

LEMBAR PENGESAHAN

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ICNERE EECCIS 2016

Joint International Conference 3rd ICNERE and 8th EECCIS

The 3rd International Conference on Nano Electronics Research and Education

The 8th International Conference on Electrical, Electronics, Communications, Controls and Informatics System

October 31 – November 2, 2016
Batu, Indonesia

PROCEEDING



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Proceeding

Joint International Conference 3rd ICNERE and 8th EECCIS

The 3rd International Conference on Nano Electronics Research and Education
The 8th International Conference on Electrical, Electronics, Communications, Controls and
Informatics System
October 31 –November 2, 2016
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Joint International Conference:

The 3rd International Conference on Nano Electronics Research and Education
(ICNERE 2016)

The 8th International Conference on Electrical, Electronics, Communications, Controls and Informatics
System
(EECCIS 2016)

"Green Technology towards a Better Environment"

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ABOUT THE CONFERENCE

Universitas Indonesia, Shizuoka University, Universitas Brawijaya and Universiti Tun Hussein Onn Malaysia (UTHM) are collaborating to organize and pleased to announce the joint International Conference of the 3rd International Conference on Nano Electronics Research Education 2016 (ICNERE 2016) and 8th International Conference on Electrical Power, Electronics, Communications, Controls and Informatics System 2016 (EECCIS 2016). The first ICNERE were held in Bali, Indonesia in 2012 and the 2nd ICNERE were held in Hamamatsu, Japan in 2014. EECCIS is a biannually conference held since 2000 until 2014. The conference will be held in Malang, a second largest city in East Java Indonesia famous as “Paris of East Java”, from 31 October – 2 November 2016.

The objective of this joint conference is to provide opportunities for researchers, scientists, engineers and vendors working in the area of electric power, electronic, telecommunication, control and informatics to exchange their ideas and also to present and discuss latest results and future directions of research and application, and developments in the converging technology and educations of electrical and electronics engineering. All accepted and presented papers will be published in one of the following publications:

- Proceeding ICNERE - EECCIS 2016
- Makara Journal of Technology (accredited by DIKTI)
ISSN : (P) 2355-2786, (E) 2356-4539
- Jurnal Teknologi (Scopus indexed)
ISSN : 2180-3722

This joint conference topics are include, however not limited to :

1. Nano electronics and nano photonic devices
2. Nano and micro electro mechanical systems (NEMS/MEMS)
3. Nano materials
4. Quantum information and computation
5. Nano technologies for medical applications
6. Power and energy, power electronics, renewable energy source and system
7. Electronics circuits, instrumentation, optoelectronics, FPGA & embedded system
8. Fiber optic, wireless & sensor networks, microwave, antenna and signal processing
9. Advance control system, automation, robotics and autonomous system
10. Innovative teaching and learning mechanism in electrical & electronics engineering education
11. Image processing, artificial intelligent, pattern recognition, knowledge discovery and security.

FOREWORD



Assalamu'alaikum warahmatullahi wabarakatuh

First of all, I would like to express my acknowledgement to the whole parties, lecturers, students, and all other people impossible to cite individually, for having involved in the good achievement of the organization of **the Joint International Conference** on the 3rd International Conference on Nano Electronics Research and Education (ICNERE) and the 8th International Conference on Electrical, Electronics, Communications, Controls, and Informatics System (EECCIS) 2016, collaboration between Brawijaya University, Universiti Tun Hussein Onn Malaysia (UTHM), University of Indonesia and Shizuoka University- Japan.

I also would like to express my gratitude to Prof. Robert Rieger, Ph.D (National Sun Yat Sen University, Taiwan), Prof. Masaaki Nagatsu (Shizuoka University, Japan) and Assoc. Prof. Dr. Nafarizal Nayan (Universiti Tun Hussein Onn Malaysia - UTHM) for having accepted to become the keynote speakers of this **Joint International Conference ICNERE-EECCIS 2016**.

The EECCIS 2016 Seminar follows the success of the previously held seminars of EECCIS 2000, 2004, 2006, 2008, 2010, 2012 and 2014. It becomes a part of scientific activity programmes in the Faculty of Engineering to contribute to the creation of Brawijaya University as a research and entrepreneurial university.

As a part of the Brawijaya University, *civitas academica* of the Faculty of Engineering play a very strategic and active role in producing a tight link to industry and society in general. It is hoped that through the Joint International Conference ICNERE-EECCIS 2016 the tight link could be maintained and improved either nationally or internationally, so that the scientific culture among the research and education institutions as well as its link-and-match to industry could bring out the welfare of the Indonesian society, and humanity in general.

Wassalamu'alaikum warahmatullahi wabarakatuh

Dr. Ir. Pitojo Tri Juwono, MT.

**Dean of Engineering Faculty
Brawijaya University**

WELCOMING MESSAGE



It is our pleasure to invite you to the 3rd International Conference on Nano Electronics Research and Education or ICNERE 2016, a collaborating event between Universitas Indonesia and Shizuoka University, Japan. This conference will be held in Malang, East Java Indonesia from October 31 to November 2, 2016. **This International event is being held in conjunction with the 8th International Conference on Electric Power, Electronic, Communication, Control, and Informatic Systems (EECCIS)**, a collaborating event between Universitas Brawijaya and Universiti Tun Hussein Onn Malaysia (UTHM).

As always, the conference will provide an important forum and opportunities for researchers and engineers from the industries, and professors as well as graduate students from academia to establish a scientific network and to discuss new ideas and developments in the converging technology and educations of electrical and electronics engineering. By attending the conference, you will become a part of the development of Electrical Engineering and Nano Electronics Research and Education.

We hope to welcome you in our midst of our friendly people and one of the very exotic place since centuries. We look forward to seeing you at the conference!

Prof. Dr. Harry Sudibyo S, DEA

General Chair

ORGANIZING COMMITTEE

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KEYNOTE SPEAKERS

Student centered design of CMOS programmable biosignal recorders

Robert Rieger

National Sun Yat Sen University, Taiwan

Abstract: Sensing the environment by means of very small and low power electronic circuits is an accelerating trend which paves the way for advanced applications in areas ranging from healthcare to the Internet-of-Things. This talk presents certain essential circuits for the multichannel monitoring of biomedical signals using integrated CMOS technology, including the configurable gain amplifier and analog-to-digital converter. The complexity of the designs combined with the rapid pace of product and innovation cycles frequently conflicts with the requirements in education and research. This speech presents front-end circuits which aim at providing a low-complexity analog implementation enhanced by digital control and processing lowering the entrance barrier for students when designing advanced integrated recording systems. This approach promises the implementation of first-time-right designs and minimizes the system design time by circuit reuse. Circuit examples are provided which are part of programmable monitoring systems recently realized in the presenter's research lab.



Prof. Robert Rieger, Ph.D
National Sun Yat Sen University, Taiwan

Biography

Robert Rieger was born in Duesseldorf, Germany, in 1975. He received the intermediate diploma in electrical engineering and the B.Eng. degree in electrical and electronics engineering from Chemnitz University of Technology, Germany, and the University of Kent, U.K., in 1998 and 2000 respectively.

He earned the Ph.D. degree in electronic and electrical engineering at University College London (UCL), U.K. in 2004. From 2004 to 2005 he was a Design Engineer with the Industry & Medical business unit of austriamicrosystems AG, Rapperswil, Switzerland (now AMS), where he was concerned with the design of high-reliability integrated analog circuits in CMOS technology.

Since an internship with Xanavi Informatics Co., Japan, in 1998, which was supported by a grant from the German Academic Exchange Service (DAAD), he became interested in locating to Asia. Hence, in February 2006 he joined the Electrical Engineering Department of National Sun Yat-sen University, Kaohsiung, Taiwan, where he is currently a Professor leading the Bionics Integrated Systems Laboratory.

Dr. Rieger is a Senior Member of the IEEE and the founding officer of the IEEE Engineering in Medicine and Biology Society (EMBS) Tainan Chapter. He is a member of the IEEE Technical Committees on Biomedical and Life Science Circuits and Systems (BioCAS), VLSI Systems and Applications (VTA), and Circuits & Systems Education and Outreach (CASEO). He is also a member of the Taiwan Chip Implementation Center (CIC) Peer-Review Committee and Technical Committee Member of the Bureau of Standards, Metrology & Inspection (BSMI) of the Taiwan Ministry of Economic Affairs. He also serves as an Associate Editor for IEEE Transactions on Biomedical Circuits & Systems (TBCAS) and for IEEE Transactions on Circuits & Systems I (TCAS-I). In 2005 he was also a Guest Editor for the special issue on Bioelectronic Circuits for Enhanced Diagnosis and Therapy of the IEEE Transactions on Circuits and Systems II (TCAS2). He was awarded with the 2014 IEEE Tainan Section Macronix Award ‘in recognition of outstanding contributions to advances of circuit design for wearable and implantable biomedical applications.’ His research interests are in the area of integrated electronics for biomedical application and low-power mixed-signal circuits.

The Future of Nanotechnology for Medical Applications

Masaaki Nagatsu

Shizuoka University
Research Institute of Electronics, Japan

Abstract: In this study we will present our recent experimental results on the advanced plasma nanotechnology for medical application. The virus and bacteria detection system using the plasma surface-functionalized carbon-encapsulated magnetic nano-particles (MNPs) fabricated by dc arc discharge and carbon nanotube(CNT) dot-array prepared with a combined thermal and plasma CVD device are presented. With antibody-immobilized carbon-encapsulated MNPs, we confirmed that influenza A type H1N1 virus concentration of 17.3-fold and Salmonella concentration of 70.9-fold were successfully achieved. These results were better than those obtained using commercially available magnetic beads. The feasibility of CNT dot-array as a microarray biosensor has been successfully demonstrated by maskless functionalization of amino (-NH₂) and carboxyl (-COOH) groups onto CNTs by using a microcapillary atmospheric pressure plasma jet.

Keywords: carbon-encapsulated magnetic nanoparticles; plasma surface functionalization; carbon nanotube array; virus detection; atmospheric pressure plasma jet



Prof. Masaaki Nagatsu
Shizuoka University, Japan

Biography

Masaaki Nagatsu was born in 1952. He earned the Ph.D. from Department of Electrical and Electronics Engineering, Graduate School of Engineering, Nagoya University, Japan, in 1985. From 1986 to 1988 he was a Visiting Researcher at University of California, Los Angeles (USA). From 1989 to 1991 he was a Lecturer at Nagoya University, Japan. From 1991 to 2001 he was an Associate Professor at Nagoya University, Japan. From 2001 to 2006, he was a Professor at Dept. of Electrical & Electronics Eng. Faculty of Eng., Shizuoka Univ. From 2006 to 2015, he was a Professor at Graduate School of Science and Technology, Shizuoka Univ. And from 2015 – present, he was a Professor, Research Institute of Electronics, Shizuoka Univ.

Some his professional activities are in 2008 as an Honorable Guest Professor in Institute of Plasma Physics, Chinese Academy of Science (China). From 2008 to 2015 he was Dean of Graduate School of Science and Technology, Shizuoka University. In 2014, he was an Adjunct Professor in University of Indonesia (Indonesia). In 2015, he was an Honorary Professor in Alexandru Ioan Cuza University (Romania).

His awards are in 2011 The 16th JSPF Award for Notable Contribution to Technology, The Japan Society of Plasma Science and Nuclear Fusion Research. In 2011, he got Takayanagi Award, Hamamatsu Foundation for the Promotion of Electronic Science. In 2012, he got The 10th Plasma Electronics Award, Division of Plasma Electronics, Japan Society of Applied Physics. In 2013, he got The 15th Award of Plasma Materials Science (Fundamental section), The 153rd Committee Plasma Materials Science, Japan Society for the Promotion of Science. In 2014, he got 8th JSAP Fellow Award, Japan Society of Applied Physics. In 2016, he got Prizes for Science and Technology (Research Category) The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology. His research interests are on medical and biological applications of plasma science and technology. He had published total 211 papers publication with peer review.

Plasma processing technology for future solar device fabrication

N. Nafarizal

Universiti Tun Hussein Onn Malaysia

Abstract: Plasma processing technology has been a major contributor to the development of front-end of current microelectronic industries. More than 50% of the processes in microelectronic industries require plasma processing technology. Therefore, we will not be able to develop nano-device and other advanced and sophisticated device without understanding the plasma processes. Plasmas have been used to deposit and etch various type of materials. During the fabrication of first generation silicon solar cell, plasma enhanced chemical vapor deposition (PE-CVD) have been used to deposit amorphous silicon film. Then, in the second generation of a solar cell, magnetron sputtering plasmas have been used to deposit various type of materials in thin film solar cells such as CIGS and Cd-Te. Recently, plasmas have been used to deposit materials for the third generation of solar cells at lower cost and higher efficiency. Plasmas have been used to alter the surface reaction of subsequence processes. The plasma process is a very useful tool since the process involves physical and chemical reactions. In the past, plasma equipment consists of the bulky vacuum chamber and pumping system. However, in recent technology, plasma system produces at atmospheric pressure condition and it has been explored for superhydrophobic treatment and thin film deposition.



Ass. Prof. Nafarizal Nayan, D. Eng.
Universiti Tun Hussein Onn Malaysia

Biography

Nafarizal Nayan received his B. Eng., M. Eng. and D. Eng. degrees from Nagoya University, Japan in 2003, 2005 and 2008, respectively. In 2005, he joined Universiti Tun Hussein Onn Malaysia (UTHM) as Lecturer during his Master Degree study at Nagoya University. He then, in 2008, start his actual work with Universiti Tun Hussein Onn Malaysia, as Senior Lecturer. His permanent position is at Department of Electronic Engineering, Faculty of Electrical and Electronic Engineering.

He headed Microelectronic Laboratory and Microelectronic and Nanotechnology – Shamsuddin Research Centre (MiNT-SRC) at UTHM in 2009-2013. He was promoted to Associate Professor in 2012. He has been engaged in the research of the characterization and design of low temperature plasma system using vacuum and non-vacuum methods. His research interest is on plasma diagnostics, plasma processing and thin film deposition. From 2013 to 2015, he visited the Quantum Science Engineering, Hokkaido University for visiting research on $\text{Cu}_2\text{ZnSnS}_4$ thin film fabrication using sputtering technique and synthesis and diagnostics of metal

nanoparticles. He is the author of more than 20 reviewed-journal papers, 100 conference papers including international invited talks.

PROGRAM SCHEDULE

ICNERE_EECCIS 2016 SCHEDULE

Venue : Hotel Royal Orchid Garden, Batu - East Java

Parallel Session (Monday - October 31, 2016)

08:00 - 14:30	REGISTRATION
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ROOM 1	Session Chair : Lukman Audah; Anton Widarta		
Time	Paper ID	Title	presenter
09:00 - 09:15			
09:15 - 09:30	1570298511	Performance Evaluation of Hypertext Transfer Protocol Over Terrestrial and Satellite Networks Liyana Zakaria (TM Berhad, Malaysia); Lukman Audah and Ansar Jamil (UTHM); Jiwa Abdullah (UTHM)	Audah
09:30 - 09:45	1570293703	Power Optimization for Tunable Microwave Generation Based on Mixing Two DFB Laser Using Polarizing Effect Nursidik Yulianto (Indonesia Institute of Sciences (LIPI), Indonesia); Purnomo Sidi Priambodo (UI); Bambang Widiyatmoko (Indonesian Institute of Sciences, Indonesia)	Yulianto
09:45 - 10:00	1570293901	Preliminary Studies on Establishment of Malaysia's National Standard of RF Attenuation Arshad Selamat (National Metrology Institute of Malaysia); Anton Widarta (National Metrology Institute of Japan, NMIJ/AIST, Japan); Mohd Nasir Zainal Abidin (National Metrology Institute of Malaysia, Malaysia)	Selamat
10:00 - 10:15	1570294220	A Review on the Japan National Standards of Radio Frequency and Microwave Attenuation Anton Widarta (National Metrology Institute of Japan, NMIJ/AIST, Japan)	Widarta

ROOM 2		Session Chair: Angger Abdul Razak; Yuning Widiarti	
Time	Paper ID	Title	presenter
09:00 - 09:15	1570303446	Bandstop Filter for Radar Application with L Resonator Dian Astuti (Universitas Mercu Buana, Indonesia); Ferdinand Yansyah (University of Mercu Buana, Indonesia); Mudrik Alaydrus (Universitas Mercu Buana, Jakarta, Indonesia)	Yansyah
09:15 - 09:30	1570292291	Joint Passive Time-Reversal and Adaptive Equalizer for Underwater Communication Yuning Widiarti (Institut Teknologi Sepuluh Nopember & Politeknik Perkapalan Negeri Surabaya, Indonesia)	Widiarti
09:30 - 09:45	1570303931	Numerical Examination on Transmission Properties of FBG with GPU Support Angger Abdul Razak and Mitsuhiro Yokota (University of Miyazaki, Japan)	Abdul Razak
09:45 - 10:00	1570305750	Air Pollution Monitoring Integrated on Smart Home System Using ZigBee Wireless Sensor Networks Octarina Nur Samijayani (University of Al Azhar Indonesia, Indonesia)	Samijayani
10:00 - 10:15	1570305780	Directed Diffusion Based Routing Protocol Wireless Sensor Networks for A Forest Preventive Fire System At Tesso Nilo National Park Indra Yasri (Universitas Riau, Indonesia)	Yasri

ROOM 3		Session Chair: Rudy Yuwono; UcuK Darusalam.	
Time	Paper ID	Title	presenter
09:00 - 09:15	1570306345	Log Periodic Microstrip Antenna for Digital Video Broadcasting Application Indra Surjati and Yuli Kurnia Ningsih (Trisakti University, Indonesia); Syah Alam (Universitas 17 Agustus 1945 Jakarta, Indonesia)	Alam
09:15 - 09:30	1570306914	Mitigating BER of FSO Communications by Minimizing the Temporal Fluctuation in Signal Spectral UcuK Darusalam (Universitas Nasional, Indonesia)	Darusalam
09:30 - 09:45	1570306965	A Paddy Soil Monitoring System Based on Wireless Sensor Networks Emansa Hasri Putra (Politeknik Caltex Riau, Indonesia)	Putra
10:00 - 10:15			

ROOM 4		Session Chair: Yus Natali; Ruth Anindita	
Time	Paper ID	Title	presenter
09:00 - 09:15	1570316087	Drivetest Methods for 3G Network Quality Analysis Sigit Kusmaryanto (Universitas Brawijaya, Indonesia)	Kusmaryanto
09:30 - 09:45	1570309328	Singly-fed Circularly Polarized Triangular Microstrip Antenna with Truncated-tip for CP-SAR Application Muhammad Fauzan Edy Purnomo (UB); Hadi Suyono (UB); Dwi Kurniawan, Ali Mustofa and Sholeh Pramono (UB); Rahmadwati Rahmadwati (UB)	Fauzan
09:45 - 10:00	1570315073	Requirement Analysis on Received RF Voltage Drive for Electro-Optic Modulator in Distributed Antenna System Yus Natali (Akademi Teknik Telekomunikasi Sandhy Putra Jakarta, Indonesia); Purnomo Priambodo (Universitas Indonesia, Indonesia)	Natali
10:00 - 10:15	1570315264	DESIGN OF E-SLOT MICROSTRIP ANTENNA FOR WLAN 2.4 GHz Ruth Anindita (University of Brawijaya, Indonesia); Onny Setyawati (Brawijaya University, Indonesia); Rahmadwati Rahmadwati (University of Brawijaya, Indonesia)	Anindita

Program Session (Monday - October 31, 2016)

10:15 - 10:30	COFFEE BREAK	
10:30 - 10:45	Dance performance	
10:45 - 11:00	Opening speech	General chair
11:00 - 11:15	Welcoming Speech	Dean of Faculty of Engineering, Universitas Brawijaya
11:15 - 11:45	Keynote Speaker 1 : Prof. Robert Rieger, Ph.D. "Student centered design of CMOS programmable biosignal recorders"	
11:45 - 13:15	LUNCH	
13:15 - 13:45	Keynote Speaker 2 : Prof. Dr. Masaaki Nagatsu. "The Future of Nanotechnology for Medical Applications"	
13:45 - 14:15	Keynote Speaker 3 : Assoc. Prof. Dr. Nafarizal bin Nayan "Plasma processing technology for future solar device fabrication"	
14:15 - 14:30	COFFEE BREAK	

Parallel Session (Monday - October 31, 2016)

ROOM 1	Session Chair: Y Simamora; Andriani Parastiwi.		
Time	Paper ID	Title	presenter
14:30 - 14:45	1570289325	Study of Solar Electricity Powered Air Conditioner in a Tropical Hot Climate Elieser Tarigan (Electrical Department and Center for Renewable Energy Studies, PSET, University of Surabaya)	Tarigan
14:45 - 15:00	1570293989	Phase Shifted Boost-Cuk Converter for Renewable Energy Applications Alfredo Medina, Alam Salguero and Taufik Taufik (California Polytechnic State University, San Luis Obispo, USA); Andriani Parastiwi (State Polytechnics of Malang, Indonesia)	Parastiwi
15:00 - 15:15	1570294013	Integration of Distributed Generation in Radial Distribution Systems Nuha Nadhiroh (INSTITUT TEKNOLOGI SEPULUH NOPEMBER, Indonesia); Ontoseno Penangsang (Institut Teknologi Sepuluh Nopember, Indonesia)	Nadhiroh
15:15 - 15:30	1570294109	Estimation Losses in Radial Distribution Network Under Unbalanced Loading Condition Considering Time Varying Load Y Simamora (INSTITUT TEKNOLOGI SEPULUH NOPEMBER, Indonesia); S Suyanto and O Penangsang (Lecturer, Indonesia)	Simamora
15:30 - 15:45	1570303295	Influence of Load Properties on the Performance of Low-Speed Single-Phase Self-Excited Induction Generator Hari Santoso (Brawijaya University, Indonesia); Rini Nur Hasanah (Brawijaya University & Faculty of Engineering, Indonesia); I Nyoman Gde Wardana and Budiono Mismail (Brawijaya University, Indonesia)	Santoso
15:45 - 16:00	1570303539	Power System Stabilizer Optimization Based on Modified Differential Evolution Algorithm and Network Reduction Considering Network Losses Rohmanita Duanaputri and Adi Soeprijanto (ITS, Indonesia); Ardyono Priyadi (ITS, Indonesia); Dheny Ashari Hasan (ITS, Indonesia)	Duanaputri

ROOM 2		Session Chair: Dikpride Despa; Ida Bagus Fery Citarsa	
Time	Paper ID	Title	presenter
14:30 - 14:45	1570303833	Optimum Operation Stand-Alone Microgrid Using PSO Algorithm to Considering Life Time Battery Vicky Kusuma (Jl. Raya ITS Keputih, Surabaya, Jawa Timur, Indonesia)	Kusuma
14:45 - 15:00	1570304628	Implementing of Lyapunov Function to PID Voltage Control for Single Phase Rectifier Using Low Cost Microcontroller Shamsul Zulkifli (Universiti Tun Hussein Onn Malaysia, Malaysia)	Zulkifli
15:00 - 15:15	1570306762	Analysis of Bidirectional VSI as Regenerative Braking Converter for BLDC Motor Rini Nur Hasanah (UB, Indonesia); Victor Andrian, Soeprapto Soeprapto and Hadi Suyono (UB, Indonesia)	Andrian
15:15 - 15:30	1570307040	Comparison Analysis of Phase-shifted and Level-Shifted Carrier-Based PWM on the Five-Level Single-Phase Cascaded H-Bridge (CHB) Multilevel Inverter Ida Bagus Fery Citarsa (University of Mataram, Indonesia)	Citarsa
15:30 - 15:45	1570307053	Multi-Area Smart Monitoring of Electrical Quantities Based on Mini Single Board Computer BCM 2835 Dikpride Despa, Mardiana Rendra and Gigih Forda Nama (University of Lampung, Indonesia); Michael Bernard (University of Alberta - Edmonton, Alberta, Canada); Muhamad Komarudin (University of Lampung, Indonesia)	Despa
15:45 - 16:00	1570308005	Schottky Diodes Comparison for Differentially-Driven Rectifier Fitri Yuli Zulkifli, Amirsyah Rayhan Mubarak and Basari Basari (Universitas Indonesia, Indonesia); Eko Tjipto Rahardjo (University of Indonesia, Indonesia)	Zulkifli

ROOM 3		Session Chair	Hadi Suyono; Setyo Nugroho.
Time	Paper ID	Title	presenter
14:45 - 15:00	1570308946	A Numerical Study on Twist-Tapered Blade for Low-Speed Horizontal Wind Turbine Joke Pratilastiarso and Setyo Nugroho (Politeknik Elektronika Negeri Surabaya, Indonesia); Teguh Hady Ariwibowo and Akhmad Khilmy (Electronic Engineering Polytechnic Institute of Surabaya, Indonesia)	Nugroho
15:00 - 15:15	1570309200	Injection Impact of Hybrid Embedded Generation in Distribution System Hadi Suyono (UB, Indonesia); Rini Nur Hasanah (UB, Indonesia); Panca Mudjirahardjo (UB, Indonesia); Muhammad Fauzan Edy Purnomo (UB, Indonesia)	Suyono
15:15 - 15:30	1570311715	The Effect of Position of Anti Notch on the Surface of Stator Teeth and Permanent Magnet to Cogging Torque Reduction Herlina Wahab (Sriwijaya University & University of Indonesia, Indonesia)	Wahab
15:45 - 16:00	1570321666	Design of Floating Waterwheel for Harnessing River-Flow Surface-Stream Energy Suparman Suparman and Hadi Suyono (Brawijaya University, Indonesia); Rini Nur Hasanah (Brawijaya University & Faculty of Engineering, Indonesia)	Suparman

ROOM 4		Session Chair: Catur Apriono; Nabihah Ahmad.	
Time	Paper ID	Title	presenter
14:30 - 14:45	1570320416	Design of an Automation System for Hydroponic Plantation Based on the Ebb & Flow Method Wahidin Wahab (University of Indonesia, Indonesia); Andhika Djaffri and Winarsita Sotyaji (Universitas Indonesia, Indonesia)	Wahab
14:45 - 15:00	1570313969	Data-Logging in an Acidity Measurement System Using pH-Sensor with Circular Nickel-Wire Electrodes M. Julius St. (UB, Indonesia); Sudjito Suparman, Eko Siswanto and Denny Widhiyanuriyawan (UB, Indonesia)	Julius
15:15 - 15:30	1570287943	A Conceptual Framework of High-Dimensionality CAP Modulation on Programmable Chip for Indoor VLC Network Sharifah Saon, Abd Kadir Mahamad and Maisara Othman (Universiti Tun Hussein Onn Malaysia, Malaysia)	Saon
15:30 - 15:45	1570306032	Dual-Port SRAM Design with Low Power Technique Nabihah Ahmad (Universiti Tun Hussein Onn Malaysia & Faculty of Electrical and Electronic Engineering, Malaysia); Nurdyana Mat Jainudin (Universiti Tun Hussein Onn Malaysia, Malaysia)	Ahmad
18:30 - 20:30	GALA DINNER		

Parallel Session (Tuesday - November 1, 2016)

08:00 - 13:00	REGISTRATION
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ROOM 1

Session Chair: Gunawan Wibisono; Anak Agung Ngurah Gde Sapteka.

Time	Paper ID	Title	presenter
09:00 - 09:15	1570306266	Design and Implementation of M2M Technology in Smart Street Light System Node with RS 485 Communication and Hybrid Power Source Gunawan Wibisono (University of Indonesia, Indonesia); Antonius Putranto (Universitas Indonesia, Indonesia)	Wibisono
09:30 - 09:45	1570308088	A Strategy to Reduce Stray Capacitance on Electrical Capacitance Tomography Hardware Arbai Yusuf (Universitas Indonesia & C-Tech Labs Edwar Technology, Indonesia)	Yusuf
09:45 - 10:00	1570309216	A Study of Electric Field of Gaussian Silicon P-N Junction Anak Agung Ngurah Gde Sapteka, Anak Agung Ngurah Made Narottama, I Nyoman Sukarma and I Gusti Putu Mastawan Eka Putra (Politeknik Negeri Bali, Indonesia); Mangaraja Longgam Saragi (Uniiversitas Mpu Tantular, Indonesia)	Sapteka
10:00 - 10:15	1570301615	The Development of Kartini Reactor Data Acquisition System to Support Nuclear Training Centre (NTC) Adi Abimanyu (Center for Science and Technology Accelerator, Indonesia); Syarip Syarip and Elisabeth Supriyatni (Center for Accelerator Science and Technology, Indonesia)	Abimanyu

ROOM 2		Session Chair: Onny Setyawati; Retno Purnamaningsih	
Time	Paper ID	Title	presenter
09:00 - 09:15	1570309326	Design of a Low-Cost Microcontroller-Based ECG Signal Generator Nanang Sulistiyanto (UB, Indonesia); Mochammad Rifan (UB, Indonesia); Raden Arief Setyawan and Onny Setyawati (UB, Indonesia)	Setyawati; Setyawan
09:15 - 09:30	1570313974	The Evaluation of Tropical Tuber Properties Using Far Field Method Onny Setyawati and Nanang Sulistiyanto (Brawijaya University, Indonesia)	Setyawati
09:30 - 09:45	1570317031	Modelling of a Four Branch Power Splitter Using III-nitrides Semiconductor for Long Wavelength Optical Telecommunication Retno Purnamaningsih and Nji Poespawati (Universitas Indonesia, Indonesia)	Purnamaningsih
10:00 - 10:15	1570303963	ScanCart: Android Barcode Scanner for E Commerce Stock Inventory Sharifah Saon (Universiti Tun Hussein Onn Malaysia, Malaysia)	Saon
ROOM 3		Session Chair : Agung Darono; Mochammad Rusli	
Time	Paper ID	Title	presenter
09:00 - 09:15	1570291090	Use of IT in Indonesian Tax Administration System: Duality of Tax Technology Perspective Agung Darono (Tax Education and Training Center & Ministry of Finance, Indonesia)	Darono
09:15 - 09:30	1570303820	Flight Control System Improvement for Quadrotor Using Particle Swarm PID (PS-PID) Andi Adriansyah, Anwar Minarso and Eko Ihsanto (Universitas Mercu Buana, Indonesia)	Adriansyah
09:45 - 10:00	1570309202	Design of Adaptive Sliding Mode Control for DC Motor Speed Control Ramadhani Kurniawan Subroto (Brawijaya University, Indonesia)	Subroto
10:00 - 10:15			

ROOM 4		Session Chair	:Muhammad Aziz Muslim; Youness Lahdili
Time	Paper ID	Title	presenter
09:00 - 09:15	1570308165	Conception of an Autonomous Driving of Unmanned Vehicles Using Stereo Vision Youness Lahdili (UTHM); Afandi Bin Ahmad (UTHM)	Lahdili
09:15 - 09:30	1570308096	Injection Duration Control in a Four Strokes Engine Based on Throttle Position Muhammad Aziz Muslim, Goegoes Dwi Nusantoro, Dwi Fadilla Kurniawan and Ganda Lesmana (Brawijaya University, Indonesia)	Aziz Muslim
09:30 - 09:45			
09:45 - 10:00	1570319166	Traffic Monitoring System for Wireless Network Using Embedded System Heru Nurwarsito and Gembong Setyawan (UB, Indonesia); Kautsarani Alam (UB, Indonesia)	Nurwarsito
10:00 - 10:15	1570305967	Design of Sensor Reading Visualization on Line Follower Robot Akhmad Zainuri (Brawijaya University, Indonesia)	Zainuri
10:15 - 10:30	COFFEE BREAK		

ROOM 1		Session Chair : Nafarizal Nayan; Fajar Setiawan	
Time	Paper ID	Title	presenter
10:30 - 10:45	1570293958	Nitrogen Gas Temperature Evaluation in Pulse-Modulated RF Magnetron Sputtering Plasmas Nafarizal Nayan (UTHM; Microelectronic and Nanotechnology - Shamsuddin Research Centre (MiNT-SRC), Malaysia); Soo Ren How (UTHM, Malaysia); Mohd Khairul Ahmad (UTHM, Malaysia); Mohd Zainizan Sahdan (UTHM, Malaysia)	Nayan
10:45 - 11:00	1570294130	Surface Characterization of Glass Substrate Exposed by Atmospheric Pressure Plasma Needle Elfa Rizan Rizon (UTHM, Malaysia); Nafarizal Nayan (UTHM; Microelectronic and Nanotechnology - Shamsuddin Research Centre (MiNT-SRC), Malaysia); Chin Fhong Soon (UTHM; Microelectronic and Nanotechnology-Shamsuddin Research Center, Malaysia); Mohd Khairul Ahmad (UTHM, Malaysia); Mohd Zainizan Sahdan (UTHM, Malaysia)	Nayan
11:00 - 11:15	1570294215	Investigation of Gas Temperature Evaluation in Magnetron Sputtering Plasma Using Two Different Resolution of Spectroscopy Soo Ren How (UTHM, Malaysia); Nafarizal Nayan (UTHM; Microelectronic and Nanotechnology - Shamsuddin Research Centre (MiNT-SRC), Malaysia); Jais Lias (UTHM, Malaysia)	Nayan
11:30 - 11:45	1570304085	Silicon Single Boron Transistor Yukinori Ono (Shizuoka University, Japan)	Ono

ROOM 2		Session Chair : Murakami Kenji; Hiroshi Inokawa.	
Time	Paper ID	Title	presenter
10:30 - 10:45	1570303961	Growth of Vertically Aligned ZnO Nanorods Array and Its Application to Perovskite-type Solar Cells Murakami Kenji, Albertus Bramantyo and Masayuki Okuya (Shizuoka University, Japan); Nji Poespawati and Arief Udhiarto (Universitas Indonesia, Indonesia)	Kenji
10:45 - 11:00	1570280335	A Framework for Optimum Contour Detection Cahyo Crys dian (UIN MALIKI Malang, Indonesia); Bayu Adhi Nugroho (Universitas Islam Negeri (UIN) Sunan Ampel Surabaya, Indonesia)	Crys dian
11:00 - 11:15	1570303995	Comparative Study on Metal Resistor and MOSFET-Based THz Bolometers Hiroshi Inokawa, Ajay Tiwari, Takeo Ueta and Hiroaki Satoh (Shizuoka University, Japan); Catur Apriono (Universitas Indonesia, Indonesia); Eko Tjipto Rahardjo (University of Indonesia, Indonesia); Norihisa Hiromoto (Shizuoka University, Japan)	Inokawa
11:30 - 11:45	1570309197	Non Invasive Sensors for Bearing Damage Identification Using Sound Signal Frequency Analysis Muhammad Aswin (Brawijaya University - Malang, Indonesia)	Aswin

ROOM 3		Session Chair	Mohd Khairul Ahmad; Yoshimasa Kawata.
Time	Paper ID	Title	presenter
10:30 - 10:45	1570304409	Improvement in Film Quality of Hexagonal Boron Nitride Grown by Chemical Vapor Deposition Kazuhiko Hara, Naoki Umehara, Atsushi Masuda, Takaki Shimizu, Tetsuya Kouno and Hiroko Kominami (Shizuoka University, Japan)	Hara
10:45 - 11:00	1570304881	The Effect of Titanium Dioxide Nanorods to the Performance of Dye-Sensitized Solar Cell Mohd Khairul Ahmad (UTHM, Malaysia); Nurul Syafiqah Mohamed Mustakim (UTHM, Malaysia); Chin Fhong Soon (UTHM; Microelectronic and Nanotechnology-Shamsuddin Research Center, Malaysia); Nafarizal Nayan (UTHM; Microelectronic and Nanotechnology - Shamsuddin Research Centre (MiNT-SRC), Malaysia); Rahmat Sanudin (UTHM, Malaysia); Suriani Abu Bakar and Azmi Mohamed (Universiti Pendidikan Sultan Idris, Malaysia); Murakami Kenji and Shimomura Masaru (Shizuoka University, Japan); Mohamad Hafiz Mamat and Mohd Firdaus Malek (Universiti Teknologi MARA, Malaysia)	Ahmad
11:00 - 11:15	1570309187	Label-Free Cellular Structure Imaging with High Resolution Using an Electron-Beam Excitation- Assisted Optical Microscope Yoshimasa Kawata (Shizuoka University, Japan)	Kawata
11:15 - 11:30	1570303932	Response of Microcantilever Vibration Due to CO Gas in Vacuum Condition Lia Aprilia (Shizuoka University, Japan); Ratno Nuryadi (BPPT, Indonesia); Djoko Hartanto (University of Indonesia, Indonesia); Makoto Hosoda, Yoichiro Neo and Hidenori Mimura (Shizuoka University, Japan)	Aprilia
11:30 - 11:45	1570304627	Minimizing Tower of Base Tranceiver Station with Considering Coverage Area Using Fuzzy Clusterring Means and Particle Swarm Optimization (FCM-PSO) - Faqih Rofii, MT (Universitas Widyagama Malang, Indonesia); Diky Siswanto (University of Leeds, United Kingdom); Fachrudin Hunaini (Widya Gama University, Indonesia); Ahmad Rijal Kafy (Universitas Widyagama Malang, Indonesia)	Rofii

ROOM 4		Session Chair	Ihsan Ibrahim; Muhammad Muzakkir Mohd Nadzri.
Time	Paper ID	Title	presenter
10:30 - 10:45	1570303962	Single and Coupled-Dopants as Quantum Dots for Room Temperature Single-Electron Tunneling Daniel Moraru (Shizuoka University & Research Institute of Electronics, Japan); Arup Samanta and Michiharu Tabe (Shizuoka University, Japan)	Moraru
10:45 - 11:00			
11:00 - 11:15	1570294267	Conpot Analysis: Low-Interaction Honey-pot as Attack Detection System on Industrial Network Control System / SCADA Anak Agung Putri Ratna (UI, Indonesia); Mahardianto Yudha Bestari, Ihsan Ibrahim, Prima Dewi Purnamasari and Fransiskus Astha Ekadiyanto (UI, Indonesia); Muhammad Salman (UI, Indonesia)	Ibrahim
11:15 - 11:30	1570294275	NOAA Satellite Based with OpenCV Library Weather Monitoring System Software Development Ihsan Ibrahim (UI, Indonesia); Gunawan Wibisono (UI, Indonesia); Prima Dewi Purnamasari (UI, Indonesia)	Ibrahim
11:30 - 11:45	1570295207	Application of Microcapillary Atmospheric Pressure Plasma Jet as a Patterned Surface Modification of Carbon Nanotube Microarray Tomy Abuzairi (Shizuoka University, Japan; Universitas Indonesia, Indonesia)	Abuzairi
11:45 - 13:00	LUNCH		

ROOM 1		Session Chair		Fransiskus Astha Ekadiyanto; Farid P Putera.	
Time	Paper ID	Title	presenter		
13:00 - 13:15	1570307008	Greedy Algorithm and FIS Sugeno for Determining Evacuation Routes in Eruption of Merapi Mountain in Indonesia Abdul Aziz (Universitas Sebelas Maret, Indonesia); Ananto Setyadi (Sebelas Maret University, Indonesia); Esti Suryani (University of Sebelas Maret, Indonesia)	Aziz		
13:15 - 13:30	1570309233	Predict Drug Addict Using Linear Discriminant Analysis Based on Eyes and Faces Picture Bagus Priambodo (University of Mercu Buana)	Priambodo		
13:30 - 13:45	1570317579	A Performance Analysis of Online Video Classification System Based on Tag Using MapReduce for Internet Content Profiling Fransiskus Astha Ekadiyanto and Adhika Putra (Universitas Indonesia, Indonesia)	Ekadiyanto		
13:45 - 14:00	1570318821	3D Human Brain Tumor Detection from MRI Image Using K-Means Clustering, Non-Local Means, Thresholding and Marching Cube Dodi Suidiana, Farid P Putera and Basari Basari (Universitas Indonesia, Indonesia)	Putera		
14:00 - 14:15	1570320423	APT Detection Design Using DNS Traffic Analysis Muhammad Manggalanny (UI; ID-SIRTII/CC, Indonesia); Kalamullah Ramli (Universitas Indonesia, Indonesia)	Manggalanny		
14:30 - 15:00	COFFEE BREAK				
21:00 - 22:00	PICK UP AT HOTEL FOR TOUR TO BROMO MOUNT				

Multi-Area Smart Monitoring of Electrical Quantities Based on Mini Single Board Computer BCM 2835

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Abstract- Multi-Area Smart Monitoring Systems are application and devices that can monitor the amount of electricity at various locations in the distribution panel with two or more different locations. The Single Board Computer BCM2835 SoC, ARM11767JZF-S 700 MHz processor (Raspberry Pi model B) is utilized to serve as interfaces for obtaining data of electrical quantities and save the data into the database system. All data utilized in this study are obtained from two different locations namely LAB-JTE building and ICT-UNILA building, and these data have been recorded and sent through the Local Area Network connection to a computer server and monitored in real time.

From the results of monitoring conducted from May 30th until June 1st 2016 shown that the voltage, current and load connected to the monitored phase relatively has an asymmetric trends. The monitoring results also demonstrate that at noon, the electrical energy consumption trends in UNILA is in accordance with the working hours in UNILA. Finally, by comparing the results of monitoring the electrical quantities trend at LAB-JTE and ICT-UNILA building shown that the conditions of electrical quantities in ICT-UNILA building has a better measurement result.

Keywords— Multi-area panel distribution, real time monitoring, Electrical Quantities, BCM2835, UNILA.

I. INTRODUCTION

University of Lampung (UNILA) has always been implementing some of its developmental plans by working tirelessly to increase the quality and service in various ways such as the development of information technology, improvement of infrastructure as well as laboratory equipment which have an influence in increasing the number of electrical energy consumption. The electrical equipment should be able to work normally within the limits the standard values. But in reality, abnormal conditions may occur in the electrical quantities for long duration. If these conditions are not monitored, this can result in electrical outages and even damage to the equipment.

To alleviate the above mentioned problems, UNILA built a system that can provide real-time information in cases of both normal and abnormal events. With such a system, it is expected that if an abnormal condition is monitored, the operator can take a proper action early, so that a sudden

blackout conditions and the risk of equipment damage can be avoided.

This study is a continuation of the results of electrical quantities monitoring in UNILA [1]. However, the previous research is still focused on one of the panel that exist in Integrated Laboratory of Electrical Engineering Departement (LAB-JTE). For LAB-JTE, data are only stored on a Raspberry Pi and then some off-line analysis are carried out. In fact, UNILA has many buildings and need to be monitored in order to take preventive action or protection in case of abnormal conditions. Hence, this research is developed for multi-area system, in an effort to monitor the electrical quantities at multiple locations panel of three phase power distribution network, located in different buildings at the same time.

Mini Single Board Computer BCM 2835, ARM11767JZF-S 700 MHz processor (Raspberry Pi model B) are main components used in this study. Raspberry Pi serves as an interface for getting the data of electrical quantities and save the data to the database system [2]. Electrical quantities of data on two distribution panel measured by the sensor is sent through the Internet and stored on a computer server that can be accessed by the manager. Finally, the trend information of electrical quantities in real time considering the two different locations can be monitored simultaneously. Furthermore, the expected results of such monitoring may be used as a reference for stakeholders with respect to maintenance and planning for the future models.

II. RELATED WORKS

A. Previous Research

Some researchers have carried out related works in regards to real-time monitoring of electrical quantities and stability of power systems [1] - [4]. In addition, previous studies which is consider as a significant referenced in this research considered the use of Microcontroller, Raspberry Pi, Arduino and WEB application for the measurement and monitoring system [5]-[12]. References [1] and [4] which are mainly associated with the design and prototype of monitoring electrical quantities such as voltage, current, power, $\cos \phi$ and energy consumption application using BCM2835 are also considered the primary references of this work. In [1] and [4] measured data are

stored in real-time on a database server based Linux and MySQL server. Data obtained are further processed by the web server so that it appears in the form of historical statistical chart that can be accessed online through the Internet. However, [1] and [4] are still only applied to one panel of three phase distribution system in UNILA. The works of the above mentioned references however had some limitations with respect to developing a multi-area system that can be monitored in real time. Therefore, other researches are still required for a more desirable results and this is the objective of this paper.

B. Hardware Topology Design

Fig. 1 illustrates a design of the hardware topology for smart monitoring devices connected to arduino and BCM 2835 (Raspberry Pi) through GPIO pin. Obtained data such as current, voltage, power, $\cos \phi$ an energy consumption will be recorded in real-time on a database server based on Linux and MySQL server and will be processed further by a WEB server and appear in the form of historical statistical chart that can be accessed online through the Internet.

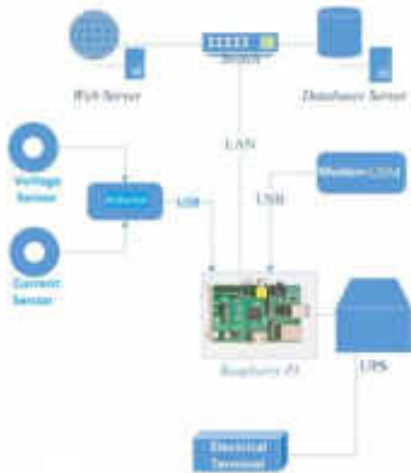


Fig. 1 Hardware Topology Design for Smart Monitoring System

III. RESEARCH METHODOLOGY

A. Block Diagram System

In order to understand the system easier, the block diagram is described as shown in Fig. 2:

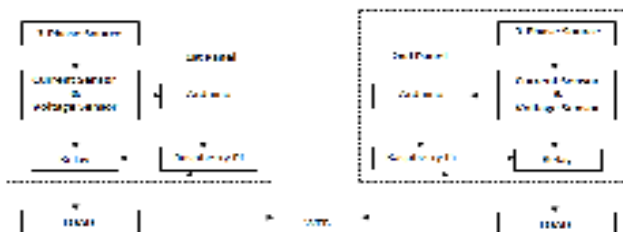


Fig. 2 Block Diagram System

B. Hardware Design

In this study, two hardware prototypes with the same design are made and positioned in the two of three-phase distribution panels with different locations. The design of the hardware is structured by electronic components as described in Fig. 3 below:



Fig. 3 Hardware Design

C. Program Design

Python programming [13] is used to create several function and routine that run on Raspberry Pi, such as: Sensor's data program reader, calculation program to obtain the electrical quantity, record the electrical quantity data, data base system receiver program and WEB interface display.

Current and voltage values will be measured directly, while for other electrical quantities can be determined using equations [14]

$$E = P.t (Wh)$$

$$E = (P.t) / 1000 (kWh)$$

$$P = E / t$$

$$P = V . I \cos \phi$$

$$Pf = P / (V . I)$$

Where:

- P = Power (Watts) ; E= Energy consumption (KWh)
- t = time (hours) ; V = Voltage (Volt)
- I = Current (Amper) ; Pf = Power Factor ($\cos \phi$)

IV. RESULTS AND DISCUSSION

A. Prototype Testing

Prototype designed has been tested with variations of load. Table 1 shows a data for prototype result compared to measurement device (multi-meter)

TABEL.1
TEST RESULTS

No	Various of Load	Test Results					
		Volt (v)		Current (I)		Pf ($\cos \phi$)	
		Proto type	Volt meter	Proto type	Ampere Meter	Proto type	Cos ϕ meter
1	Load 1	221,10	220	2,2	2,2	0,99	0,99
2	Load 2	221,95	222	5,28	5,27	0,99	0,99
3	Load 3	220,75	221	0,44	0,59	0,99	0,99

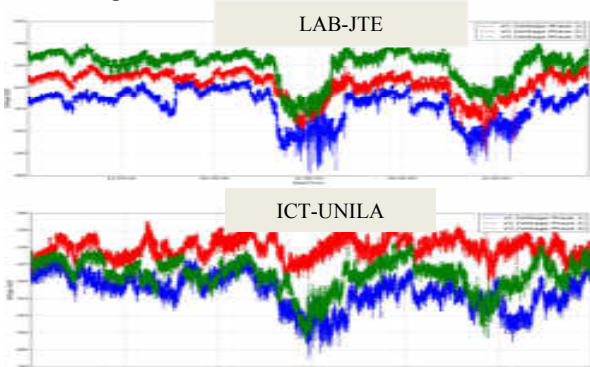
Tabel.1 is a measurement test results using hardware prototype compared to the results of standard measuring devices owned (multi-meter). It shows that a prototype and multi-meter have

a very small difference in results, so it can be concluded that this tool is reliable enough to operate.

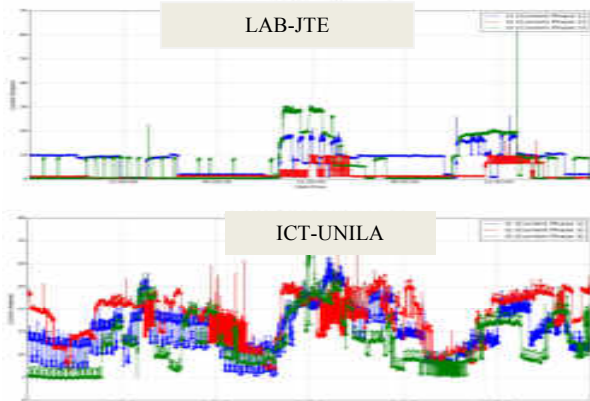
B. Results of System Testing

The testing of the system was done at two different locations; 3-Phase distribution panel of LAB-JTE building and ICT-UNILA building. The results of the monitoring system in both buildings are stored in a data base system MySQL server, and the final step is displaying the data from the existing database into a WEB interface. In this test, the database was split into five tables that are; voltage, current, power, $\cos \phi$ and energy consumption. The trend of measurement results are displayed in WEB interface statistics chart. Monitoring charts results for each measurements describe are in Fig. 4 (a, b, c, d, and e). The graphs show the result of data measurement on multi area monitoring system during May 30th until June 1st 2016.

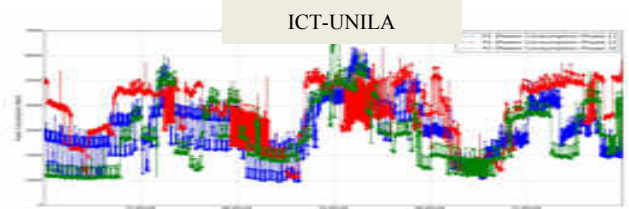
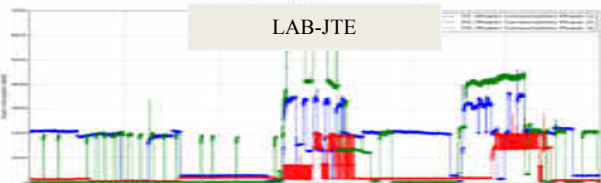
a. Voltage Monitoring



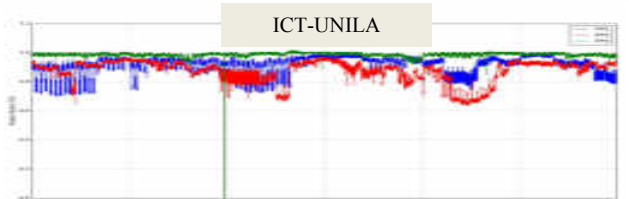
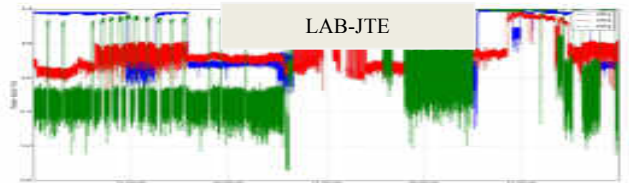
b. Current Monitoring



c. Power Consumption Monitoring



d. Power Factor ($\cos \phi$) Monitoring



e. Energy Consumption Monitoring

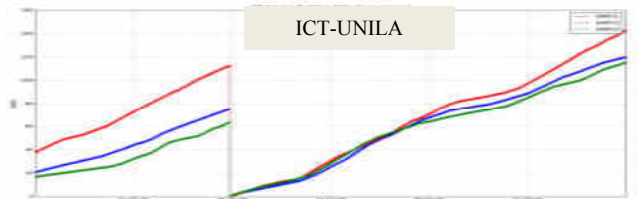
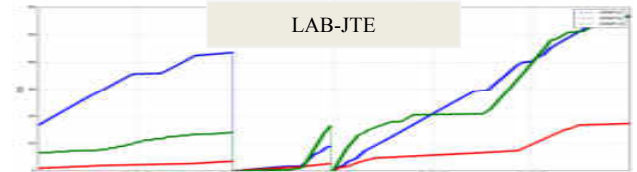


Fig. 4 Results of Monitoring Graphs during May 30th until June 1st, 2016

From the graph of electrical quantities, monitoring results are shown in Fig. 4 (a-e) for LAB-JTE and ICT-UNILA, the trend is as follows:

a. Voltage Monitoring

Voltage rating is about 200 V to 240 V. It can be seen from the graph for each phase shown in Fig.4 (a), the voltage value at two locations are not balance. Voltage drop occurs during the day (working hours) with lowest value for three phase system both in LAB -JTE and ICT UNILA. This illustrates the imbalance load mounted on each phase and electric energy consumption patterns are not evenly distributed, are still focused on the time of day.

b. Current Monitoring

The data shows that monitored current in each phases at two locations are not in balance condition. From the graph of Fig. 4 (b), it shows that the current will increase during

working hours (8:00 to 16:00) with 35 A highest value at ICT-UNILA building. This case can be happened because more activities in UNILA are doing during the working hours, while at the night were only used for lighting and air conditioning.

c. Power Monitoring

From the graph in Fig. 4 (c), it can be seen that the power consumption tends to be greater in working hours. If we note the power at each phase, then the electrical energy consumption in ICT-UNILA building is larger than LAB-JTE. This is understandable because of the many activities carried on during the day ICT-UNILA.

d. Power factor Monitoring

The power factor monitoring charts shows where the value of the power factor was obtained from the calculation using voltage and current measurement data. This is illustrated in Fig. 4 (d), where the power factor at ICT ranged from 0.7 to 0.99 while in LAB-JTE it is around 0.3 to 1. This means that the power factor in ICT-UNILA is better compared to LAB-JTE. One of the Factors that can influence the value of the power factor is reactive load. Hence, if the value of the power factor is unstable, probably it is the caused by the changes of reactive power in the load.

e. Energy Consumption Monitoring

In general, since the load connected to each phase is not balance, the energy consumption of each phase will behave in the same manner. The total energy consumption in ICT-UNILA is greater than the LAB-JTE. This is illustrated in Fig. 4 (d), that the activity involving the use of electrical appliances in ICT-UNILA more out of Lab-JTE.

V. CONCLUSION AND FUTURE WORKS

A. Conclusions

The paper carried out monitoring of the electrical quantities trend at LAB-JTE to that of ICT-UNILA. The results of the monitoring may be utilized as a reference for stakeholders with respect to maintenance and planning for the future models. The monitoring results show that electrical quantities at two difference locations that have been monitored tends to create unbalance condition. However, electrical quantities monitored in ICT-UNILA is better compared to LAB-JTE.

On the other hand, the electrical quantities for each phase that have been monitored in UNILA are not in balance condition. This condition indicates that the load distribution for each phase is un-balance and need to be fixed. Electrical energy Consumption in UNILA is greater during the day (during working hours) compared to the evening. Electrical quantities condition in ICT-UNILA is better compared to LAB-JTE.

B. Future Works

In order to make the utilized system become better, this application should be integrated with a notification system, and extend the project for several places. It is highly recommended to develop mobile application for this project. Besides, the data results from this research should be used as reference for planning an estimation and better electrical system of UNILA in the future.

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