

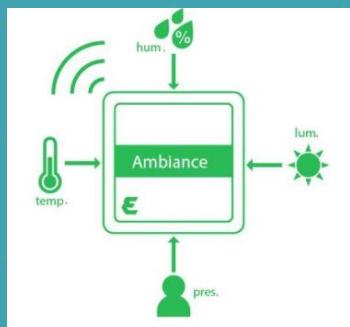


Smart Greenhouse with IoT-Based Light and Heat Control



Requirement

The project aims to design and implement an IoT system for the control, supervision, and utilization of data from connected sensors, in order to monitor and optimize the operation of an environment or equipment



Project Requirements

The project aims to develop a connected IoT system that monitors ambient light and adjusts a resistive heating source to simulate solar energy. The system incorporates a temperature sensor for heat regulation and frost protection, as well as a humidity sensor to control the environment through ventilation. A local display shows system status and faults, which can be acknowledged via a push button. Remote supervision software enables real-time monitoring, control, and visualization of data, including historical trends and the weather for the next seven days. Since the system is solar-powered in 12volts , it is essential to take actions to minimize energy consumption.

High Level Milestones

IOT Core

- **System Architecture and Design** – Define hardware and software structure, IoT Core.
- **Development of Core Modules** – Implement sensor reading, heating and humidity control, display, and IoT connectivity.
- **Prototype Assembly and Integration** – Assemble hardware, integrate modules, enable basic remote supervision.
- **System Testing and Validation** – End to End tests, safety, and full supervision capabilities.
- **Final Delivery and Documentation** – Complete documentation, finalize Core documentation, and deliver the working system. (With or without supervision)

High Level Milestones

IOT Supervision

- **Architecture and Design** – Define hardware and software structure, supervision interface.
- **IoT connectivity Development** – Implement data transmission from the greenhouse system to the cloud or remote platform.
- **Remote Interface & Visualization** – Provide real-time monitoring and data visualization for users.
- **Testing and Validation** – Ensure supervision system functions reliably and securely
- **Final Delivery and Documentation** – Complete documentation, finalize remote supervision, and deliver the working system.



Prototype technical characteristics:

The prototype includes :

- Three status indicators (red, orange, and green LEDs) Power 5 Volts.
Signal **3.3 Volts**.
- Temperature sensor Analog Output
- Fan 12 volts 0.45 Watt
- Heating element 10 ohms **25 Watts** without its power supply unit.
- Potentiometer for manual setting the temperature setpoint. Analog Output

Setpoint temperature:

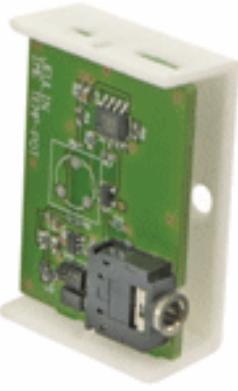
15 °C to 30 °C

Operating temperature range:

0 °C to 50 °C

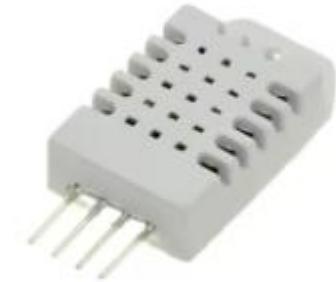
Prototype





Temperature Sensor

- **Type:** Analog sensor
- **Function:** Measures temperature in the range **0 to 40 °C**
- **Output:** Analog voltage of **10 mV/°C**, proportional to the temperature
- **Accuracy:** $\pm 2\%$
- **Voltage range:**
 - **0 °C = 0 V**
 - **40 °C = 4 V**
- **Connector:** 3.5 mm female jack



AM2302 Sensor

1. **Operating voltage:** 3 V to 5.5 V
2. **Sensor model:** AM2302 temperature and humidity sensor
3. **Signal output type:** Digital signal
4. **Temperature measurement range:** -40 °C to +80 °C
5. **Temperature accuracy:** $\pm 0.5\text{ }^{\circ}\text{C}$
6. **Humidity measurement range:** 0 to 100 % RH
7. **Humidity accuracy:** $\pm 2\text{ \% RH}$
8. **Resolution:** 16-bit

Prototype

① : VDD	(Power supply 3.5V~5.5VDC)
② : SDA	(Serial data bidirectional port)
③ : NC	(empty foot)
④ : GND	(Ground negative pole)



Potentiometer

- **Type:** Analog sensor
- **Function:** Used as a rheostat (variable resistance)
- **Output:** Analog voltage ranging from **0 to 4 V**, depending on the potentiometer position
- **Connector:** **3.5 mm female jack**



LEDs Light

- **Type:** Digital actuator
- **Function:** Used to implement states system
- **Logical state for each LED (Green, Amber, Red):**
 - **0** = Light off
 - **1** = Light on
- **Connector:** **2.5 mm female jack**

Prototype

Sensors Integration Tasks

- Sensors evaluation study.
- Integrate sensors to measure ambient light, temperature, and relative humidity.
- Calibrate sensors to ensure accurate and reliable readings.
- Acquire real-time data for use in local and remote control systems.

Controls & Regulation Tasks

- MCU evaluation study.
- Implement heating control based on ambient light levels to simulate sunlight.
- Include temperature regulation and frost protection to ensure safe operation.
- Integrate humidity control via ventilation to maintain optimal greenhouse conditions.
- Include defaults list with acknowledgment level.

Display monitoring

- Display evaluation study.
- Develop a display module to show the system status and fault notifications.
- Implement a pushbutton to reset alerts and change operating mode locally.

MAIN LOCAL TASKS

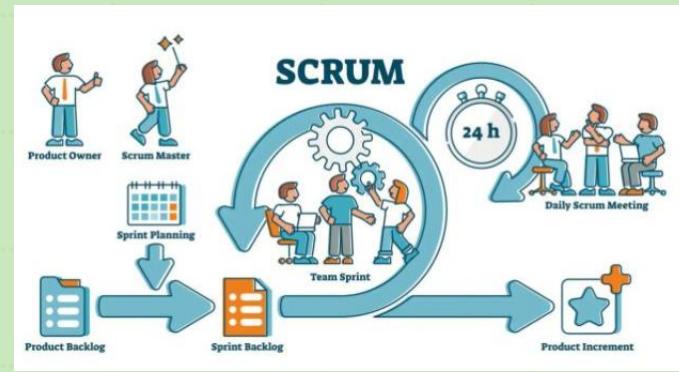
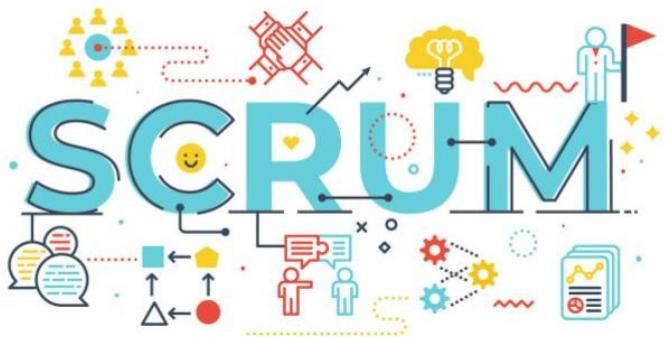
IoT platform

- Architecture platform study including networks
- Implement historical data storage and display of trends for analysis.
- Provide remote control capabilities, including activation or adjustment of heating and ventilation.
- Ensure alerts and faults are visible and actionable remotely.

Documentation and Delivery

- Prepare technical documentation, including schematics, calibration procedures, and user manuals.
- Provide a final report and presentation summarizing system design, functionality, and test results.
- Deliver a fully operational IoT greenhouse prototype with both local and remote supervision capabilities.

MAIN REMOTE SUPERVISION TASKS



Here are **SCRUM best practices** that actually improve teamwork, not just “follow-the-rules Scrum.” I’ll group them by what makes teams succeed in real life.

Get the fundamentals right (or nothing else works)

❖ Clear roles

- **Product Owner** owns what and why (value, priorities).
- **Scrum Master** owns how (process, flow, removing blockers).
- **Developers** own how to build and how much they can commit.

👉 Avoid role overlap that creates confusion or silent power struggles.

❖ A strong Definition of Done (DoD)

- Done means *shippable, tested, documented if needed*.
- A weak DoD destroys trust inside the team.





open-source project management tool

For cross-functional agile teams to work effectively

The screenshot shows the Taiga web application interface. At the top, there's a navigation bar with icons for search, help, notifications, and user profile. Below the header, a sidebar on the left lists project management options: Connected GreenHouse (selected), Scrum, Issues, Search, Wiki, Team, and Settings. The main content area displays the "Connected GreenHouse" project details. It includes a thumbnail image, the project name, a description ("Polytech 45 - EMINEM/MARS IoT Project 2026"), and social sharing metrics: 0 likes, 1 person watching, and a message icon. A recent activity feed shows a post from "remybeaudenon" about creating the project, posted 8 minutes ago. On the right side, there's a "Team" section with a user icon.

<https://tree.taiga.io/project/remybeaudenon-connected-greenhouse/>

THANKS !

Nom du présentateur

E-mail

Site web





Nom
Titre



Nom
Titre



Nom
Titre



Nom
Fonction

Équipe

La meilleure manière de se lancer, c'est d'arrêter de parler, puis de commencer à agir.

Walt Disney

Titre

Pour commencer une présentation, accédez à l'onglet Diaporama et sélectionnez À partir du début.

Titre

Pour afficher le mode Présentateur, en mode Diaporama, sur la barre de contrôle en bas à gauche, sélectionnez les points de suspension, puis Mode Présentateur.

Titre

Pendant votre présentation, les notes du présentateur sont visibles sur votre écran, mais ne sont pas visibles pour l'auditoire.

Titre

Le volet de notes est une zone qui apparaît en dessous de chaque diapositive. Appuyez dessus pour ajouter des notes.

Titre

Si le volet de notes n'apparaît pas ou s'il est complètement réduit, cliquez sur Notes dans la barre des tâches au bas de la fenêtre PowerPoint.

Chronologie

Contenu

Sous-titre

1. Ajoutez du texte, des images, des dessins et des vidéos.
2. Ajoutez des transitions, des animations et des mouvements.
3. Enregistrez sur OneDrive pour accéder à vos présentations depuis votre ordinateur, depuis votre tablette ou depuis votre téléphone.

Sous-titre

1. Ouvrez le volet Idées de conception pour transformer instantanément vos diapositives.
2. Lorsque nous avons des idées de conception, c'est ici que nous vous les présentons.

Sous-titre

1. Ce thème PowerPoint utilise sa propre série de couleurs, de polices et d'effets pour créer l'apparence générale de ces diapositives.
2. PowerPoint inclut de nombreux thèmes pour donner à votre présentation la personnalité qui convient.

Résumé

Avec PowerPoint, vous pouvez créer des présentations, puis partager votre travail avec d'autres personnes, où qu'elles soient. Tapez ici le texte souhaité pour commencer. Vous pouvez également ajouter des images, des dessins et des vidéos sur ce modèle. Enregistrez sur OneDrive, puis accédez à vos présentations depuis votre ordinateur, depuis votre tablette ou depuis votre téléphone.

