Jurnal Rekayasa Elektrika
E-ISSN. 2252-620X
TERAKREDITASI
Kementerian RISTEKDIKTI
No.36b/E/KPT/2016, Tanggal 25 Mei 2016

#15750 Summary

Submission

Authors	Helmy Fitriawan, Roviq Cholifatul Rohman, Herlinawati Herlinawati, Sri Purwiyanti
Title	Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi
Original file	15750-44986-1-SM.DOC 2020-02-04
Supp. files	15750-44988-1-SP.PDF 2020-02-04
Submitter	Dr Helmy Fitriawan
Date submitted	February 4, 2020 - 08:31 PM
Section	Signal and System
Editor	Fitri Arnia
Author comments	Dear Editor, Here, we submit an article entitled "Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi" for possible publication in Jurnal Rekayasa Elektrika. All authors have read and approved the manuscript and take full responsibility for its content. Thank you very much for your attention. Sincerely, Helmy Fitriawan Jurusan Teknik Elektro Fakultas Teknik - Universitas Lampung
Abstract Views	265

Status

Status	Published Vol 16, No 2 (2020)
Initiated	2020-08-12
Last modified	2020-08-25

Submission Metadata

Authors

Name	Helmy Fitriawan
Affiliation	Jurusan Teknik Elektro Universita Lampung
Country	Indonesia
Bio Statement	—

Principal contact for editorial correspondence.

Name	Roviq Cholifatul Rohman
Affiliation	Jurusan Teknik Elektro Universitas Lampung
Country	Indonesia
Bio Statement	—
Name	Herlinawati Herlinawati
Affiliation	Jurusan Teknik Elektro Universitas Lampung
Country	Indonesia
Bio Statement	—
Name	Sri Purwiyanti
Affiliation	Jurusan Teknik Elektro Universitas Lampung
Country	Indonesia
Bio Statement	—

Title and Abstract

Title	Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi
Abstract	In order to get a good performance from a wireless sensor network, it is necessary to measure parameters of the network. RSSI (Received Signal Strength Indicator) is one of the network parameters that measure the signal strength received by a radio receiver in communication module. In this study the RSSI measurement experiment was performed in a wireless sensor network with the ZigBee protocol. Measurements were accomplished in three topologies, i.e. point-to-point, star, and mesh, both indoor and outdoor scenarios. Indoor measurements are carried out within the laboratory with concrete wall partition, while outdoor measurements are carried out in open space with the line-of-sight (LOS) conditions. XCTU software is used to measure RSSI measurements, by sending 100 data packets of 64 bytes with 1 second delivery intervals. Results show that the farther the data transmission distance, the RSSI value relatively decrease due to obstacles and reduced radio signal strength. While, in the mesh topology the addition of a router will also cause a slightly increase in the RSSI value.

Indexing

Keywords	RSSI; zigbee; wireless sensor network; xbee
Language	id

Supporting Agencies

Agencies —

References

References

[1] M. F. Othman and K. Sazali, “Wireless sensor networks applications: A study in environment monitoring system”, in Proc. International Symposium on Robotics and Intelligent Sensors (IRIS 2012), Sep. 2012, pp. 1204-1210.

[2] H. Karl and A. Willig, Protocol and Architectures for Wireless Sensor Networks, John Wiley Sons, 2005.

[3] N. Vikram, K. S. Harish, M. S. Nihaal, R. Umesh, and S. A. A. Kumar, “A low cost home automation system using Wi-fi based wireless sensor network incorporating internet of things (IoT)”, in Proc. IEEE 7th International Advance Computing Conference (IACC 2017), Jul. 2017, pp. 174-178.

[4] J. P. Amezquita-Sanchez, M. Valtierra-Rodriguez, and H. Adeli, “Wireless smart sensors for monitoring the health condition of civil infrastructure,” Scientia Iranica A, vol. 25, no. 6, pp. 29132925, Nov-Dec. 2018.

[5] L. D. Xu, W. He, and S. Li, “Internet of Things in Industries: A survey,” IEEE Trans. Industrial Informatics, vol. 10, no. 4, pp. 2233-2243, Nov. 2014.

[6] T. Ojha, S. Misra, and N. S. Raghuwanshi, “Wireless sensor networks for agriculture: The state-of-the-art in practice and future challenges,” Computer and Electronics in Agriculture, vol. 118, pp. 66-84, Oct. 2015.

[7] H. Alemdar and C. Ersoy, “Wireless sensor networks for healthcare: A survey,” Computer Networks, vol. 54, no. 15, pp. 2688-2710, Oct. 2010.

[8] C. V. K. Mahamuni, “A military surveillance system based on wireless sensor networks with extended covaergae life”, in Proc. International Conference on Global Trends in Signal Processing, Information Computing and Communication (ICG TSPICC 2016), Dec. 2016, pp. 375-381.

[9] IEEE 802.11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications. (2016 revision). IEEE-SA. 14 Dec. 2016.

[10] L. D. Nardis and M. D. Benedetto, “Overview of the IEEE 802.15.4/4a standards for low data rate wireless personal data networks”, in Proc. 4th Workshop on Positioning, Navigation and Navigation (WPNC 2007), Mar. 2007, pp. 285-289.

[11] ZigBee Alliance. “ZigBee and Wireless Radio Frequency Coexistence”, White paper, Jun. 2007.

[12] W. Wang, G. He, and J. Wan, “Research on zigbee wireless communication technology”, in Proc. International Conference on Electrical and Control Engineering (ICECE 2011), Sep. 2011, pp. 1245-1249.

[13] X. C. Heredia, C. H. Barriga, D. I. Piedra, G. D. Oleas, and A. C. Flor, “Monitoring system for intelligent transportation system based in zigbee”, in Proc UNSA International Symposium on Communication (UNSA ISCOMM 2019), Mar. 2019, pp. 1-6.

[14] J. Xuguang, S. Fan, G. Yongxing, T. Shoufeng, and T. Minming, “Zigbee-based wireless gas monitoring sensor alarm system in coal mine”, in Proc 5th International Conference on Advances in Energy Resources and Environmental Engineering (ICAESEE 2019), Dec. 2019, pp. 1-6.

[15] S. G. Varghese, C. P Kurian, V. I. George, A. John, V. Nayak, and A. Upadhyay, “Comparative study of zigbee topologies for IoTbased lighting automation,”IET Wireless Sensor Systems, vol. 9, no. 4, pp. 201-207, Aug. 2019.

[16] Z. Rasin and M. R. Abdullah, “Water quality monitoring system using zigbee based wireless sensor network,” Int. Journal of Engineering & Technology, vol. 9, no. 10, pp. 24-28, May 2012.

[17] Z. K. Hussein, H. J. Hadi, M. R. Abdul-Mutaleb, and Y. S. Mezaal, “Low cost smart weather station using arduino and zigbee,” Telkomnika Telecommunication Computing Electronics and Control, vol. 18, no. 1, pp. 282-288, Feb. 2020.

[18] N. T. Le and W. Benjapolakul, “Received signal strength data of ZigBee technology for on-street environment at 2.4 GHz band and the interruption of vehicle to link quality,” Data in Brief, vol. 22, pp. 1036-1043, Feb. 2019.

[19] D. Yuan, S. S. Kanhere, and M. Hollick, “Instrumenting wireless sensor networks – A survey on the metrics that matter,” Pervasive and Mobile Computing, vol. 37, pp. 45-62, Jun. 2017.

[20] H. H. R. Sherazi, R. Iqbal, S. U. Hasan, M. H. Chaudary, and S. A. Gilani, “ZigBee’s received signal strength and latency evaluation under varying environments,” Journal of Computer Networks and Communciations, vol 2016, pp. 1-8, Jun. 2016.

[21] K. Subaashini, G. Dhivya, and R. Pitchiah, “Zigbee RF signal strength for indoor location sensing - experiments and results”, in Proc. International Conference on Advance Communications Technology (ICACT 2013), Jan. 2013, pp. 50-57.

[22] K. Benkic, M. Malajner, P. Planinsic and Z. Cucei, “Using RSSI value for distance estimation wireless Sensor networks based on Zigbee,” in Proc. 15th International Conference on Systems, Signals and Image Processing (IWSSIP 2008), Aug. 2008, pp. 303-306.

[23] I. N. R. Hendrawan and I. G. N. W. Arsa, “Eksperimen pengukuran parameter RSSI dan troughput protokol ZigBee pada perangkat XBee Seri 2,” Sains dan Teknologi Informasi, vol. 2, no. 2, pp. 13-16, Dec. 2016.

[24] I. N. B. Hartawan and I. G. M. N Desnanjaya, “Analisis kinerja protokol ZigBee di dalam dan di luar ruangan sebagai media komunikasi data pada wireless sensor network,” Jurnal Rekayasa Sistem Komputer, vol. 1, no. 2, pp. 65-72, Oct. 2018.

[25] H H. Fitriawan, D. Mausa, A. S. Arifin, and A. Trisanto, “Realization of Zigbee wireless sensor networks for temperature and humidity monitoring”, in Proc. The International Conference on Electrical Engineering, Computer Science and Informatics (EECSI 2015), Aug. 2015, pp. 102-107.

[26] H. Fitriawan, M. Susanto, A. S. Arifin, D. Mausa, and A. Trisanto, “Zigbee based wireless networks and performance analysis in various environments”, in Proc. The 15th International Conference on Quality in Research (QIR 2017), Aug. 2017, pp. 272-275.

[27] Arduino Uno. [Online]. Available: https://www.arduino.cc/en/main/arduinoBoardUno/. [Accessed October 11, 2018].

[28] LM35DZ Datasheet. “LM35 Precision Centigrade Temperature Sensors”.

[29] Aosong. “DHT Product Manual”.

[30] Digi International Inc. 2014. “Xbee/Xbee-Pro ZB RF Modules Product Manual”.

[31] R. A. Alawi, “RSSI based location estimation in wireless sensor network”. In Proc. 17th IEEE International Conference on Networks (ICON 2011), Dec. 2011, pp. 118-122.

[32] XCTU Tool. [Online] https://www.digi.com/products/embeddedsystems/digi-xbee/digi-xbee-tools/xctu. [Accessed October 13, 2018]

Jurnal Rekayasa Elektrika
E-ISSN. 2252-620X
TERAKREDITASI
Kementerian RISTEKDIKTI
No.36b/E/KPT/2016, Tanggal 25 Mei 2016

#15750 Review

Submission

Authors	Helmy Fitriawan, Roviq Cholifatul Rohman, Herlinawati Herlinawati, Sri Purwiyanti
Title	Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi
Section	Signal and System
Editor	Fitri Arnia

Peer Review

Round 1

Review Version	15750-44990-2-RV.DOC 2020-04-07
Initiated	2020-04-07
Last modified	2020-04-22
Uploaded file	None

Editor Decision

Decision	Accept Submission 2020-05-02
Notify Editor	Editor/Author Email Record 2020-05-21
Editor Version	15750-47577-1-ED.DOC 2020-04-07
Author Version	15750-48515-1-ED.DOC 2020-04-28 DELETE 15750-48515-2-ED.DOCX 2020-05-02 DELETE
Upload Author Version	Choose File No file chosen Upload

Jurnal Rekayasa Elektrika
E-ISSN. 2252-620X
TERAKREDITASI
Kementerian RISTEKDIKTI
No.36b/E/KPT/2016, Tanggal 25 Mei 2016

#15750 Editing

Submission

Authors	Helmy Fitriawan, Roviq Cholifatul Rohman, Herlinawati Herlinawati, Sri Purwiyanti
Title	Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi
Section	Signal and System
Editor	Fitri Arnia

Copyediting

COPYEDIT INSTRUCTIONS

Copyeditor Lili Roslidar

REVIEW METADATA

		REQUEST	UNDERWAY	COMPLETE
1.	Initial Copyedit	2020-05-13	2020-06-13	2020-06-13
	File: 15750-49389-2-CE.DOC 2020-06-13			
2.	Author Copyedit	2020-06-13	2020-06-13	2020-06-24
	File: 15750-51076-1-CE.DOC 2020-06-24			
	Choose File No file chosen Upload			
3.	Final Copyedit	2020-06-24	2020-06-25	2020-07-17
	File: 15750-49389-3-CE.DOC 2020-07-17			

Copyedit Comments No Comments

Layout

Layout Editor Mr. Mohd. Syaryadhi

Layout Version	REQUEST	UNDERWAY	COMPLETE	VIEWS
15750-52196-2-LE.PDF 2020-08-04	2020-08-04	2020-08-04	2020-08-04	
Galley Format	**FILE**			
1. PDF VIEW PROOF	15750-53547-1-PB.PDF 2020-08-22			70
Supplementary Files	**FILE**			
1. Persetujuan Pemindahan Copyright	15750-44988-1-SP.PDF 2020-02-04			

Layout Comments No Comments

Proofreading

REVIEW METADATA

		REQUEST	UNDERWAY	COMPLETE
1.	Author	2020-08-13	2020-08-13	
2.	Proofreader	—	—	—
3.	Layout Editor	—	—	—

Proofreading Corrections No Comments PROOFING INSTRUCTIONS

Editor/Author Correspondence

Editor
2020-04-22 10:52 AM

Subject: [JRE] Editor Decision DELETE

Dr Helmy Fitriawan:

We have reached a decision regarding your submission to Jurnal Rekayasa Elektrika, "Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi".

Our decision is: Revisions Required

Jurnal Rekayasa Elektrika
Syiah Kuala Univeristy
Phone +62 651 7554336
Fax +62 651 7554336
rekayasa.elektrika@unsyiah.net

Reviewer A:

Komentar terhadap artikel:
1. Tambahkan referensi artikel ilmiah paling kurang 50% dari jumlah referensi yang ada, usahakan dari artikel terindeks scopus ataupun paling kurang sinta3
2. denah lokasi indoor untuk setiap topologi perlu dimasukkan
3. Diperlukan sedikit pembahasan secara gabungan dari hasil yg telah didapat selain hanya pengukuran RSSI, untuk meningkatkan kualitas artikel

---

Reviewer B:

Komentar terhadap artikel:
Referensi no [1], terlalu tua. Mohon diganti dengan yang labih baru, kurang dari 10 tahun.

"Hasil penelitian memperlihatkan semakin jauh jarak pengiriman data maka nilai RSSI relatif akan menurun dikarenakan adanya hambatan dan berkurangnya kekuatan sinyal radio". Pernyataan ini sangat umum yang bisa diasumsikan tanpa dilakukan penelitian. Mohon dituliskan kesimpulan yang lebih spesifik.

Kesimpulan juga dibuat lebih spesifik dengan menampilkan angka-angka (menurun sekian persen,... meningkat sekian persen,.. dll) untuk membantu ilustrasi yang dibangun.

---
jre@unsyiah.ac.id
Jurnal Rekayasa Elektrika
http://jurnal.unsyiah.ac.id/JRE

Editor
2020-04-22 10:58 AM

Subject: [JRE] Editor Decision DELETE

Dr Helmy Fitriawan:

We have reached a decision regarding your submission to Jurnal Rekayasa Elektrika, "Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi".

Our decision is: Revisions Required

==========

Please revise the article based on the reviewer's comments, and returned it with the accompanying 'Response to Reviewer Form' (can be downloaded from the JRE site).

We hope we can have the revised article within one week. Thank you.

Jurnal Rekayasa Elektrika
Syiah Kuala Univeristy
Phone +62 651 7554336
Fax +62 651 7554336
rekayasa.elektrika@unsyiah.net

Reviewer A:

Komentar terhadap artikel:
1. Tambahkan referensi artikel ilmiah paling kurang 50% dari jumlah referensi yang ada, usahakan dari artikel terindeks scopus ataupun paling kurang sinta3
2. denah lokasi indoor untuk setiap topologi perlu dimasukkan
3. Diperlukan sedikit pembahasan secara gabungan dari hasil yg telah didapat selain hanya pengukuran RSSI, untuk meningkatkan kualitas artikel

---

Reviewer B:

Komentar terhadap artikel:
Referensi no [1], terlalu tua. Mohon diganti dengan yang labih baru, kurang dari 10 tahun.

"Hasil penelitian memperlihatkan semakin jauh jarak pengiriman data maka nilai RSSI relatif akan menurun dikarenakan adanya hambatan dan berkurangnya kekuatan sinyal radio". Pernyataan ini sangat umum yang bisa diasumsikan tanpa dilakukan penelitian. Mohon dituliskan kesimpulan yang lebih spesifik.

Kesimpulan juga dibuat lebih spesifik dengan menampilkan angka-angka (menurun sekian persen,... meningkat sekian persen,.. dll) untuk membantu ilustrasi yang dibangun.

---

jre@unsyiah.ac.id
Jurnal Rekayasa Elektrika
http://jurnal.unsyiah.ac.id/JRE

Author
2020-04-28 01:13 PM

Subject: Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi

DELETE

Dear Editor,

We have revised our submission to Jurnal Rekayasa Elektrika, "Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada
Berbagai Topologi" accordig to the reviewer's comments. The revised version of the article has been submitted to JRE site.

Thank you.

Helmy Fitriawan
Jurusan Teknik Elektro - Fakultas Teknik
Universitas Lampung
jre@unsyiah.ac.id
Jurnal Rekayasa Elektrika
http://jurnal.unsyiah.ac.id/JRE

Editor
2020-04-28 04:08 PM

Subject: [JRE] Editor Decision: Please Upload the Response to Reviewer Form

DELETE

Dr Helmy Fitriawan:

We have reached a decision regarding your submission to Jurnal Rekayasa Elektrika, "Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi".

Our decision is: Revisions Required

==========

Please also upload the 'Response to Reviewer Form" which can be downloaded from the left-side banner on the JRE site.

Jurnal Rekayasa Elektrika
Syiah Kuala Univeristy
Phone +62 651 7554336
Fax +62 651 7554336
rekayasa.elektrika@unsyiah.net
jre@unsyiah.ac.id
Jurnal Rekayasa Elektrika
http://jurnal.unsyiah.ac.id/JRE

Author
2020-04-28 04:53 PM

Subject: Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi

DELETE

Dear Editor,

As attached, please find the 'Response to Reviewer Form" as requested.

Thank you,
Helmy Fitriawan
Jurusan Teknik Elektro - Fakultas Teknik
Universitas Lampung
jre@unsyiah.ac.id
Jurnal Rekayasa Elektrika
http://jurnal.unsyiah.ac.id/JRE

Editor
2020-05-02 09:59 PM

Subject: [JRE] Editor Decision: Accept Submission

DELETE

Yth. Dr Helmy Fitriawan:

Selamat!

Submisi Anda pada Jurnal Rekayasa Elektrika, dengan judul "Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi", dinyatakan diterima.

Pada artikel Camera Ready, mohon memperhatikan hal-hal berikut ini:
1. Pastikan bahwa naskah sudah menggunakan template JRE, dan mengikuti Petunjuk Penulisan.

2. Pastikan bahwa pada naskah awal ini, nama penulis dan afiliasi sudah dillengkapi.

3. Pastikan bahwa naskah saudara tidak ada salah ketik dan menggunakan tata bahasa yang memenuhi kaidah Bahasa Indonesia yang baik dan benar.

4. Pastikan bahwa semua gambar, grafik, tabel, dan program listing (jika ada) diberi nomor dan ditunjuk di dalam naskah, serta dijelaskan maknanya.

5. Pastikan bahwa sitasi ada di dalam referensi, dan semua daftar referensi di-sitasi di dalam naskah.

6. Sitasi dan daftar referensi harus menggunakan cara IEEE, dan sitasi harus urut dari nomor [1] dan seterusnya, dan harus sama dengan urutan di daftar referensi.

7. Pada bagian hasil (dan pembahasan) pastikan bahwa ada perbandingan dengan metode/algoritma/framework/hasil dengan paper lain sebelumnya.

8. Penulis disarankan untuk membaca paper-paper di website JRE, dan sangat diharapkan untuk mensitasi paper kami yang sesuai. Lihat arsip paper di halaman JRE berikut: http://jurnal.unsyiah.ac.id/JRE/issue/archive

9. Pastikan bahwa tidak ada pelanggaran etika publikasi dan plagiarisme.

10. Biaya publikasi naskah Anda sebesar Rp. 1.500.000,00 (Satu juta lima ratus ribu rupiah), dapat dikirimkan ke
No. Rekening : 158-00-0123171-1
Atas Nama : Muhammad Irhamsyah
Bank Mandiri KK. Darussalam, Banda Aceh

Salam,
Jurnal Rekayasa Elektrika
Syiah Kuala Univeristy
Phone +62 651 7554336
Fax +62 651 7554336
rekayasa.elektrika@unsyiah.net
jre@unsyiah.ac.id
Jurnal Rekayasa Elektrika
http://jurnal.unsyiah.ac.id/JRE

Author
2020-05-21 09:31 PM

Subject: Pengukuran RSSI Jaringan Sensor Nirkabel DELETE

Berbasis ZigBee pada Berbagai Topologi

HELMY FITRIAWAN
Attachments
9:24 PM (5 minutes ago)
to Jurnal

Dear Editor Jurnal Rekayasa Elektrika,

Kami ucapkan terima kasih atas keputusannya untuk dapat mempublikasikan artikel kami.
Berikut kami sampaikan bukti transfer pembayaran biaya publikasi.
Kemudian selanjutnya di bagian mana kami bisa melihat artikel camera ready nya ?

Salam,

Helmy Fitriawan
Jurusan Teknik Elektro - Fakultas Teknik
Universitas Lampung
jre@unsyiah.ac.id
Jurnal Rekayasa Elektrika
http://jurnal.unsyiah.ac.id/JRE

Author
2020-05-21 09:33 PM

Subject: Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi

DELETE

HELMY FITRIAWAN
Attachments
9:24 PM (5 minutes ago)
to Jurnal

Dear Editor Jurnal Rekayasa Elektrika,

Kami ucapkan terima kasih atas keputusannya untuk dapat mempublikasikan artikel kami.
Berikut kami sampaikan bukti transfer pembayaran biaya publikasi.
Kemudian selanjutnya di bagian mana kami bisa melihat artikel camera ready nya ?

Salam,

Helmy Fitriawan
Jurusan Teknik Elektro - Fakultas Teknik
Universitas Lampung
jre@unsyiah.ac.id
Jurnal Rekayasa Elektrika
http://jurnal.unsyiah.ac.id/JRE

Close