

# Hydroponics Monitoring and Control System

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**Abstract:** *This paper presents the design and construction of a hydroponics monitoring system that can collect parameters of hydroponic systems, such as temperature, water limit, pH level, and nutrient levels. The monitoring system was developed using an ESP32 microcontroller and several sensors, including total dissolved solids (TDS), pH, water level, and temperature sensors. The ESP32 microcontroller gathers and processes data from the sensors to automatically activate the water or salt pump and drain the necessary materials into the hydroponic system's plant basin. The user can then view the hydroponic parameters through the Blynk application on a smart phone. The user can also activate the pumps for water, nutrients, or salt using the application's interface on a smart phone, or the ESP32 microcontroller can activate them automatically if the parameter values deviate from the required values.*

**Keywords:** hydroponics monitoring

## REFERENCES

- [1]. L. Cifuentes-Torres, LG. Mendoza-Espinosa, G. Correa-Reyes, L.W. Daesslé Hydroponics with wastewater: a review of trends and opportunities Water Environ. J., 35 (1) (2021),pp.166-180
- [2]. N. Sharma, S. Acharya, K. Kumar, N. Singh, O.P. Chaurasia Hydroponics as an advanced technique for vegetable production: an overview J. Soil Water Conserv., 17 (4) (2018),pp. 364-371
- [3]. D.J. Singh, J. Davidson Introduction to Hydroponics-Growing Your Plants Without Any Soil
- [4]. Mendon Cottage Books (2016)
- A. Abu Sneineh, WA. Salah Design and implementation of an automatically aligned solar tracking system Int. J. Power Electr. Drive Syst., 10 (4) (2019), p. 2055
- [5]. Abu Sneineh, WA. Salah Palestine automotive license identity recognition for intelligent parking system J. Eng. Sci. Technol., 12 (5) (2017), pp. 1216-1226
- [6]. DS. Domingues, HW. Takahashi, C.A.P. Camara, SL. Nixdorf Automated system developed to control pH and concentration of nutrient solution evaluated in hydroponic lettuce production Comput. Electron. Agric., 84 (2012), pp. 53-61
- [7]. F. Kalantari, O.M. Tahir, A.M. Lahijani, S. Kalantari A review of vertical farming technology: a guide for implementation of building integrated agriculture in cities Adv. Eng. Forum, 24 (2017), pp. 76-91
- [8]. R. Pandey, V. Jain, K.P. Singh Hydroponics Agriculture: Its status, Scope and Limitations, 20,
- [9]. Division of Plant Physiology, Indian Agricultural Research Institute, New Delhi (2009) [9]C. Treftz, ST. Omaye Hydroponics: potential for augmenting sustainable food production in nonarable regions Nutr. Food Sci., 46 (5) (2016), pp. 672-684
- [10]. Z. Zuriati, M. Apriyani, A.R. Supriyatna Design and implementation automation system for hydroponic vegetable cultivation Proceedings of the International Conference on Agriculture and Applied Science (2021)
- [11]. K. Kularbphetpong, U. Ampant, N. Kongroj An automated hydroponics system based on mobile application Int. J. Inf. Educ. Technol., 9 (8) (2019), pp. 548-552
- [12]. S. Huo, J. Liu, M. Addy, P. Chen, D. Necas, P. Cheng, K. Li, H. Chai, Y. Liu, R. Ruan . The influence of microalgae on vegetable production and nutrient removal in greenhouse hydroponics
- [13]. J. Clean. Prod., 243 (2020), Article 118563
- [14]. JCV. Puno, JJI. Haban, JD. Alejandrino, AA. Bandala, EP. Dadios Design of a nutrient film technique hydroponics system with fuzzy logic control Proceedings of the IEEE Region 10

- [15]. Conference (Tencon), IEEE (2020), pp. 403-408
- [16]. Ramos, L. Nóbrega, K. Baras, L. Gomes Experimental NFT hydroponics system with lower energy consumption Proceedings of the 5th Experiment International Conference
- [17]. (exp. at'19), IEEE (2019), pp. 102-106
- [18]. Datasheet, Gravity: analog TDS sensor /meter for arduino SKU: SEN0244. (20/6/2022). <https://media.digikey.com>