



# **NGT-Farm**

## **Next Generation Tec Farm**





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# Introduction

- Tiroj Nirooye Gharb (NGT) is a leading company specializing in smart SCADA in oil and water, smart agriculture, and IoT systems, which was Established in 1400.
- The company has developed various products in the field of IoT, with a focus on SCADA for oil, smart agriculture, and monitoring telecommunications sites and batteries. It has also provided security solutions for large farms, including agricultural lands, greenhouses, and livestock farms.
- Recently, NGT obtained permission to operate in the oil park, showcasing its potential in smart SCADA and IoT systems.
- The company has also developed a smart IoT platform for smart farms, greenhouses, and livestock systems. With a focus on innovation and excellence, NGT aims to provide cutting-edge technology and solutions to its clients.

# Activities

- Smart Agriculture
- Smart Greenhouse
- Smart Livestock
- Smart SCADA
- Smart IoT Systems

## Smart Agriculture

By the report submitted by Forbes, till 2050 population of the world will be more than 9.6 billion consequently leading to %70 increase in food consumption. Since there is limited farm land the only way to overcome this crisis is to plan smartly: change in the agriculture pattern. With the growing adoption of the Internet of Things (IoT), connected devices have penetrated every aspect of our life, from health and fitness, home automation, automotive and logistics, to smart cities and industrial IoT.

Thus, it is only logical that IoT, connected devices, and automation would find its application in agriculture, and as such, tremendously improve nearly every facet of it.

Farming has seen a number of technological transformations in the last decades, becoming more industrialized and technology-driven. By using various smart agriculture gadgets, farmers have gained better control over the process of raising livestock and growing crops, making it more predictable and improving its efficiency. The technologies driving the 'smart farming revolution' include the Internet of Things (IoT), edge computing, 5G, block chain, Artificial Intelligence (AI), machine learning, robotics and drones.



Tiroj Nirooye Gharb (NGT) has designed, implemented & developed its Smart Agriculture Platform called “NGT Farm” based on its valuable experience in ICT & Industrial Automation projects by a young motivated start up team.

“NGT Farm” platform currently includes four smart modules:

- Smart Farm
- Smart Greenhouse
- Smart Livestock
- Smart Security of large-scale farms

Trend technologies such as cloud computing, edge computing, machine learning, MQTT & LoRa protocols, and big data are used in developing “NGT Farm”, also it can be customized according to the customer requirements.



## Smart Farm Module Features

- Smart Irrigation
- Smart Nutrition
- Diagnosis of pests & diseases
- Warning of the spread of pest attacks
- Planning & Management
- Failure detection in devices





# Smart Farm Module Features

The screenshot displays a dark-themed dashboard for a smart farm module. On the left is a vertical navigation menu with the following items: Dashboard (with an upward arrow), ControlTools, Report, ToolsManagement, Alarms, UserManagement, Irrigation, and Setting. The main content area is divided into several sections:

- Top Section:** A header image of green leaves with water droplets. Below it, a 'valves situation' icon is shown.
- Weather Info Section:** A grid of weather-related data points:
  - temp: 20 degrees
  - WindSpeed: 26km/s
  - Wind Direction: TQ
  - Humidity: 20 %
  - Rainfall: 0-
  - Rain Detection: Rainy
- Sensor Info Section:** Two vertical sliders for 'temp sensor' (TA) and 'Humidity Sensor' (Y-).
- Irrigation Section:** A 'Flometer' gauge showing a value of 10.0.
- Control Elements:** A 'Pump Situation' icon, an 'Alert Situation' icon with a red circle, and an 'Irrigation Situation' toggle switch.

# Smart Farm Module Features



# Smart Agriculture Service



## IoT(Irancell):

MQTT protocol used for communication



## Cloud(Irancell):

Cloud Computing used for processing



## Smart Irrigation:

Electric valves control can start irrigation



## Temperature and Humidity:

Monitoring temperature and humidity



## Pump:

Pump for irrigation and feeding



## Water Level:

Monitoring water level on tankers



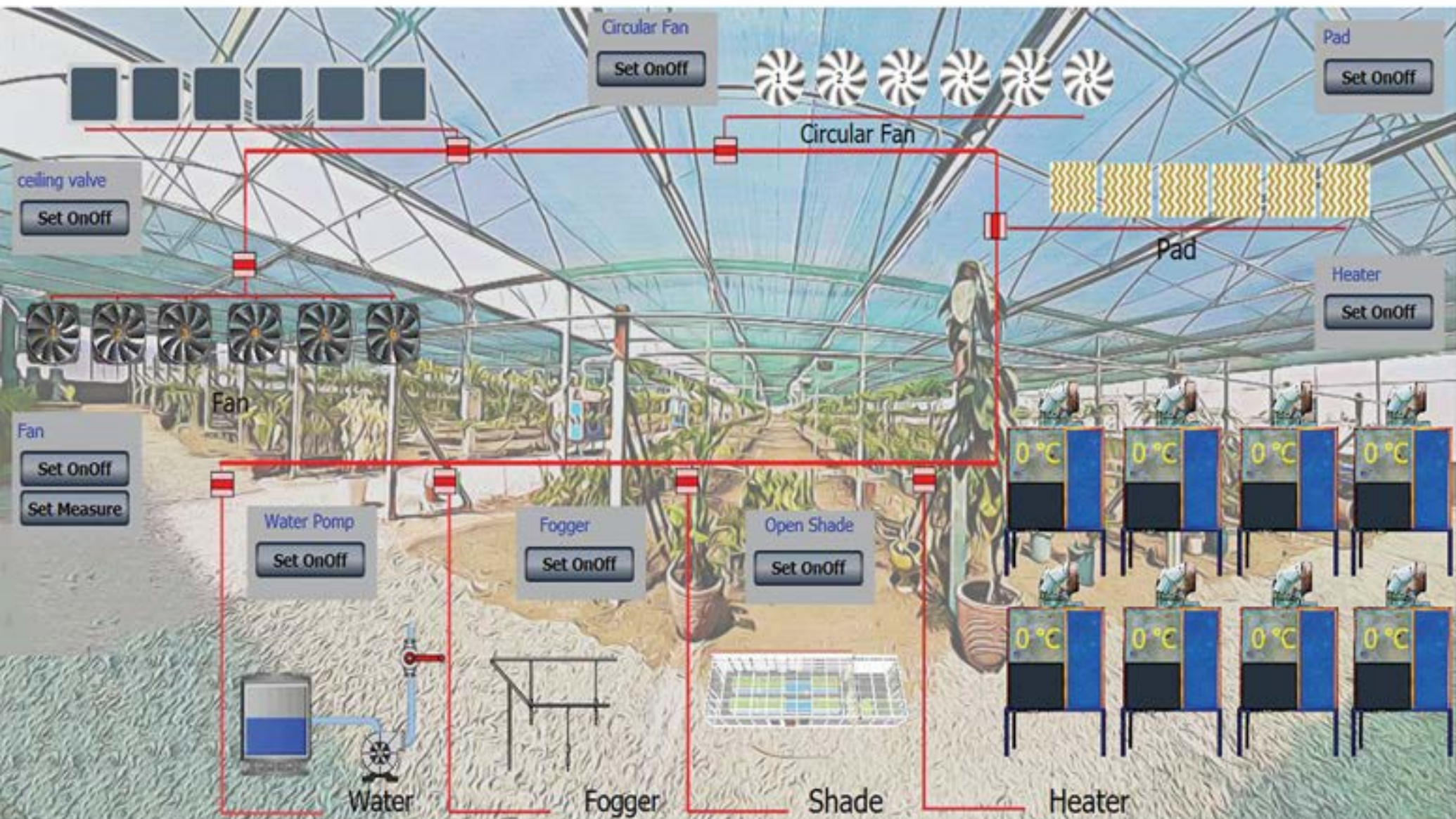
## Smart Greenhouse Module Features

- Smart Climate Control
- Smart Irrigation
- Smart Nutrition
- Diagnosis of Pests & Diseases
- Planning & Management
- Failure detection in devices





# Smart Greenhouse Module Features





# Smart Greenhouse Module Features

The dashboard, titled "NGT Climate Manager", displays a variety of environmental and system metrics. At the top, there are weather icons (sun, sun with cloud, sun with rain, snow, lightning, and rain) and a user status bar showing "current user : User1". A sidebar on the left contains navigation options: Home, Actuator, Log, Chart, Alarm, Settings, Camera, and Log Out. The main area is divided into several panels:

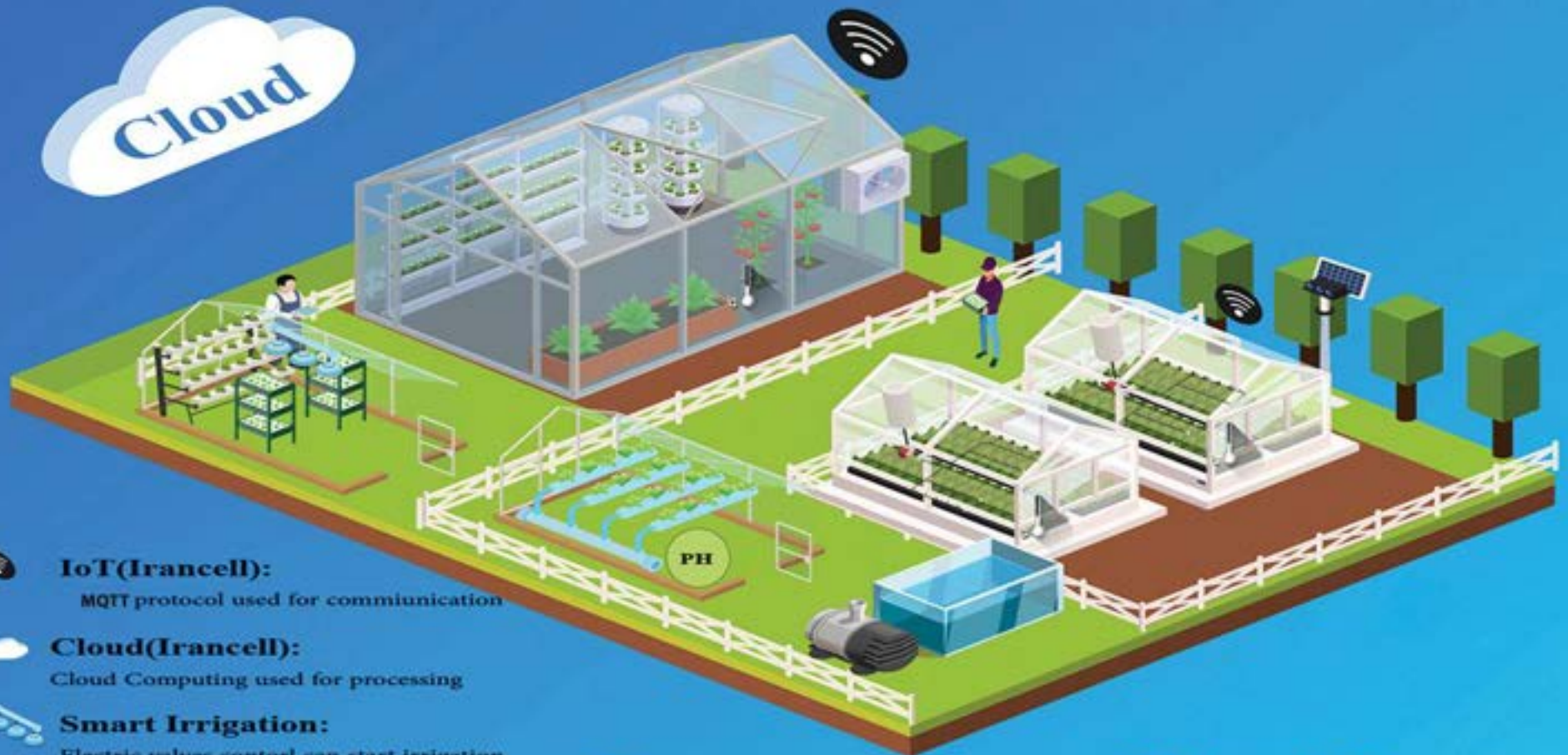
- Date and Time:** 11/3/2019, 2:32:16 PM
- Outside Temperature:** 21 °C (with a gauge)
- Inside Light:** 3500 LUX (with a sun icon)
- Outside Humidity:** 39 % (with a gauge)
- Inside Temperature:** 21 °C (with a gauge)
- Inside CO2:** 425 PPM (with a CO2 icon)
- inside Humidity:** 72 % (with a gauge)
- Heater Temperature:** 18 °C (with a gauge)
- Hot water Temperature:** 0 °C (with a gauge)
- Soil Humidity:** Tree: 29 %, Graps: 56 %, Tomato: 30 % (with a gauge)

At the bottom, there are two summary statistics:

- Count of power off: 0
- Time of machine work: 0



# Smart Greenhouse Module Features



## IoT(Irancell):

MQTT protocol used for communication



## Cloud(Irancell):

Cloud Computing used for processing



## Smart Irrigation:

Electric valves control can start irrigation



## Temperature and Humidity:

Monitoring temperature and humidity



## Pump:

Pump for irrigation and feeding



## Water Level:

Monitoring water level on tankers



## PH Level:

Monitoring PH of soil



## Control of Temperature:

Control of temperature with fans

## Smart Livestock Module Features

- Livestock Status Monitoring
- Abnormal Livestock Alert
- Diagnosis of Livestock Diseases
- Warning of infectious veterinary diseases
- Planning & Management
- Failure Detection in Devices





# Smart Livestock Module Features



**IoT(Irancell):**

MQTT protocol used for communication



**Cloud(Irancell):**

Cloud Computing used for processing



**Smart Gate:**

The smart gate is used to monitor weight, vaccination status and number of livestock



## Smart Security Module Features

- Video Surveillance
- Unauthorized Entry Alert
- Record the Entry and Exit of Employees



# NGT Farm Advantages

- Constant monitoring of soil, water and crop conditions
- Reducing wastage and consumption of water and energy
- Integrated management of production units
- Saving costs and reducing the cost of products
- Facilitating and improving management activities
- Facilitating knowledge management
- Compatibility with the environment, preservation of basic resources & more sustainable production
- Reduce human errors

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