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(57) Abstract :
ABSTRACT The present disclosure introduces a smart hydroponic kit for sustainable hydroponic farming 100 enabling precise real-time monitoring and control of environmental and nutrient conditions. The system is powered by an ESP32 102 microcontroller and includes a pH sensor 104, TDS/EC Sensor 106, and temperature and humidity sensor DHT11 108 for measuring key parameters such as acidity, nutrient concentration, temperature, and humidity. A 3s battery and BMS 110 with a bulk converter 112 ensures stable power supply, while the power supply 114 offers external recharging capabilities. The kit integrates a user system 116 and a mobile application 118 for user-friendly interaction, along with a database 120, local server 122, and cloud server 124 for data storage and remote access. The data is processed and visualized facilitating informed decision-making and enhancing crop yield efficiency. Reference Fig 2

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