

# DEVELOPMENT OF PHOTODIODE SENSOR

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FAKULTI SAINS DAN TEKNOLOGI  
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# DEVELOPMENT OF RAIN INTENSITY SENSOR

By  
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DEPARTMENT OF PHYSICAL SCIENCES  
FACULTY OF SCIENCE AND TECHNOLOGY  
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**PENGAKUAN DAN PENGESAHAN LAPORAN PENYELIDIKAN  
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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **Development of Rain Intensity Sensor** oleh **Dwight Tham Jern Ee** no. matrik: **UK13114** telah diperiksa dan semua pembedaan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Fizik sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains Gunaan (Fizik Elektronik & Instrumentasi), Fakulti Sains dan Teknologi, UMT.


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## DECLARATION

I hereby declare that this thesis entitled Development of Rain Intensity Sensor is the results of my own research except as cited in the reference.

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## DEVELOPMENT OF RAIN INTENSITY SENSOR

### ABSTRACT

Rain intensity is one of the important parameter for the meteorological field. Currently, the sensor that commonly used is the Pluviograph Dines Tilting-Siphon. Pluviograph is capable to record the rain intensity and also the amount of rain. The problem of this sensor is during the siphon process the amount and intensity of rain is not measured. Besides, the sensor did not give real time reading and it is a conventional sensor that output is not in electrical to obtain the advantages of modern computing and display devices. In this paper, a rain intensity sensor with remote monitoring system is designed, fabricated and calibrated. The objective for designing this sensor is to give real time reading and make the output of the sensor in electrical signal. This sensor used the kinetic of rain water to measure the rain intensity because the kinetic of rain is analogous with rain intensity. The design sensor used a water wheel as a transducer to convert the kinetic of water into voltage. Then the voltage is converted to frequency so that it is easy to interfere with the electronic monitoring devices such like computer or oscilloscope. The designed sensor is successfully developed and it is able to give real time reading with the sensitivity of  $2.3489 \text{ Hz/ ml s}^{-1}$ .

## PEMBANGUNAN PENGESAN KELEBATAN HUJAN

### ABSTRAK

Kelebatan hujan merupakan salah satu daripada parameter yang penting dalam bidang kajicuaca. Kini, pengesan yang biasanya digunakan adalah Pluviograph Dines Tilting-Siphon. Pluviograf boleh merakam kelebatan hujan dan juga jumlah isipadu air hujan. Masalah Pluviograf ini adalah semasa proses sifon, isipadu hujan dan keamatan hujan tidak dapat diukur. Selain itu, ia juga tidak dapat memberikan bacaan masa sebenar dan ia adalah sejenis sensor yang konvensional, dimana hasil keluarannya bukan dalam elektrik untuk mendapatkan kelebihan pengkomputeran moden dan alat-alat paparan. Dalam tesis ini, satu pengesan kelebatan hujan dengan sistem pemantauan jarak jauh telah direkabentuk, dibina dan ditentukur. Objektif pengesan rekaan ini adalah untuk memberikan bacaan masa sebenar dan hasil keluaran bagi pengesan adalah dalam isyarat elektrik. Pengesan ini menggunakan kinetik air hujan untuk mengukur kelebatan hujan kerana kinetik hujan adalah berkadar langsung dengan keamatan hujan. Pengesan kelebatan hujan yang direka ini menggunakan roda air sebagai satu transduser untuk menukar kinetik air kepada voltan. Kemudian voltan itu ditukar kepada frekuensi supaya ia adalah sesuai and mudah apabila diaplikasi dengan peranti-peranti pemantauan elektronik seperti komputer ataupun osiloskop. Pengesan kelebatan hujan ini telah berjaya dihasilkan dan mempunyai ciri-ciri seperti berupaya memberi bacaan masa sebenar dengan kepekaan  $2.3489 \text{ Hz/ ml s}^{-1}$ .