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CONFERENCE PROGRAMS AND ABSTRACT

**INTERNATIONAL CONFERENCE
FORUM IN RESEARCH, SCIENCE, AND TECHNOLOGY 2018**

OCTOBER 30-31, 2018

*Palembang, Province of South Sumatera
Indonesia*

Organized By :



Collaborate With :





FOREWORD FROM GENERAL CHAIR 2nd FIRST 2018 INTERNATIONAL CONFERENCE

Welcome to 2nd FIRST 2018, It is with a great pleasure that we extend our warm welcome to all the participants of the 2nd FIRST 2018 International Conference, Forum in Research, Science, and Technology. This conference is held for second times and organized by State Polytechnic of Sriwijaya. The first conference in the series was held in State Polytechnic of Sriwijaya, Palembang, South Sumatera, Indonesia on October 18-19, 2016. It is a good collaboration of State Polytechnic of Sriwijaya, University of Cologne, University of Sunderland, International Islamic University Malaysia, and Politeknik Seberang Perai Malaysia. The 2nd FIRST 2018 International Conference has attracted 109 participants from 6 countries.

The 2nd FIRST 2018 particularly encouraged research students and developing academics to present and to discuss new and current work in the field of 3 Tracks, including Engineering and Science (Track 1), Computer Science and ICT (Track 2), and Social Science (Track 3). 109 selected papers were presented from 137 peer reviewed paper by reviewers drawn from the scientific committee, external reviewers and editorial board.

Finally, as the General Chair of the Conference, I would like to express my deep appreciation to all members of the Steering Committee, Technical Program Committee, Organizing Committee and Reviewers who have devoted their time and energy for the success of the event.

In the end, I hope you enjoy the conference and the beauty of Palembang.

Dr.Ir. Rusdianasari, M.Si.
General Chair of 2nd FIRST 2018



FOREWORD FROM DIRECTOR OF STATE POLYTECHNIC OF SRIWIJAYA

Dear all participants, welcome to Palembang, Indonesia. It is my great pleasure to have all of you who have come from many parts of the world, to join the 2nd FIRST 2018 International Conference, Forum in Research, Science, and Technology. This conference is initiated and organized by State Polytechnic of Sriwijaya in collaboration with State University of Cologne, University of Sunderland, International Islamic University Malaysia, and Politeknik Seberang Perai Malaysia.

It is also my great pleasure to see that this conference is an effective media to link the researchers from many parts of the world. The theme for the 2nd FIRST 2018 is “Applied Technology for Sustainable Development in Supporting Prosperous Human Existence”. It is expected it will be worthwhile platform for researchers to present their finding in the areas on multidisciplinary of Engineering and Science (Track 1), Computer Science and ICT (Track 2), and Social Science (Track 3). It has also provided an opportunity for the professionals and researchers to learn and share about the latest development and research in those 3 tracks.

Finally, on behalf of the conference committee, I would like to express my gratitude and great appreciation towards all of the authors, reviewers, and participants for the great contribution to ensure the success of this event.

Dr. Ing. Ahmad Taqwa, M.T.
Director of State Polytechnic of Sriwijaya

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RUNDOWN
2nd FIRST 2018 INTERNATIONAL CONFERENCE
(FORUM IN RESEARCH SCIENCE AND TECHNOLOGY)
Horison Ultima Hotel, Palembang, South Sumatera, Indonesia
Tuesday – Wednesday, October 30-31, 2018

TUESDAY, October 30, 2018					
Horison Hotel Ultima, KERINCI Room, 3 rd Floor					
No.	Session	Person in Charge	Time Allotment	Liaison Officer	
1.	Registration	Event Section Committee	07.00 – 07.30	M.Miftakhul Amin, S.Kom., M.Eng	
2.	The Opening Ceremony	Event Section Committee	07.30 – 08.30		
	Tari Tanggai				
	Indonesian National Anthem				
	Do'a				
	Chair Report Speech				
	Speech and Opening Remarks by Director of State Polytechnic of Sriwijaya				
	Souvenirs Gift, Group Photos				
3.	Coffee Break	Event Section Committee	08.35 – 08.45		
PLENARY SESSION					
No.	Keynote Speaker	Affiliation	Time Allotment	Moderator	Liaison Officer
1.	Dr. Ing. Ahmad Taqwa, M.T.	Politenik Negeri Sriwijaya	08.45 – 09.15	Mr. Firdaus, S.T., M.T.	Dr. Eng. Herlambang, M.Kom
2.	Prof. Dr. Rahmat Budiarto	Al Baha University, Saudi Arabia	09.15 – 09.45		
3.	Prof. Dr. Werner Rammensee	Cologne University, Germany	09.45 – 10.15		
4.	Prof. Erry Yulia Tribblas Adesta	International Islamic University, Malaysia	10.15 – 10.45		
5.	Assoc. Prof. Dr. Augustus E. Osseo-Asare	University of Sunderland, United Kingdom	10.45 – 11.15	Dr. Markoni Badri, S.E., M.B.A.	M.Miftakhul Amin, S.Kom., M.Eng
6.	Prof. Badri Munir Sukoco, S.E., MBA.,Ph.D	Universitas Airlangga	11.15 – 11.45		

No.	Invited Speaker	Affiliation	Time Allotment	Moderator	Liaison Officer
1.	Assoc. Prof. Pindo Tutuko, Ph.D.	University of Merdeka Malang	11.45 – 12.30	Dr. Nurul Aryanti	Dr. Eng. Herlambang, M.Kom
2.	Ir. Indra Chandra Setiawan, M.T.	Senior Manager PT. Toyota Motor Manufacturing Indonesia			
3.	Dr. Mohammed Yahya Azahrani	Al Baha University, Saudi Arabia			
Break, Sholat Dzuhur, Lunch			12.30 – 13.15		
PARALEL SESSION					
No.	Theme	Room	Time	Moderator	Articles
1.	TRACK 1 (Electrical Engineering, Mechanical Engineering, Civil Engineering)	ROOM 1 (Leuser)	13.30 – 17.20	Agus Subriyanto, S.T., M.T. / Deris Stiawan, M.T., Ph.D./ Nyayu Latifah Husni, S.T., M.T.	22
2.	TRACK 1 (Industrial Engineering, Energy, Biology, Chemical Engineering)	ROOM 2 (Dempo I)	13.30 – 17.30	Ir. Jaksen M. Amin, M.Si. / Doeslohal Djumrianti, S.E.MIS., Ph.D / Koryati, M.Pd	23
3.	TRACK 1 (Chemical Engineering)	ROOM 3 (Dempo II)	13.30 – 17.20	Anerasari, M.B.Eng., M.Si / Dr. Welly / M.Miftakhul Amin, S.Kom., M.Eng	22
4.	TRACK 2 (Computer Science, , Computer Engineering, Information System, Informatics Management) TRACK 3 (English)	ROOM 4 (Semeru I)	13.30 – 16.40	Ummasyro, S.E. Med.M / Dr. Eng. Herlambang, M. Kom /	18
5.	TRACK 3 (Management Economics, Business Administration, Accounting)	ROOM 5 (Semeru II)	13.30 – 17.40	Dr. Jalaluddin Sayuti / Dr. Periansyah / Dr. Sari Lestari ZR	24

WEDNESDAY, October 31, 2018
Horison Hotel Ultima, GOLDEN Room, 2nd Floor

No.	Session	Person in Charge	Time Allotment	Liaison Officer
1.	Registration	Event Section Committee	07.30 – 08.00	Event Section Committee
No.	Session	Speakers	Time Allotment	Liaison Officer
1.	Materi 1: 7 Things to Do to Publish Your Paper in Accredited & International Journal (IRJBS):	M. Eko Y. Napitupulu M. Ikom	08.00 – 09.00	M.Miftakhul Amin, S.Kom., M.Eng
2.	Cofee Break		09.00 – 09.15	Event Section Committee
3.	Materi 2 : How to Write Reseach Paper	Marieska Verawaty, S.Si., M.Si, Ph.D / Deris Stiawan, M.T., Ph.D	09.15 – 12.30	Nyayu Latifah Husni, S.T., M.T.
4.	Break, Sholat Dzuhur, Lunch		12.30 – 13.30	Event Section Committee
No.	Session	Speakers	Time Allotment	Liaison Officer
1.	Couching Clinic and Workshop Session 1	Couching Clinic and Workshop Team	13.30 – 15.00	Ade Silvia Handayani, S.T., M.T.
2.	Cofee Break		15.15 – 15.30	Event Section Committee
3.	Couching Clinic and Workshop Session 2	Couching Clinic and Workshop Team	15.30 – 16.30	Dr. Sari Lestari ZR
4.	Closing		16.30 – 17.00	Dr. Marieska Lupikawaty

Theme : TRACK 1 (Electrical Engineering, Mechanical Engineering, Civil Engineering)
Room : ROOM 1 (Leuser)
Moderator : Agus Subiyanto, S.T., M.T. / Deris Stiawan, M.T., Ph.D./
Nyayu Latifah Husni, S.T., M.T.
Time : 13.30 – 18.05 WIB
Articles : 22

ID	Time	Title	Authors with affiliation and country
864	13.30 – 13.40	Coffee grouping Control System using TCS3200 Sensor based on XBEE PRO	Sarjana, Emilia Hesti, Sholihin, Halimah Tussyadyah (Politeknik Negeri Sriwijaya)
865	13.40 – 13.50	Mimo Printed Dipole Antenna For WIMAX Network Usage Application	Suzanzefi, Ciksadan, Irawan Hadi, R.A. Halimah Thusyadiyah (Politeknik Negeri Sriwijaya)
1010	13.50 – 14.00	Motion Control Analysis of a Spherical Robot as a Surveillance Robot	Tresna Dewi, Pola Risma, Yurni Oktarina, RD Kusumanto (Politeknik Negeri Sriwijaya)
1030	14.00 – 14.10	Wajanbolic Reflection Antenna For 4G Service in Urban and Sub Urban Areas	Jon Endri, Ade Silvia Handayani, Raudatul Jannah (Politeknik Negeri Sriwijaya)
1082	14.10 – 14.20	Enhancement of Navigation Systems of Mobile Robots in Gas Leakage Searching	Nyayu Latifah Husni (Politeknik Negeri Sriwijaya), Nadya Lukita(Politeknik Negeri Sriwijaya), Masayu Annisah(Politeknik Negeri Sriwijaya), Ade Silvia Hadayani(Politeknik Negeri Sriwijaya), Adella Rialita(Politeknik Negeri Sriwijaya), Siti Nurmaini (Universitas Sriwijaya), Irsyadi Yani (Universitas Sriwijaya),
1126	14.20 – 14.30	Higher Education Role in Supporting Indonesian Government Policy in Developing Renewable Energy	Ahmad Taqwa (Politeknik Negeri Sriwijaya)
1137	14.30 – 14.40	Energy Transfer Provision Based on RF-Radio Frequency as Established Solution of Learning Process Using Laptop and Wireless Projector	Suroso, Sopian Soim, Ade Silvia Handayani, Ahmad Taqwa (Politeknik Negeri Sriwijaya)
1164	14.40 – 14.50	Transmission Performance Analysis of TDMA Radio and MAC Communication of TDMA Protocol in TDMA Radio	Ferry Nando, (Nittan Valve Kabushiki Kaisha, Japan) A. Permatasari (Telecommunication Engineering, Politeknik Negeri Sriwijaya), Lindawati (Telecommunication Engineering, Politeknik Negeri Sriwijaya) , Ade Silvia Handayani (Telecommunication Engineering, Politeknik Negeri Sriwijaya)
921	14.50 – 15.00	Milling Process Prediction Model of Sugarcane Juice Using Artificial Neural Networks (ANN)	Devie Oktarini (Department of Industrial Engineering, University of Tridinanti (UTP), Amrifan Saladin Mohruni (Universitas Sriwijaya), Safian Sharif (Dept. of Materials Manuf. and Ind. Engineering, Universiti Teknologi Malaysia), Muhammad Yanis (Associate Professor in Mechanical Engineering Sriwijaya University), Madagaskar (Indonesia)

1007	15.00 – 15.10	Experimental Study of Low-Rank Coal From South Sumatra used in Humidifier and Flash Dryer	Irwin – Bizzy (Mechanical Engineering Department Sriwijaya University), Riman Sipahutar (Mechanical Engineering Department Sriwijaya University), Eddy Ibrahim (Mining Engineering Department Sriwijaya University), Muhammad Faizal (Chemical Engineering Department Sriwijaya University)
1024	15.10 – 15.20	Investigation of Finite Element Modelling on Thin-Walled Machining of Ti6Al4V using DEFORM-3D	Amrifan Saladin Mohruni (Mechanical engineering Department Faculty of Engineering Sriwijaya University), Muhammad Zahir (Mechanical Engineering Department Sriwijaya University), Muhammad Yanis (Mechanical Engineering Department Sriwijaya University), Safian Sharif (Department of Materials Manufacture and Industrial Engineering Universiti Teknologi Malaysia), Irsyadi Yani (Mechanical Engineering Department Sriwijaya University)
1031	15.20 – 15.30	Optimization of Molding Parameters for a Micro Gear with Taguchi Method	Min-Wen Wang (Mechanical Engineering Department, National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan), Fatahul Arifin (Mechanical Engineering Department, National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan), Thi Truc-Ngan Huynh (Industrial Engineering and Management Department, National Kaohsiung University of Applied Sciences, Kaohsiung, Taiwan)
	15.30 – 15.40		BREAK
1032	15.40 – 15.50	The effect of Air Flow Rate and Ratio between Coal and Coconut Shell on Heat Energy Produced in an Updraft Gassifier	Riman Sipahutar (Mechanical Engineering Department Sriwijaya University), Diah Kusuma Pratiwi (Mechanical Engineering Department, Engineering Faculty, Sriwijaya University), Amir Arifin ((Mechanical Engineering Department, Engineering Faculty, Sriwijaya University), Irwin Bizzy ((Mechanical Engineering Department, Engineering Faculty, Sriwijaya University)
1161	15.50 – 16.00	Toward Real Time IoT Based Paste Monitoring System for Small to Medium Enterprise (SME)	Erry YT Adesta (Department of Manufacturing and Materials Engineering, International Islamic University Malaysia (IIUM), Jalan Gombak, 53100 Kuala Lumpur, Malaysia), I Hilmy (Department of Manufacturing and Materials Engineering, International Islamic University Malaysia (IIUM), Jalan Gombak, 53100 Kuala Lumpur, Malaysia), Avicenna (Department of Manufacturing and Materials Engineering, International Islamic University Malaysia (IIUM), Jalan Gombak, 53100 Kuala Lumpur, Malaysia) and D Agusman (Jurusan TeknikMesin, FakultasTeknik, UniversitasMuhammadiyah Prof. Dr. HAMKA, Jl. Limau 2 KebayoranBaru, Jakarta Selatan, Indonesia)
1163	16.00 – 16.10	Reducing CO ₂ Emissions from Land Transport Sector in Indonesia: Case Study Automobiles Sector	Indra Chandra Setiawan (Department of Mechanical & Industrial Engineering, Faculty of Engineering, GadjahMada University, Indonesia), Indarto (Department of Mechanical & Industrial Engineering, Faculty of Engineering, GadjahMada University, Indonesia), and Deendarlianto (Department of Mechanical & Industrial Engineering, Faculty of Engineering, GadjahMada University, Indonesia)
898	16.10 – 16.20	High Quality Concrete by Using Admixture Superplasticizer and Additional Lime Off	Kosim (Politeknik Negeri Sriwijaya), Raja Marpaung (Politeknik Negeri Sriwijaya), Zainuddin (Politeknik Negeri Sriwijaya), Darma Prabudi (Politeknik Negeri Sriwijaya)
925	16.20 – 16.30	Criteria Analysis, Weight and Priority for Handling Bridges in Kudus District using	Erwin DW Prasetyo (Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Kudus, Jawa Tengah, Indonesia), Mudjiastuti Handajani (Magister Teknik Sipil Universitas Diponegoro Semarang) dan Ismiyati (Magister Teknik Sipil Universitas Diponegoro Semarang).

		AHP and Promethee II methods	
997	16.30 – 16.40	A Scouring Patterns Around Pillars of Sekanak River Bridge	Achmad Syarifudin (Civil Engineering department, Universitas Bina Darma, Palembang), Dewi Sartika (Balai Besar Wilayah Sungai Sumatera VIII, Ministry of Public Works and Housing Settlement, Indonesia)
1022	16.40 – 16.50	Irrigation Maintenance Priority Analysis (Case Study: Irrigation Areas in Salatiga City)	Hendarto Efendi (Public Works and Spatial Planning Department of Salatiga City, Central Java, Indonesia), Sri Sangkawati (Master in Civil Engineering Diponegoro University Semarang, Indonesia), Pranoto Samto Atmodjo (Master in Civil Engineering Diponegoro University Semarang, Indonesia)
1034	16.50 – 17.00	The Influence of Temperature Changes on Performance Latson (AC-WC) Plastic Waste with the Marshall Method	Mahmuda (Civil Engineering Departement, Sriwijaya State Polytechnic,Indonesia), Sumiati (Civil Engineering Departement, Sriwijaya State Polytechnic,Indonesia), Puryanto (Civil Engineering Departement, Sriwijaya State Polytechnic,Indonesia) and M. Prawira. W (Civil Engineering Departement, Sriwijaya State Polytechnic,Indonesia)
1084	17.00 – 17.10	Utilization of Local Material of South Sumatra for Porous Asphalt Type AC-WC to Improve Security Levels of Road and Environmentally Friendly	Amiruddin (State Polytechnic of Sriwijaya, Indonesia), Ibrahim (State Polytechnic of Sriwijaya, Indonesia), I Sulianti (State Polytechnic of Sriwijaya, Indonesia) and Agus Subrianto (State Polytechnic of Sriwijaya, Indonesia)
1162	17.10 – 17.20	Tracing the City Pattern of Netherlands and Indonesia using Depth Calculation and Connectivity	Pindo Tutuko (Department of Architecture, University of Merdeka Malang, Indonesia), Nurhamdoko Bonifacius (Department of Architecture, University of Merdeka Malang, Indonesia), Dani Yuniawan (Department of Industrial Engineering, University of Merdeka Malang, Indonesia) Department of Industrial Engineering, University of Merdeka Malang, Indonesia), Adisti Safrilia (Department of Architecture, University of Merdeka Malang, Indonesia), Nurhamdoko Bonifacius (Department of Architecture, University of Merdeka Malang, Indonesia), Mochamad Rizqi Junianto (Master Program, Department of Architecture, University of Merdeka Malang, Malang 65146, Indonesia), Reynold Johan Aleksander Telsoni (Master Program, Department of Architecture, University of Merdeka Malang, Malang 65146, Indonesia)

Theme : TRACK 1 (Industrial Engineering, Energy, Biology)
Room : ROOM 2 (Dempo I)
Moderator : Ir. Jaksen M. Amin, M.Si. / Doeslohal Djumrianti, S.E.MIS., Ph.D / Koryati, M.Pd
Time : 13.30 – 17.35 WIB
Articles : 23

ID	Time	Title	Authors with affiliation and country
778	13.30 – 13.40	IoT Technology Monitoring, Controlling and Data Logging for ATS on Grid Connected Solar-Wind Hybrid System	Budiman (Applied Master of Renewable Energy Engineering, Renewable Energy Engineering Department, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara Bukit Besar, Palembang, South Sumatera Indonesia 30139), Ahmad Taqwa (Electrical Engineering, Electronics Department, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara Bukit Besar, Palembang, South Sumatera Indonesia 30139), RD.Kusumanto (Electrical Engineering, Electronics Department, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara Bukit Besar, Palembang, South Sumatera Indonesia)
783	13.40 – 13.50	Design of Mini Horizontal Wind Turbine for Low Wind Speed Area	Agum Try Wardhana (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang, 30139, Indonesia) ¹ , Ahmad Taqwa (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, 30139, Indonesia), Tresna Dewi (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, 30139, Indonesia).
877	13.50 – 14.00	A Micro Hydro Pelton Turbine Prototype (Review of the effect of water debit and nozzle angle to rotation and pelton turbine power)	Septa Eka Lesmana (Applied Master of Renewable Energy Engineering, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia), Leila Kalsum (Chemical Engineering Department, Renewable Energy Engineering, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia), and Tri Widagdo (Mechanical Engineering Department, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia).
922	14.00 – 14.10	Optimalization of Antimicrobial Production from Endophytic Fungus Sporothrix sp. LBKURCC43 by Modifying Carbon and Nitrogen Sources of Fermentation Media	Abdul Rohman Wali (Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Riau), Nursyirwani (Department of Marine Sciences, Faculty of Fishery and Marine Sciences, Universitas Riau), Saryono (Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Riau)
929	14.10 – 14.20	Achievement Analysis of One Cylinder Diesel Engine Using Virgin Coconut Oil Biodiesel	Burhan Yuliansyah (Applied Master of Renewable Energy Engineering Politeknik Negeri Sriwijaya, Palembang 30139, Indonesia), Triwidagdo (Mechanical Engineering Department Politeknik Negeri Sriwijaya Palembang 30139,Indonesia), Abuhasan (Chemical Engineering Department Politeknik Negeri Sriwijaya, Palembang 30139, Indonesia)
980	14.20 – 14.30	Optimization of Monocrystalline Solar Panels Using Reflector Scanning Technology	Fiqri Al Faruqi (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang 30139, Indonesia), RD. Kusumanto (Electrical Engineering Department, Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang 30139, Indonesia), and Abu Hasan (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang 30139, Indonesia).
988	14.30 – 14.40	Performance Test of Pelton Micro-Hydro Turbine With The Variations of Nozzle Output Angle, Blades	Echa Okdinata (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Abu Hasan (Chemical Engineering Department, Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Indonesia), and Carlos Sitompul (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Indonesia)

		Number and Water Flow Discharge to Produce The Maximum Output Power	
992	14.40 – 14.50	Minimum Power of Solar Panel Movement in Solar Tracker System Prototype	Aldony Reco Putra (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang Indonesia), RD Kusumanto (Electrical Engineering Department, Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia), and Ahmad Taqwa (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia.)
995	14.50 – 15.00	PLC Application as an Automatic Transfer Switch for On-Grid PV System; Case Study PLTS Jakabaring Palembang	Achmad Kurniawan (Politeknik Negeri Sriwijaya, Palembang, Indonesia), Ahmad Taqwa (Politeknik Negeri Sriwijaya, Palembang, Indonesia), and Yohandri Bow (Politeknik Negeri Sriwijaya, Palembang, Indonesia)
1035	15.00 – 15.10	Automatic Cooling System For Efficiency and Output Enhancement of a Pv System Application in Palembang, Indonesia	Hadli Harahap (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Tresna Dewi (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Rusdianasari (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia)
1053	15.10 – 15.20	Sea Salt Deposition Effect On Output And Efficiency Losses Of The Photovoltaic Installation System; A Case Study In Palembang, South Sumatera	Firdaus Setiawan (Renewable Energy Department, Politeknik Negeri Sriwijaya Palembang, Indonesia), Tresna Dewi (Electro Department, Politeknik Negeri Sriwijaya Palembang, Indonesia) and Syahirman Yusi (Bussiness Administration Department, Politeknik Negeri Sriwijaya Palembang, Indonesia)
1066	15.20 – 15.30	Effects of Direct Glass Film Installation on to Photovoltaic Solar Panel	Hendra Kusuma Negara (Applied Master of Renewable Energy Engineering, PoliteknikNegeriSriwijaya Palembang), RD. Kusumanto (Electrical Engineering Department, PoliteknikNegeriSriwijaya Palembang), Abu Hasan (Chemical Engineering Department, Gajah Mada University)
	15.30 – 15.40		BREAK
1070	15.40 – 15.50	FFA Reduction in A Waste Cooking Oil as A Raw Material For Biodiesel With Activated Coal Ash Adsorbent	Endang Susilowati (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Indonesia), Abu Hasan (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara, Bukit Besar, Palembang), and Aida Syarif (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara, Bukit Besar, Palembang)
1087	15.50 – 16.00	Cooling Effect With Heat Sink Fan to Improve Solar Panel (Photovoltaic) Performance	Efsilon K.A. Fatoni (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya Palembang, Indonesia), Ahmad Taqwa (Electrical Engineering Department Politeknik Negeri Sriwijaya Palembang, Indonesia), Rd. Kusumanto (Electrical Engineering Department Politeknik Negeri Sriwijaya Palembang, Indonesia)
1103	16.00 – 16.10	Effect of Reaction Temperature for Biodiesel Quality Using Microwaves Technology	RA Nurul Moulita (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang), Rusdianasari (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang), and Leila Kalsum (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang)
1105	16.10 – 16.20	The Potential of Microwave in the	Sandhy Yunsari (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Indonesia), Rusdianasari (Chemical

		manufacture of Biodiesel by Using Crude Palm Oil (CPO)	Engineering Department, Politeknik Negeri Sriwijaya, Indonesia), and A. Husaini (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Indonesia)
1116	16.20 – 16.30	Experimental Investigation Scenarios of Partial Shade On The PV (Photovoltaic) Module Application in Palembang, Indonesia	Herdian Wibowo (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Yohandri Bow (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Carlos, RS (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia)
1129	16.30 – 16.40	Community Empowerment at Sri Tiga Village, Sumber Marga Telang Sub-District, Banyuasin Regency, The Province of South Sumatera; Technology for Green Production of Nata De Coco and Swamp Water Filtration	Marieskaverawaty (Biology Department, Faculty of Math and Natural Science, Sriwijaya University, South Sumatera, Indonesia), B. Lakitan (Faculty of Agriculture, Sriwijaya University, South Sumatera, Indonesia) and S.Herlinda (Plant Pest and Disease Department, Faculty of Agriculture, Sriwijaya University, Indonesia)
1130	16.40 – 16.50	Effect of Potential Toxic Cyanobacteria Planktothrix agardhii isolated from A Retention Pond in Palembang to Cyprinus carpio L: A Preliminary Study	R. Wulandari (Biology Department, Faculty of Math and Natural Science, Sriwijaya University, South Sumatera, Indonesia), M. Amalia (Biology Department, Faculty of Math and Natural Science, Sriwijaya University, South Sumatera, Indonesia), R. Aryawati (Marine Department, Faculty of Math and Natural Science, Sriwijaya University, South Sumatera, Indonesia), SA. Hamim (Faculty of Enggineering, University of Indo Global Mandiri, South Sumatera, Indonesia) and M. Verawaty (Biology Department, Faculty of Math and Natural Science, Sriwijaya University, South Sumatera, Indonesia)
1140	16.50 – 17.00	Analysis of Biodiesel Conversion on Raw Material Variation Using Statistical Process Control Method	Winnie Andalia (Department of Industrial Engineering Faculty of Engineering, Universitas Tridinanti, Palembang, 30129, Indonesia), I Pratiwi (Department of Industrial Engineering Faculty of Engineering, Universitas Tridinanti, Palembang, 30129, Indonesia), S Arita (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya, Palembang, 30139, Indonesia)
1141	17.00 – 17.10	Nitrogen Gas Production By Pressure Swing Adsorption (Psa) Method Using Carbon Molecular Sieve (Cms) As Oxygen Adsorption	Agus Manggala (Energy Engineering, Polytechnic State of Sriwijaya), A Zikri (Energy Engineering, Polytechnic State of Sriwijaya), Erlinawati (Energy Engineering, Polytechnic State of Sriwijaya), Sutini PL (Energy Engineering, Polytechnic State of Sriwijaya), M Arifin (Energy Engineering, Polytechnic State of Sriwijaya)
1142	17.10 – 17.20	Hydrogen Storage From The Result Of Reactor Ace (Aluminium Corrosion And Electrolysis) Production By Pysisorption Method	A Zikri (Energy Engineering, Polytechnic State of Sriwijaya), Erlinawati (Energy Engineering, Polytechnic State of Sriwijaya), L Trisnaliani (Energy Engineering, Polytechnic State of Sriwijaya), A Aswan (Energy Engineering, Polytechnic State of Sriwijaya), A Firdausia (Energy Engineering, Polytechnic State of Sriwijaya)
1160	17.20 – 17.30	Effectiveness of Electrocoagulation Method in Processing Integrated Wastewater Using Aluminum and Stainless Steel Electrodes	Rusdianasari (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang), Jaksen (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang), Ahmad Taqwa (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Palembang), Yudi Wijarnako (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Palembang)

Theme : TRACK 1 (Chemical Engineering)
Room : ROOM 3 (Dempo II)
Moderator : Aneasari, M.B.Eng., M.Si / Dr. Welly / M.Miftakhul Amin, S.Kom., M.Eng
Time : 13.30 – 17.20 WIB
Articles : 22

ID	Time	Title	Authors with affiliation and country
899	13.30 – 13.40	Potential of Clay in Coal Mining of Tanjung Enim Area As a Filler on Rubber Compound	Abu Hasan (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia), L Kalsum (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia), , M Yerizam (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia), Robert Junaidi (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia), M Taufik (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia), M Aznury (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia), and Fatria (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia)
900	13.40 – 13.50	Influence The Addition of Lapindo Mud is Calcined to the Quality of Cement Podzoland by Using Electric Furnace	Robert Junaidi (teaching staff Bachelor Degree (D IV) Chemical Engineering State Polytechnic of Sriwijaya), Abu Hasan (teaching staff of Master of Applied Renewable Energy Technique of State Polytechnic of Sriwijaya), dan Mustain Zamhari (teaching staff Bachelor Degree (D IV) Chemical Engineering State Polytechnic of Sriwijaya)
959	13.50 – 14.00	An Analysis Of The Impact Of The Coal Mining Activities On The Condition Of Water Quality In The Coal Mining Areas In South Sumatra	Marhaini (Department of Chemical Engineering, Faculty of Engineering, Muhammadiyah University, Palembang, Indonesia), Legiso (Department of Chemical Engineering, Faculty of Engineering, Muhammadiyah University, Palembang, Indonesia), Heny Juniar (Department of Chemical Engineering, Faculty of Engineering, Muhammadiyah University, Palembang, Indonesia), Mubin (Department of Chemical Engineering, Faculty of Engineering, Muhammadiyah University, Palembang, Indonesia)
1014	14.00 – 14.10	Sodium silicate composite filled by zinc oxide as low resistance thermal grease	Wahyu Jati Kusuma (¹ Department of Chemical Engineering, State Polytechnic of Sriwijaya, Srijaya Negara Street, Palembang 30139, Indonesia), Fadarina (Department of Chemical Engineering, State Polytechnic of Sriwijaya, Srijaya Negara Street, Palembang 30139, Indonesia), and Abu Hasan (¹ Department of Chemical Engineering, State Polytechnic of Sriwijaya, Srijaya Negara Street, Palembang 30139, Indonesia)
1068	14.10 – 14.20	Adsorption Model in Removal of Direct Synthetic Dyes in Aqueous Solution onto Tea Waste	Lia Cundari (Chemical Engineering Department Faculty of Engineering Universitas Sriwijaya Indralaya Indonesia), Bazlina Dawami Afrah (Chemical Engineering Department Faculty of Engineering Universitas Sriwijaya Indralaya Indonesia), Dwi Indah Utami (Chemical Engineering Department Faculty of Engineering Universitas Sriwijaya Indralaya Indonesia), Natra Ilhani Matondang (Chemical Engineering Department Faculty of Engineering Universitas Sriwijaya Indralaya Indonesia)
1071	14.20 – 14.30	Production of Biogas from Artificial Substrates (Oil, Protein and Cellulose) by Indigenous Anaerob Bacteria	Putri Agustriyani, Muhammad Said (Chemical Engineering Department, Faculty of Engineering, Universitas Sriwijaya, Palembang, 30139, Indonesia), Muhammad Faizal (Chemical Engineering Department, Faculty of Engineering, Universitas Sriwijaya, Palembang, 30139, Indonesia), Bazlina Dawami Afrah (Chemical Engineering Department, Faculty of Engineering, Universitas Sriwijaya, Palembang, 30139, Indonesia)
1076	14.30 – 14.40	Mechanical properties of bioplastics product from	Sopiah Zainal (Teknik Kimia, Politeknik Negeri Sriwijaya), Yuniar (Teknik Kimia, Politeknik Negeri Sriwijaya), Martha Aznury (Teknik

		Musa paradisica formatypica concentrate with plasticiser variables	Kimia, Politeknik Negeri Sriwijaya), and Melianti (Teknik Kimia, Politeknik Negeri Sriwijaya)
1077	14.40 – 14.50	Oxygen Adsorption Kinetics Study in PSA (Pressure Swing Adsorber) for Nitrogen Production	Indah Purnamasari (Chemical Engineering Department, State Polytechnic of Sriwijaya), M Yerizam (Chemical Engineering Department, State Polytechnic of Sriwijaya), A Hasan (Chemical Engineering Department, State Polytechnic of Sriwijaya), and R Junaidi (Chemical Engineering Department, State Polytechnic of Sriwijaya)
1078	14.50 – 15.00	Characteristics of Activated Charcoal from Coconut Midribs in Jumputan Waste Adsorption Process	Enggal Nurisman (Chemical Engineering Department Sriwijaya University, Palembang Indonesia), Syaiful (Chemical Engineering Department Sriwijaya University, Palembang Indonesia), Rahmatullah (Chemical Engineering Department Sriwijaya University, Palembang Indonesia)
1089	15.00 – 15.10	Geochemical Organic of Airbenakat Black shale in Berau Areas, Jambi	Putri Dwi Afifah (Sriwijaya University), Budhi Setiawan (Sriwijaya University)
1091	15.10 – 15.20	O-rings material deterioration due to contact with biodiesel blends in a dynamic fuel flow	Leily Nurul Komariah (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya, Palembang, Indonesia), S Arita (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya, Palembang, Indonesia), F Aprianjaya (Energy and Environmental Engineering Laboratory Universitas Sriwijaya, Indralaya Ogan Ilir Indonesia), M G Novaldi (Energy and Environmental Engineering Laboratory Universitas Sriwijaya, Indralaya Ogan Ilir, Indonesia) , M F Fathullah (Energy and Environmental Engineering Laboratory Universitas Sriwijaya, Indralaya Ogan Ilir, Indonesia)
1092	15.20 – 15.30	Mathematics Instructional Package Based on Creative Problem Solving to Improve Additive Reasoning Ability and Creative Thinking Ability	Yulianto Wasiran (Departement of Chemical Engineering. State of Polytechnic Sriwijaya. Jalan Srijaya Negara Bukit Besar. Palembang.Indonesia)
	15.30 – 15.40		BREAK
1097	15.40 – 15.50	Lipid Extraction from Mikroalgae Spirulina Platensis for Raw Materials Biodiesel	Leila Kalsum (Applied Renewable Energy Engineering Study Program, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia), Erwana Dewi (Chemical Engineering Study Program, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia), Elina Margarety (Chemical Engineering Study Program, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia) and Aisyah Suci Ningsih (Chemical Engineering Study Program, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia)
1099	15.50 – 16.00	The Characteristics of Particle Board from Empty Fruit Palm Oil (Elaeis guineensis Jacq) by using an Adhesive of Liquid Guava Rod Bark	Siti Chodijah (Staff Edukatif of Chemical Engineering Department , Polytechnic Negeri Sriwijaya), Erwana Dewi (Staff Edukatif of Chemical Engineering Department , Polytechnic Negeri Sriwijaya) and Jaksen (Staff Edukatif of Chemical Engineering Department , Polytechnic Negeri Sriwijaya)
1100	16.00 – 16.10	Production of Glucose From Waste Bark Acacia Mangium Using Delignification and Chemical Hydrolysis Process	Susila Arita (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya Jl. Raya Prabumulih Indralaya-Palembang-South Sumatra), Fitri Hadiyah (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya Jl. Raya Prabumulih Indralaya-Palembang-South Sumatra) , Rizky Amalia (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya Jl. Raya Prabumulih Indralaya-Palembang-South Sumatra), Elsi Rosmalisa (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya Jl. Raya Prabumulih Indralaya-

			Palembang-South Sumatra)
1107	16.10 – 16.20	Pectin Ekstraktion From Kepok Banana Peels (Musa paradisiaca fomatypica) As Biodegradable Film Plastic	Siti Chodijah (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia), M Husaini (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia), M Zaman (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia) and Hilwatulisan (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia)
1109	16.20 – 16.30	The Effect of Reaction Time and pH on the Modification Process of Sago Starch Oxidation	Yuniar (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia), Elina Margaretty (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia), Fadarina (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia), Aneasari M (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia) and Ida Febriana (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia)
1117	16.30 – 16.40	Treatment of Leachate from Garbage using Electrocoagulation Type MP-P (MonoPolar-Paralel) Methode	Aneasari Meidinariasty (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Rusdianasari (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Yohandri Bow (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Irawan Rusnadi (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia), A. Lutfi Fuadi (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia.)
1125	16.40 – 16.50	Analysis Of Cooler Performance In Supply Air Feed For Nitrogen Production Process Using Pressure Swing Adsorption (PSA) Method	Adi Syakdani (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia), Yohandri Bow (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia), Rusdianasari (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia), and Muhammad Taufik (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia)
1131	16.50 – 17.00	Fuel Production from LDPE and HDPE Plastic Waste	Netty Herawati (Chemical Engineering Department, Faculty of Engineering, Universitas Muhammadiyah Palembang, Indonesia), Mardwita Mardwita (Chemical Engineering Department, Faculty of Engineering, Universitas Muhammadiyah Palembang, Palembang 30263, Indonesia), Eka Sri Yusmartini (Chemical Engineering Department, Faculty of Engineering, Universitas Muhammadiyah Palembang, Indonesia), Robiah Robiah (Chemical Engineering Department, Faculty of Engineering, Universitas Muhammadiyah Palembang Indonesia)
1133	17.00 – 17.10	Effect of Time and Concentration of Sulfuric Acid on Yield Bioethanol Produced In Making Bioethanol from Peat Soil	Kiagus Ahmad Roni (Chemical Engineering Study Program, Engineering Faculty, Muhammadiyah University of Palembang), Merisha Hastarina (Industrial Engineering Study Program, Engineering Faculty, Muhammadiyah University of Palembang), Netty Herawati (Chemical Engineering Study Program, Engineering Faculty, Muhammadiyah University of Palembang)
1138	17.10 – 17.20	Banana Midrib as Substitute for Pulp Production	Fadarin (Jurusan Teknik Kimia, Politeknik Negeri Sriwijaya, Palembang 30139), Mustain Zamhari (Jurusan Teknik Kimia, Politeknik Negeri Sriwijaya, Palembang), Selastia Yuliati (Jurusan Teknik Kimia, Politeknik Negeri Sriwijaya, Palembang), Ibnu Hajar (Jurusan Teknik Kimia, Politeknik Negeri Sriwijaya, Palembang), Wahyu Jati Kusuma (Jurusan Teknik Kimia, Politeknik Negeri Sriwijaya, Palembang)

Theme : Computer Science, Computer Engineering, Information System, Informatics Management, English,
Room : ROOM 4 (Semeru I)
Moderator : Ummasyro, S.E. Med.M / Dr. Eng. Herlambang, M. Kom
Time : 13.30 – 16.40 WIB
Articles : 18

ID	Time	Title	Authors with affiliation and country
785	13.30 – 13.40	Implementation of Customer Relationship Management (CRM) With User Centered Design (UCD) User Satisfaction to Measure E-Library PT. Pupuk Sriwidjaja Palembang	Ali Ibrahim(Research laboratory Entreprenuer Resource Planning Faculty of Computer Science), Dahlia(Department of Information Systems Faculty of Computer Science Sriwijaya University), Derdi Kurniawa(Department of Information Systems Faculty of Computer Science Sriwijaya University), Dini Ayu Lestari(Department of Information Systems Faculty of Computer Science Sriwijaya University), Enky Ratnasari(Department of Information Systems Faculty of Computer Science Sriwijaya University), M.Hengky Setiawan(Department of Information Systems Faculty of Computer Science Sriwijaya University)
1080	13.40 – 13.50	Weather Classification based on Hybrid Cloud Image Using Principal Component Analysis(PCA) and Linear Discriminant Analysis(LDA)	Yulia Hapsari(Master of Informatics Engineering, Universitas Sriwijaya, Palembang, 30139, Indonesia), Syamsuryadi(Department of Informatics, Faculty of Computer Science, Universitas Sriwijaya, Palembang, 30139, Indonesia)
1017	13.50 – 14.00	Implementation of Calibration in Gas Hazardous CO and CO2 in Closed Room Using Fuzzy Logic	Slamet Widodo(Department Polytechnic of Sriwijaya, Sriwaja Negera Street, Bukit Besar, Palembang - Indonesia), M.Miftakhul Amin(Department Polytechnic of Sriwijaya, Sriwaja Negera Street, Bukit Besar, Palembang - Indonesia), A.Bahri Joni M(Department of Polytechnic of Sriwijaya, Sriwaja Negera Street, Bukit Besar, Palembang - Indonesia)
1025	14.00 – 14.10	A Framework of Promoting Government Services Using Social Media: Sudan E-Government Case Study	M. S. Adrees(College of Computer Science and Information Technology, Albaha University, Albaha, Saudi Arabia), O. E. Sheta(College of Computer Science and Information Technology, Albaha University, Albaha, Saudi Arabia), M. K. Omer(College of Computer Science and Information Technology, Albaha University, Albaha, Saudi Arabia), D. Stiawan(Dept. of Computer Engineering, Faculty of Computer Science, Universitas Sriwijaya, Palembang, Indonesia), R. Budiarto(College of Computer Science and Information Technology, Albaha University, Albaha, Saudi Arabia)
989	14.10 – 14.20	Geographic Information System of Health Service Place in Palembang	Arsia Rini(Informatics Management Study Program, Politeknik PalComTech, Palembang, 30129, Indonesia), Heki Aprianto(Informatics Management Study Program, Politeknik PalComTech, Palembang, 30129, Indonesia)
991	14.20 – 14.30	Database Design for Website Service Guide “Waterfall Tour South Sumatera	Meidyan Permata Putri(Information Systems Study Program, STMIK PalComTech Palembang), Hendra Effendi(Informatics Engineering Study Program,STMIK PalComTech Palembang)
1012	14.30 – 14.40	The Small and Medium Enterprise (SME) Promotion Website of Pedado Village	Rezania Agramanisti Azdy(Informatics Study Program, STMIK PalComTech, Indonesia), Febriyanti Darnis (Information System Study Program, STMIK PalComTech, Indonesia)

853	14.40 – 14.50	Advancement Parking Application Using MEAN Stack: A Narrative Review	Dian Nugraha (School of Graduates Studies, Management and Science University, Shah Alam, Selangor Malaysia), Falah Y. H. Ahmed (Faculty of Information Science & Engineering, Management and Science University, Shah Alam, Selangor, Malaysia)
927	14.50 – 15.00	Review of Progress Expert System: to Detect Diseases in Humans, Plants, and Animals	Febria Anjara(Management and Science University, Malaysia), Adam Amril Jaharadak (Management and Science University, Malaysia)
928	15.00 – 15.10	Blended Learning as Instructional Media : A review of The Literature	Nora Listiana(School of Graduate Studies, Management and Science University, University Drive, Seksyen 13,40100 Shah Alam, Selangor, Malaysia), Dr. Adam AmrilJaharadak(School of Graduate Studies, Management and Science University, University Drive, Seksyen 13,40100 Shah Alam, Selangor, Malaysia)
1054	15.10 – 15.20	Quality Control System (QCS) of Tourism Industry Sector in Palembang City	Fatmariyani(Informatics Management, Palcomtech Polytechnic, Palembang,Indonesia), Alan Saputro(Informatics Management, Palcomtech Polytechnic, Palembang,Indonesia)
1065	15.20 – 15.30	The Implementation of Ant Colony Algorithm in Finding The Shortest Travel Route of Palembang Tourism by Android Based	Safira Faizah(Studi Program DIV Informatics Management Informatics Management Department, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar Street, Bukit Lama, Ilir Barat I, Palembang 30139), Leni Novianti, S.Kom., M.Kom.(Studi Program DIV Informatics Management Informatics Management Department, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar Street, Bukit Lama, Ilir Barat I, Palembang 30139), Nita Novita, S.E., M.M.(Studi Program DIV Informatics Management Informatics Management Department, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar Street, Bukit Lama, Ilir Barat I, Palembang 30139) ³
	15.30 – 15.40		BREAK
1106	15.40 – 15.50	The Application of Supply Chain Management (SCM) Methods in Practicum Material Supply in Informatics Management Major, State Polytechnic of Sriwijaya	Sony Oktapriandi S.Kom., M.Kom.(Informatics Management D4 Study Program Informatics Management Major, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar, Bukit Lama, Ilir Barat I, Palembang 30139), Indra Satriadi S.T. M.Kom.(Informatics Management D4 Study Program Informatics Management Major, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar, Bukit Lama, Ilir Barat I, Palembang 30139), Hetty Meileni S.Kom., M.T.(Informatics Management D4 Study Program Informatics Management Major, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar, Bukit Lama, Ilir Barat I, Palembang 30139), Desi Apriyanty S.E., M.Si (Informatics Management D4 Study Program Informatics Management Major, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar, Bukit Lama, Ilir Barat I, Palembang 30139),
1110	15.50 – 16.00	Application of Mapping of The Raskin Aid Using AHP Fuzzy Method based on Geographic Information System	Leni N, S.Kom., M.Kom.(Study Program of Informatics Management Diploma IV Polytechnic of Sriwijaya, Palembang), Isnaini Azro, S.Kom., M.Kom.(Study Program of Computer Engineering Department of Informatics Management, Polytechnic of Sriwijaya, Palembang), Robinson, S.Kom.,M.Kom.(Study Program of Informatics Management Diploma IV Polytechnic of Sriwijaya, Palembang)
1112	16.00 – 16.10	Design of Mobile Campus Sriwijaya State Polytechnic Application for Android	Dewi Irmawati.(Informatics Management of Diploma IV Informatics Management Major, State Polytechnic of Sriwijaya, Palembang), Leni N(), Devi Sartika(Informatics Management of Diploma IV Informatics Management Major, State Polytechnic of Sriwijaya, Palembang), Ienda Meiriska(Informatics Management of Diploma IV Informatics Management Major, State Polytechnic of Sriwijaya, Palembang)

1127	16.10 – 16.20	Application Design for Lecturer Advancement in Sriwijaya State Polytechnic Palembang	Indri Ariyanti(Informatic Management Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia), Delta Khairunnisa(Informatic Management Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia), Nita Novita(), and M. Aris Ganiardi(Informatic Management Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia)
1135	16.20 – 16.30	The Implementation of E-Tourism in South Sumatera Province	Hetty Meileni(Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia), Sony Oktapriandi(Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia), and Desi Apriyanty(Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia)
1155	16.30 – 16.40	Using Microsoft Office: Powerpoints in Making Picture-Strips to Improve Students' Speaking and Writing Skills in ELT	Ida Machdarifah (State Polytechnic of Sriwijaya), Zakaria (State Polytechnic of Sriwijaya)

Theme : TRACK 3 (Economy Management, Administration Business, Accounting)
Room : ROOM 5 (Semeru II)
Moderator : Dr. Jalaluddin Sayuti / Dr. Periansyah / Dr. Sari Lestari ZR
Time : 13.30 – 17.30 WIB
Articles : 23

ID	Time	Title	Authors with affiliation and country
1069	13.30 – 13.40	The Analysis of Commitment, Discipline and Motivation Effects on The Non-Domiciled Civil Servants` Performance in Prabumulih Mayor Office	Dibyantoro L. Suhairi Hazisma.(Lecturers of Business Administration Department - State Polytechnic of Sriwijaya), Jalaluddin Sayuti.(Lecturers of Business Administration Department - State Polytechnic of Sriwijaya), Munparidi(Lecturers of Business Administration Department - State Polytechnic of Sriwijaya)
1072	13.40 – 13.50	The Influence of Training on Lecturer`s Performance at Politeknik Negeri Sriwijaya Palembang	Muhammad Noval, Ida Wahyuningrum ^h Yusniarti, Henny Madora (Management Informatic Department Politeknik Negeri Sriwijaya Jl. Srijaya Negara Bukit Besar-Palembang South Sumatera Indonesia 30139
1108	13.50 – 14.00	Strategic Sustainable Development for A Prosperous Human Existence Through Applied Technological Innovations	Augustus Ernest Osseo-Asare (Senior Lecturer, Strategy and International Management, Sunderland Business School, Faculty of Business, Law and Tourism, University of Sunderland, St Peter`s Way, Sunderland, SR6 ODD, England, United Kingdom.)
1006	14.00 – 14.10	Market Orientation, Environmental Orientation, Characteristics of Individual Entrepreneurs, and Broadscope Information on Performance of Smes in Palembang City Through Entrepreneurship Orientation as Mediated Variable (Case Study: Three Years Established Smes)	Fetty Maretha(Business Administration Major, Sriwijaya State Polytechnic, Palembang, Indonesia), Ahmad Ari Gunawan (Informatics Management Major, Sriwijaya State Polytechnic, Palembang, Indonesia)
1019	14.10 – 14.20	The Revitalization of Indonesian Vocational Education Through The Public - Private Partnership	Delfiazi Puji Lestari (LPDP / BUDI DN Batch 2017 awardee, Lecturer at STIA & P Annisa Dwi Salfarizi Palembang,South Sumatera, Indonesia. Student of doctoral program in Doctor of Public Administration at Diponegoro University Semarang Indonesia)
1095	14.20 – 14.30	The Readiness of Hospitality Service of Drivers Online to Serve International Visitors: A Case Study Go Car and Go Grab in Palembang	Desloehal Djumrianti (Senior Lecturer at Department of Business Administration, State Polytechnic of Sriwijaya, Indonesia), Hanifati(Senior Lecturer at Department of Business Administration, State Polytechnic of Sriwijaya, Indonesia),N Rasyid(Senior Lecturer at Department of Business Administration, State Polytechnic of Sriwijaya, Indonesia), and P Mandiangan(Senior Lecturer at Department of Business Administration, State Polytechnic of

			Sriwijaya, Indonesia)
1114	14.30 – 14.40	The Factors Affecting Students for Choosing The Business Administration Departement as A College in Higher Education	Afrizawati, SE, M.Si (Business Administration State Polytechnic Sriwijaya Palembang Indonesia), Dr. Paisal, SE, M.Si (Business Administration State Polytechnic Sriwijaya Palembang Indonesia) Hendra Sastrawinata, SE, M.M (Business Administration State Polytechnic Sriwijaya Palembang Indonesia)
1120	14.40 – 14.50	Ownership Structure, Corporate Social Responsibility (CSR) Disclosure and Company's Financial Performance	Neneng Miskiyah(Department of business administration, Polytechnic State of Sriwijaya, Indonesia), Hadi Jauhari(Department of business administration, Polytechnic State of Sriwijaya, Indonesia), Sari Lestari Zainal Ridho(Department of business administration, Polytechnic State of Sriwijaya, Indonesia)
990	14.50 – 15.00	Analysis of the Influence of Tourist / Tourism Satisfaction on Competitiveness of Tourism Destination in Palembang Citi	Mutiara Lusiana Annisa (Accounting Study Program, Politeknik PalComTech, Palembang, 30129, Indonesia), Ganda Hutasoit (Accounting Study Program, Politeknik PalComTech, Palembang, 30129, Indonesia)
993	15.00 – 15.10	Multimedia Implementation in Tourism Promotion for Increase Regional Original Revenue by Pagaralam City Government	J Febriantoko(Accounting Study Program, Politeknik Palcomtech, Palembang, Indonesia), Hendra Rotama (Visual Communication Design Study Program, Politeknik Palcomtech, Palembang, Indonesia)
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1104	16.10 – 16.20	Performance of Provincial Government Implementation of Indonesia in Financial Sector	Kuo Keo Pisey(Enterpreneurship Development Institute, CIEDI Cambodia-India, Cambodia), Rita Martini(Department of Accounting, State Polytechnic of Sriwijaya, Palembang, Indonesia), Selviana Chalifah(Department of Accounting, State Polytechnic of Sriwijaya, Palembang, Indonesia), Yuli Antina Aryani(Department of Accounting, State Polytechnic of Sriwijaya, Palembang, Indonesia), Kartika Rachma Sari(Department of Accounting, State Polytechnic of Sriwijaya, Palembang, Indonesia), and Choiruddin Choiruddin(Department of Accounting, State Polytechnic of Sriwijaya, Palembang, Indonesia)
1111	16.20 – 16.30	The Effect of Good Governance and Accrual Accounting on Apparatus Behavior with Supporting Devices as Moderators	Henny Yulsiati, SE, M.Ak.(Lecturer in Accounting Department State Polytechnic of Sriwijaya), Sandrayati, SE, M.Sc., Ak.(Lecturer in Accounting Department State Polytechnic of Sriwijaya), Dra. Susi Ardiani, M.Si.(Lecturer in Accounting Department State Polytechnic of Sriwijaya), Sarikadarwati, SE, M.Sc., Ak., CA(Lecturer in Accounting Department State Polytechnic of Sriwijaya)
1113	16.30 – 16.40	The Quality Of SIMDA BMD and User Satisfaction : Study on The Government of South Sumatera Province	Kartika Rachma Sari(Department of Accounting, Sriwijaya State Polytechnic, Palembang , Indonesia), Zainal Arifin(Department of Accounting, Sriwijaya State Polytechnic, Palembang , Indonesia), Desi Indriasari(Department of Accounting, Sriwijaya State Polytechnic, Palembang , Indonesia) , Choirudin ³ , and Rita Martini(Department of Accounting, Sriwijaya State Polytechnic, Palembang , Indonesia)
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IoT Technology Monitoring, Controlling and Data Logging for ATS on Grid Connected Solar-Wind Hybrid System

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Abstract. Global warming and climate change have been world issue in decades, renewable and green energy technology came as the solutions to overcome it. Renewable energy surely gives many benefits, but one of the disadvantages is harvesting these energy are so depending on climate, weather, seasons and time, therefore hybrid system is one of the solutions of combining these energy to a single system. ATS-Automatic Transfer Switch enclosure can be applied for hybrid photovoltaic (PV) and wind turbine, placing grid ac power and generator set as backup or emergency purposes only. The priority is to use renewable energy as the main power source. Automatic sequential can be programmed into microcontroller for supervision, monitoring and data logging of ATS system by using IoT (Internet Of Things) Technology through GPRS GSM internet gateway. These operations can be performed both locally and remotely using IoT technology for historical analysis of data stored in cloud server.

Keywords—ATS; Hybrid PV-wind turbine; IoT Monitoring, GPRS GSM internet gateway;

1. Introduction

In the spirit of “go green” campaign and in the overcoming global warming and decreasing the danger of carbon monoxide footprints, implementing renewable energy as a solution to this problem gives substantial benefits in many aspects [1], solar energy and wind turbine are very important renewable energy nowadays. They are installed worldwide both on rooftop and desert [2,3]. The hybrid system need to be controlled by microcontroller for ensuring efficient power delivery using smart automatic transfer switch (ATS). IoT technology is applied on this system using web base interface for automation of controlling the power transfer switching remotely as well as monitoring, data logging and analysing [4]. This IoT application protocol interface is “open-source” and now commonly used among engineers.

Implementation and installation of an ATS panel with automatic priority selection capability programmed into the microcontroller by using lowest cost and affordable materials available in common market needs to be exercised.

This kind of ATS arrangement could be a new paradigm of implementing clear and clean energy as priority instead of grid or internal combustion generator energy, The metering enclosure is utilized as portable device for controlling any future renewable energy that can deliver ac or dc voltage.



Internet of Things (IoT) has been widely applied over the past few years [5]. The technology itself gives user a freedom to a free or paid term for the use of the internet cloud memory. IoT is physical things talking to each other which are connected to wired and wireless networks [6] through application programming interface (API). IoT is used not only for the field of consumer electronics and appliances but also in other various fields such as a smart city, healthcare, smart home, smart car, smart grid system, and many other industrial applications [7]. As more and more rooftop hybrid photovoltaic-wind turbine systems are getting integrated into the existing grid, there is a growing need for monitoring [8] of real time power generation to optimize the overall performance and to maintain the grid and output power stability [9].

As part of its research plan development, the European Commission (EC) has well-defined IoT as a cohesive part of the Future Internet (FI) where “things having identities and virtual personalities operating in smart spaces using intelligent interfaces to connect and communicate within social, environmental, and user contexts” [10][11]. Therefore once a system is completely tested, running and uploaded to the IoT cloud, it is become a source of analysis data [12].

2. Methodology of IoT Based System for ATS on Grid Hybrid Solar-Wind System

The conceptual of the system is to control a various power sources from any renewable energy and grid connected power sources and making automatic selection of the power sources in accordance with the priority or sequences coding into microcontroller by using IoT technology based network [13].

The information from the sensors both ac and dc power is converted by analog to digital converter (ADC) using serial communication interface (SCI) [14] then transmitted via the mobile radio network gateway. A GPRS GSM module is used to send data and communicate with remote cloud server. Using user friendly and easily set up Graphical User Interfaces (GUI). The system is then monitored, controlled and data logged for future or instant analysis.

2.1 System Architecture

The project basic system wiring is shown on Figure 1 showing the basic power transfer switching for the integrated hybrid system for this project.

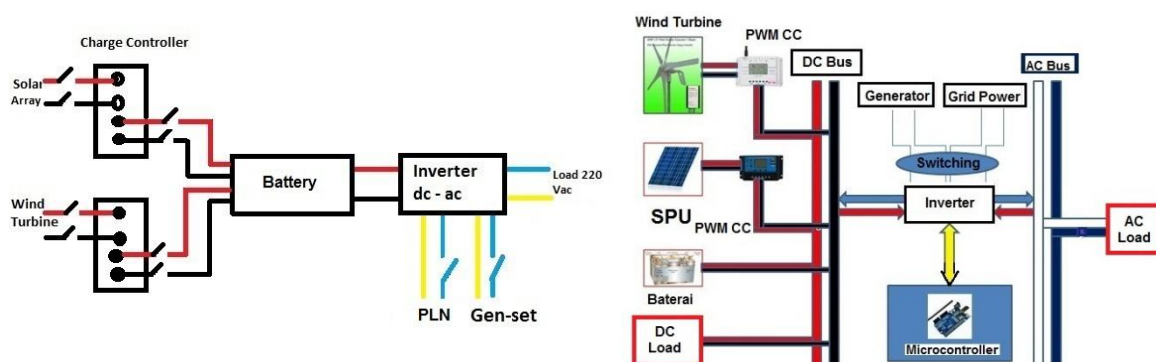


Figure 1. ATS configuration and integrated hybrid power energy system

The basic design of the system can accommodate 5 input power sources to a single system through dc and ac bus, all dc power sources are routed to dc bus. Solar power unit, wind turbine and lead acid battery which has dual functions as power storage or bank and dc power source are connected to dc bus. 2 ac power sources could be supplied from grid and a standby internal combustion engine generator are connected to ac bus [15]. The switching operation as well as power transfer and metering of the power inputs are performed by the microcontroller installed inside the ATS enclosure. The microcontroller uses GPRS GSM SIM800L Module as modem for data and commands to be uploaded to IoT website or cloud server through internet gateway.

2.2 Logic Diagram

The logic diagram programmed into the microcontroller is shown in Figure 3, both SPU and wind turbine output which are expected to be 12 Vdc are pull down using PWM charge controller to dc bus, the “or” gate showing any or both can be parallel to feed the dc bus.

AC voltage source from grid and generator are fed to ac bus as backup power source in the event of the non existence of dc power source to feed the battery as the power storage. This configuration is commonly called automatic power transfer switch or ATS for uninterruptable power supply (UPS).

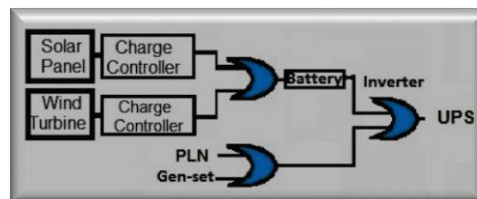


Figure 2. Logic diagram for uninterruptable power output system

The whole systems then compiled and designed in the wiring of the microcontroller as shown in Figure 4 which can be summarized in project implementation flowchart shown in Figure 3. The activities start with understanding equipments or system to be controlled, then logic diagram and sequential priority of the equipments must be set before wiring can be performed on the panel or enclosure. The next phase is procurement process, purchasing and collecting items to built for the microcontroller, sensors, input/output board and type of LCD for the monitoring and status of the system or network. The next step is fabrication the microcontroller as shown on Figure 4, then microcontroller is programmed per logics and sequences as well as MQTT is written for upload and remote IoT system, if this phase does not work then logics and sequences must be reobserved.

If IoT works, then The data collecting and testing considered finish, otherwise c language program need to be rechecked and modified accordingly.

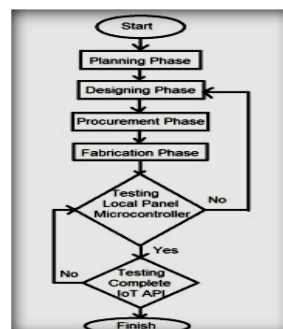


Figure 3. Project implementation flowchart

Figure 4 shows pin to pin and point to point of components used for the complete set of the microcontroller. The printed circuit board (PCB) then designed and fabricated, once this activity is completed, dc power supply can be inserted to its port or terminal, followed by interface cable connection and checking microcontroller card connection to PC. All assigned pins, points, programs, logics, sequences, priority and network assignment can be written and downloaded to microcontroller ATmega328P as the central processing unit of the microcontroller.

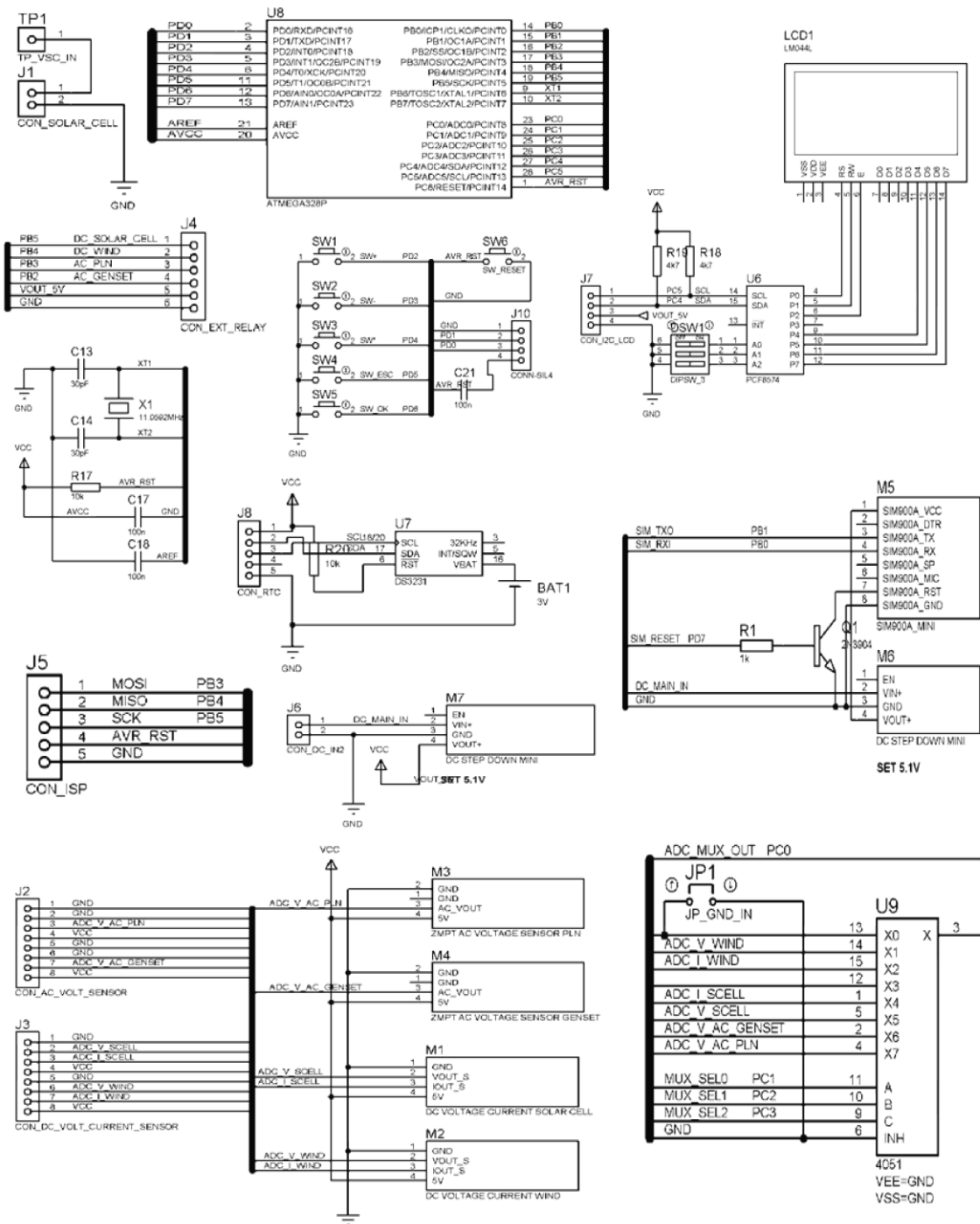


Figure 4. Complete microcontroller wiring diagram

2.3 System Components

System components are composed from several things or components or equipments connected together to perform an operation of giving an uninterruptable power source to a system:

2.3.1 Solar Power Unit (SPU). The solar power unit consists of 4 units custom made mono crystalline (mono si) with the capacity output 250 Wp arranged in parallel connection for more current supply to output source.

The calculation of maximum power point of PV is given by equation:

$$F_1 = V_{MPP} / (V_{OC-STC} \times N_P) \dots\dots\dots (1)$$

$$F_2 = I_{MPP} / (I_{SC-STC} \times N_S) \dots\dots\dots (2)$$

$$F_3 = G_i / 1000 \dots\dots\dots (3)$$

$$F_4 = T_i / 1000 \dots\dots\dots (4)$$

where V_{MPP} is the maximum power point (MPP) voltage, I_{MPP} is the MPP current, V_{OC-STC} and I_{SC-STC} is the open-circuit voltage and short-circuit current of PV array under standard test condition (STC), respectively; N_P is the number of string in parallel of PV array, N_S is the number of module in serial of each string. G_i is the irradiance of PV array, T_i is the temperature of PV array. Hence, the four attributes are F_1 , F_2 , F_3 and F_4 .

Mono crystalline solar cells are made out of silicon ingots, which are cylindrical in shape. To optimize performance and lower costs of a single mono crystalline solar cell production, four sides are cut out of the cylindrical ingots to make silicon wafers [16].

- The advantages of using this SPU are Mono crystalline solar panels have the highest efficiency rates since they are made out of the highest-grade silicon and the efficiency rates of mono crystalline solar panels are typically 15-20% or 15-20% photon flux incident on the cell or sun light energy that can be converted into via photo voltaics into electricity. Mono crystalline silicon solar panels are space-efficient and produce up to four times the amount of electricity as thin-film solar panels. It has the longest life time among other type of solar panels. It is estimated 25 years factory warranty [17].
- The disadvantages of of mono crystalline solar panel are the most expensive from a financial standpoints and mono crystalline solar panels tend to be more efficient in warm weather rather than in cold weather [18].

2.3.2 Inverter. An inverter is used to convert the dc power source mostly 12 Vdc battery (preferably deep-cycle or several batteries wired in parallel to ac power output 220 Vac sine wave with frequency of 50/60Hz. Consequently, the battery then will need to be recharged by running the automobile or a gas generator charger, solar panels, or wind turbine generator. There are two type of common inverters, single and pure sine waver type. Pure sine wave inverter has very low harmonic distortion and clean power like utility-supplied electricity able to handle inductive loads like microwave ovens and motors. running faster, quieter, cooler, and reduced of audible and electrical noise.

2.3.3 Power storage battery. There are 2 types of affordable and low cost rechargeable battery can be used for inverter dc power inputs. The different of automotive and deep cycle battery is the charging time, the deep cycle battery life is longer than automotive battery therefore it takes longer time to have external power to recharge it. Other alternatives is lithium and titanium dioxide rechargeable battery which is estimated to be 20 years in life time can also be applied but it is still very high in market price.

2.3.4 Charge Controller. There are 2 types of battery charge controller commonly found in the market:

- a. Pulse width modulation (PWM) charge controller
- b. Maximum power point tracking (MPPT) charge controller

PWM charge controller is a low cost solution for small system while MPPT has more features for charging purposes allowing SPU operate at their optimum power output voltage by improving up to

30% of their performance. This improvement is done by dropping the charging voltage to battery voltage it causes the increase of current flowing into the battery. PWM charge controller is best used in the moderate temperature between 45°C to 75°C and functionally used to pull down the voltage of PV arrays to battery.

2.3.5 ATS enclosure. PVC enclosure with international standard Ingress Protection (IP) 66 which is dust-proof and water resistance is selected to accommodate automatic transfer switch (ATS) components such as miniature circuit breaker (MCB), analog timer relay, contactor and terminal blocks, as well as the microcontroller and the sensors as shown on Figure 5 and 6. The normally open and close contact of LC1D09M07 contactor are connected to LED lamps indication for ac and dc power input source of the inverter.

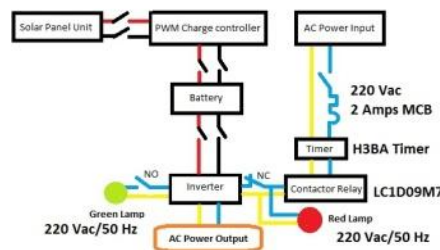


Figure 5. Analog Operation ATS wiring diagram

3. Overall System Design and Data

The main reason for the implementation of this system is the cost effectiveness and the materials are easy to provide, user friendly and easy to assemble. The components are :

- 2 units - ZMPT101B single phase ac voltage current sensor module
- 2 units - DC voltage and current module max 50V, 20A dc
- 1 unit - 4 relay module
- 1 unit - 20 x 4 Sainsmart IIC/12C/TWi Serial 2004 LCD Module shield
- 1 Unit - Custom made microcontroller unit using ATmega328P microcontroller
- 1 Unit - Sim8001 GPRS GSM module

The open source C language software coding are embedded into the microcontroller by using 4 pin serial to USB interface cable. The main part of the controller part is the microcontroller ATmega328P which handle all the logical input-output, processing unit as well as establishing wireless network gateway through internet using sim8001 GPRS module, so that the whole system can be monitored and controlled remotely using any portable devices such as computer, handphone or any tablet devices.

Figure 6 shows all those affordable components, the system is very cost efficient and easy to find in the market but it gives a good performance as ATS, metering, controlling and networking,

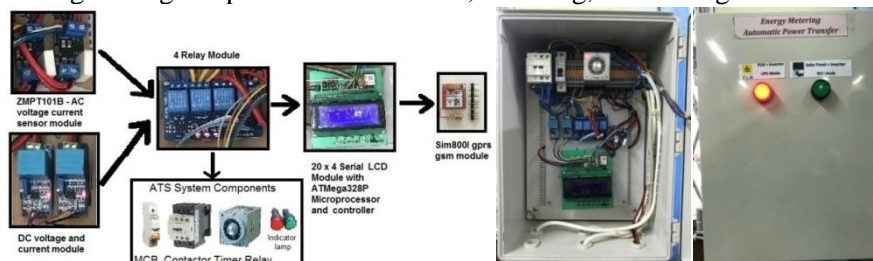


Figure 6. Microcontroller main components and enclosure

The LCD 20 x 4 Sainsmart IIC/12C/TWi Serial 2004 module shield means the LCD is a 4 rows and 20 characters can be displayed in every row.



Figure 7. 20 x 4 LCD Display Unit

Due to unclear screenshot of Figure 7, LCD display shows date, time, power inputs and IoT network status. The c language program coding is kept in ats-v3-03042018.ino file. This program is usually used for arduino or Raspberry Pi microcontroller.

```
ats-v3-03042018 | Arduino 1.8.5
File Edit Sketch Tools Help

ats-v3-03042018

// MQTT details
// https://learn.adafruit.com/adafruit-io/mqtt-api
const char *mqtt_broker = "io.adafruit.com";
const char *mqtt_username = ██████████;
const char *mqtt_password = ██████████;
const uint16_t mqtt_port = 1883;

// subscribe
const char *mqtt_topic_ctrl_mode = ██████████/feeds/ats.ctrl-mode";
const char *mqtt_topic_ac_src = ██████████/feeds/ats.ac-src";

// publish
const char *mqtt_topic_ac_on_src = ██████████/feeds/ats.ac-on-src";
const char *mqtt_topic_i_sc = ██████████/feeds/ats.i-sc";
const char *mqtt_topic_v_sc = ██████████/feeds/ats.v-sc";
const char *mqtt_topic_i_wind = ██████████/feeds/ats.i-wind";
const char *mqtt_topic_v_wind = ██████████/feeds/ats.v-wind";
const char *mqtt_topic_v_pln = ██████████/feeds/ats.v-pln";
```

Figure 8. C Language for application programming interface (API)

As shown on Figure 8, the program is not only embedded to microcontroller ATmega328P but also to IoT website (adafruit.com), this feature can be applied by using sim800i GPRS GSM module which enable the system to communicate with IoT website through its internet gateway. The username and password stored and embedded in c language into the microcontroller will be used once the program is up and running in the IoT server, all data measured by sensors and output activation are then stored in IoT cloud server for historical data logging for analysis purposes.



Figure 9. IoT dashboard and feeds control and monitoring screen and historical graph data logger

The standalone IoT based web hosting running on the target PC or any portable devices enabling the user to monitor the live real time data from anywhere in the world. Log data file on Figure 9 can be accessed and analyzed and gives many information to user about the condition of local sun light condition, clouding, shading SPU cleanliness, power and energy brought down to battery from time to time. The graph itself represents the true value and condition when the system is in operation and it is very easy to be interpreted.

Message queue telemetry transport application protocol interface (MQTT API) is a protocol for device communication that IoT web page. There are 4 important strings to be typed for this purpose, webpage host, port, username and password. The benefit of using IoT is for ELM as the contribution of the development of artificial intelligent (AI), integrate things in minimizing human efforts using various of microcontrollers. Other benefits is the virtualization using user friendly GUI and API, high Speed and messaging is bi-directional connection between things and cloud server, and this cloud server could be the source of endpoint identity, metadata lifecycle states of all devices.

4. Future Work

Another affordable systems can added to give a better performance for future work to this system are:

- a. Installation of MPPT charge controller
- b. Installation of soft starter for 220Vac Output with cut-off relay and capacitor bank
- c. Convenient Portable cart for the panel, inverter and battery
- d. Portable Pneumatic or hydraulic solar panel frame installation with solar tracking

5. Conclusion

IoT Technology enables us to control, monitor and analyze the commands, measurement data from sensors for historical data research in portable, remote and real time mode using any devices with internet connection. The training process of extreme learning machine (ELM) of a microcontroller is fast and simple, and the parameter selection is easy. Web console base can reduce time and improve energy efficiency.

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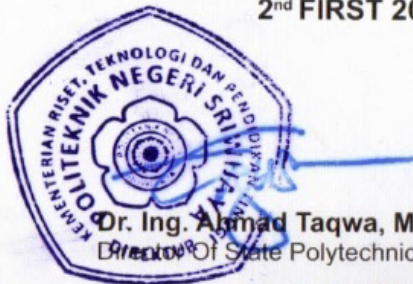
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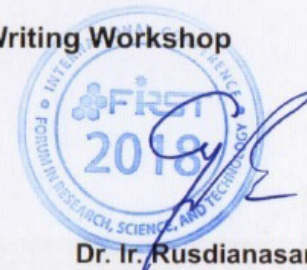
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