmers to optimally maintain the farm parameters remotely and ensures higher yield per crop.

## Features

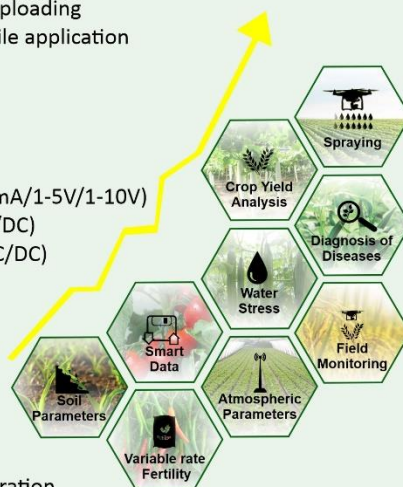
- ✓ Auto/Manual/Remote modes of operation
- ✓ Hourly, daily, weekly, monthly and yearly planner for irrigation and fertigation
- ✓ On-board system configurator
- ✓ External memory interface for data logging and Schedule uploading
- ✓ Remote control of agricultural field equipments using mobile application
- ✓ Wireless data acquisition through wireless sensor nodes
- ✓ 4G/5G interface for cloud data processing

## Field Sensor Interface

- ✓ Sensor (humidity, moisture etc) : 12Nos (04-20mA/1-5V/1-10V)
- ✓ ON/OFF digital input signals : 8Nos (12V AC/DC)
- ✓ Control output : 24Nos (12V AC/DC)
- ✓ Wireless Sensor Interface : 20Nos

## User Interface

- ✓ 5" TFT graphical touch screen
- ✓ SMS alert on event/daily/weekly basis
- ✓ Alarms for abnormal conditions
- ✓ Mobile Application interface for monitoring and control
- ✓ PC based software interface for data logging & report generation



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