

## DAFTAR PUSTAKA

- Anonim. Parle: *RS485 to Ethernet Converters Transmit RS485 Data over Ethernet*. (Online), (<https://www.perle.com/products/rs485-to-ethernet.shtml>), diakses 20 Mei 2022).
- Accuenergy. 2018. *Acuvim II Series Power Meter User's Manual: V:1.0* Revised October 2018.
- Accuenergy. 2022. *Acuvim II Advanced Power & Energy Meter Datasheet: Version: 1.0.2* Revised March 2022.
- Acromag Incorporated. 2005. *Introduction to Modbus TCP/IP*. Michigan, USA.
- Berchmans, H., Suaib, S., Agustina, I., Panjaitan, R., & Winne. (2015, November). *Panduan Penghematan Energi di Gedung Pemerintahan*.
- Clinton, Rombang Mathew Raphael, Rizal Sengkey. 2019. *Purwarupa Sistem Daftar Pelanggaran Lalulintas Berbasis Mini-Komputer Raspberry Pi*. Jurnal Teknik Elektro dan Komputer, Vol 8, No. 3, pp. 181-192.
- Dinata, I., & Sunanda, W. (2015, Maret). *Implementasi Wireless Monitoring Energi Listrik Berbasis Web Database*. Jurnal Nasional Teknik Elektro, Vol. 4(No. 1, ISSN: 2302 - 2949), 83-88.
- ETSI. (1999). *Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); General aspects of Quality of Service (QoS)*. France: European Telecommunications Standards Institute.
- Fajri, A.F., Suhendi, A. and Fathonah, I.W., 2021. *Rancang Bangun Website Untuk Monitoring Penggunaan Daya Listrik Tiga Fasa Berbasis Power Meter Di Gedung Deli Universitas Telkom*. eProceedings of Engineering, 8(2).
- G. Jakaboczki and E. Adamko. 2015. *Vulnerabilities of Modbus RTU Protocol -a Case Study*. Ann. ORADEA Univ. Fascicle Manag. Technol. Eng., Vol. XXIV (XIV), No. 1.
- Hariyanto, Bambang. 2012. *Esensi-Esensi Bahasa Pemrograman Java: Revisi Keempat*. Bandung: Informatika

- Hidayat, R., Nrrartha, I. A., & Citarsa, I. F. (2020, Agustus). *Rancang Bangun Smart KWh Meter 3 Fasa dengan Komunikasi SMS Gateway*. Dielektrika, Vol. 7(No. 2, [P-ISSN 2086-9487] [E-ISSN 2579- 650x]), 140-148.
- Kurniawan, A., Despa, D., & Komaruddin, M. (2014). *Monitoring Besaran Listrik dari Jarak Jauh pada Jaringan Listrik 3 Fasa Berbasis Single Board Computer BCM2835*. Jurnal Informatika dan Teknik Elektro Terapan, Vol. 2(No 3, ISSN: 2303 - 0577).
- L. Hui, Z. Hao, and P. Daogang. 2012. *Design and Application of Communication Gateway of EPA and MODBUS on Electric Power System*. Energy Procedia, Vol. 17, pp. 286–292.
- Mukhlis, B. (2011, Maret). *Evaluasi Penggunaan Listrik pada Bangunan Gedung di Lingkungan Universitas Tadulako*. Jurnal Ilmiah Forensik, Vol. 1(No. 1), 33-42.
- Nugraha, R.A.S., Arifin, D.M., Satyawan, A.S., Asyasyakuur, M.I., Nufus, N., Santi, N.N.A.M. and Habibi, A., 2021, December. *Pengembangan Software Aplikasi Pendeteksian Objek Berbasis LiDAR (Light Detection and Ranging) (Development of Lidar-Based Object Detection Software)*. In Prosiding Seminar Nasional Sains Teknologi dan Inovasi Indonesia (SENASTINDO) (Vol. 3, pp. 73-82).
- Nurpadmi. 2010. *Studi Tentang Modbus Protokol pada Sistem Kontrol*. Swara Patra Vol. 01, No. 2.
- Permana, A. Yudi. 2019. *Perancangan Sistem Informasi Penjualan Perumahan Menggunakan Metode SDLC Pada PT. Mandiri Land Prosperous Berbasis Mobile*. Jurnal Teknologi Pelita Bangsa, Vol 10, No. 2, pp. 153- 167.
- Ramadhan, A. and Yulianti, B., 2022. *Power Meter Pada Telemetry Scada Di Gardu Induk 150 Kv Untuk Meningkatkan Akurasi Data*. Jurnal Teknologi Industri, 11(1).
- Sardiarinto, S., Sulisty, G.B., Safitri, L.A. and Kiswati, S., 2020. *Aplikasi Sistem Penilaian Perkembangan Anak Pada Pos Paud Abimanyu*. Bianglala Informatika, 8(2), pp.111-116.

- Simbolon, Z. K. (2008). *Real Time Monitoring Besaran Listrik untuk Manajemen Energi Gedung Komersial Berbasis Web*.
- Sofwan, A., Muis, A., & Triatmodjo D, S. (2019, April). *Energi Monitoring Panel Utama Jaringan Distribusi 20KV dengan Penerapan Powermeter Berbasis Website*. Jurnal Penelitian Teknik dan Informatika, Vol. 1(No. 1, ISSN: 2684-8813), 51-62.
- Suswanto, Hadi. 2018. *Perancangan Sistem Monitoring Kubikel 20KV Menggunakan NodeMCU ESP8266 Berbasis Web di PLN Rayon Bandung Utara*. Universitas Sangga Buana YPKP.
- Sutarti, S., Siswanto, S. and Subandi, A., 2018. *Implementasi Dan Analisis QoS (Quality of Service) Pada VoIP (Voice Over Internet Protocol) Berbasis Linux*. PROSISKO: Jurnal Pengembangan Riset dan Observasi Sistem Komputer, 5(2).
- WORK, R.S., 2018. *Analisis QOS (Quality Of Service) Pengukuran Delay, Jitter, Packet Lost Dan Throughput Untuk Mendapatkan Kualitas Kerja Radio Streaming Yang Baik*. Jurnal Teknologi Informasi Dan Komunikasi, 7(2), pp.98-105.
- Yuliansyah, H., Corio, D., Yunmar, R., & Aziz, M. (2018). *Energy Monitoring System Based on Internet of Things Toward Smart Campus in Institut Teknologi Sumatera*. IOP Conf. Series: Earth and Environmental Science 258 (2019) 012008.

## LAMPIRAN

Lampiran I. *History Logging Data PH New Outgoing I 20 Agustus 2022*

| No | From Power Meter           | To Database                | Total Energy (kWh) | Net Energy (kWh) | Total Reactive Energy (kvar) | Net Reactive Energy (kvar) | Apparent Energy (kVAh) | Size Data Terima (bytes) |
|----|----------------------------|----------------------------|--------------------|------------------|------------------------------|----------------------------|------------------------|--------------------------|
| 1  | 2022-08-20 00:19:36.917477 | 2022-08-20 00:19:36.992475 | 1360087.9          | 1360082.3        | 260022.2                     | 260012.6                   | 1447938.0              | 120                      |
| 2  | 2022-08-20 00:39:37.271607 | 2022-08-20 00:39:37.353454 | 1360110.5          | 1360104.9        | 260026.6                     | 260017.0                   | 1447961.9              | 120                      |
| 3  | 2022-08-20 00:59:37.669969 | 2022-08-20 00:59:37.754442 | 1360132.4          | 1360126.8        | 260031.2                     | 260021.6                   | 1447985.2              | 120                      |
| 4  | 2022-08-20 01:19:38.183519 | 2022-08-20 01:19:38.258887 | 1360155.6          | 1360150.0        | 260035.7                     | 260026.1                   | 1448009.7              | 120                      |
| 5  | 2022-08-20 01:39:38.592820 | 2022-08-20 01:39:38.680701 | 1360178.2          | 1360172.6        | 260040.3                     | 260030.7                   | 1448033.7              | 120                      |
| 6  | 2022-08-20 01:59:40.903286 | 2022-08-20 01:59:40.982125 | 1360202.5          | 1360196.9        | 260044.8                     | 260035.2                   | 1448059.5              | 120                      |
| 7  | 2022-08-20 02:19:41.340867 | 2022-08-20 02:19:41.424696 | 1360224.4          | 1360218.8        | 260049.6                     | 260040.0                   | 1448083.0              | 120                      |
| 8  | 2022-08-20 02:39:41.770089 | 2022-08-20 02:39:41.858267 | 1360246.9          | 1360241.3        | 260054.4                     | 260044.8                   | 1448106.9              | 120                      |
| 9  | 2022-08-20 02:59:42.167269 | 2022-08-20 02:59:42.245263 | 1360269.3          | 1360263.7        | 260059.2                     | 260049.6                   | 1448130.9              | 120                      |
| 10 | 2022-08-20 03:19:42.733553 | 2022-08-20 03:19:42.812818 | 1360292.7          | 1360287.1        | 260064.4                     | 260054.8                   | 1448155.9              | 120                      |
| 11 | 2022-08-20 03:39:43.127362 | 2022-08-20 03:39:43.211731 | 1360314.9          | 1360309.3        | 260069.4                     | 260059.8                   | 1448179.8              | 120                      |
| 12 | 2022-08-20 03:59:43.541235 | 2022-08-20 03:59:43.627449 | 1360336.5          | 1360330.9        | 260074.4                     | 260064.8                   | 1448202.9              | 120                      |
| 13 | 2022-08-20 04:19:44.002285 | 2022-08-20 04:19:44.076366 | 1360358.8          | 1360353.2        | 260079.4                     | 260069.8                   | 1448227.0              | 120                      |
| 14 | 2022-08-20 04:39:44.394086 | 2022-08-20 04:39:44.473846 | 1360380.9          | 1360375.3        | 260084.4                     | 260074.8                   | 1448250.5              | 120                      |

| No | From Power Meter           | To Database                | Total Energy (kWh) | Net Energy (kWh) | Total Reactive Energy (kvar) | Net Reactive Energy (kvar) | Apparent Energy (kVAh) | Size Data Terima (bytes) |
|----|----------------------------|----------------------------|--------------------|------------------|------------------------------|----------------------------|------------------------|--------------------------|
| 15 | 2022-08-20 04:59:44.781379 | 2022-08-20 04:59:44.867203 | 1360401.7          | 1360396.1        | 260088.7                     | 260079.1                   | 1448272.8              | 120                      |
| 16 | 2022-08-20 05:19:45.299304 | 2022-08-20 05:19:45.378241 | 1360422.4          | 1360416.8        | 260093.1                     | 260083.5                   | 1448294.8              | 120                      |
| 17 | 2022-08-20 05:39:45.846439 | 2022-08-20 05:39:45.926136 | 1360442.6          | 1360437.0        | 260097.5                     | 260087.9                   | 1448316.5              | 120                      |
| 18 | 2022-08-20 05:59:46.247422 | 2022-08-20 05:59:46.327992 | 1360462.4          | 1360456.8        | 260101.8                     | 260092.2                   | 1448337.7              | 120                      |
| 19 | 2022-08-20 06:19:46.661174 | 2022-08-20 06:19:46.747880 | 1360481.0          | 1360475.4        | 260106                       | 260096.4                   | 1448357.8              | 120                      |
| 20 | 2022-08-20 06:39:47.080210 | 2022-08-20 06:39:47.160182 | 1360499.3          | 1360493.7        | 260110.3                     | 260100.7                   | 1448377.6              | 120                      |
| 21 | 2022-08-20 06:59:47.710506 | 2022-08-20 06:59:47.784518 | 1360516.8          | 1360511.2        | 260114.7                     | 260105.1                   | 1448396.8              | 120                      |
| 22 | 2022-08-20 07:19:48.125026 | 2022-08-20 07:19:48.210484 | 1360535.5          | 1360529.9        | 260118.9                     | 260109.3                   | 1448417.0              | 120                      |
| 23 | 2022-08-20 07:39:48.548217 | 2022-08-20 07:39:48.626881 | 1360555.3          | 1360549.7        | 260122.9                     | 260113.3                   | 1448438.1              | 120                      |
| 24 | 2022-08-20 07:59:48.967150 | 2022-08-20 07:59:49.049186 | 1360575.1          | 1360569.5        | 260126.9                     | 260117.3                   | 1448459.1              | 120                      |
| 25 | 2022-08-20 08:19:49.379800 | 2022-08-20 08:19:49.452208 | 1360595.8          | 1360590.2        | 260131.2                     | 260121.6                   | 1448481.1              | 120                      |
| 26 | 2022-08-20 08:39:49.938752 | 2022-08-20 08:39:50.023856 | 1360617.8          | 1360612.2        | 260135.2                     | 260125.6                   | 1448504.3              | 120                      |
| 27 | 2022-08-20 08:59:50.387568 | 2022-08-20 08:59:50.465573 | 1360640.2          | 1360634.6        | 260140.2                     | 260130.6                   | 1448528.0              | 120                      |
| 28 | 2022-08-20 09:19:50.824521 | 2022-08-20 09:19:50.899104 | 1360663.7          | 1360658.1        | 260144.8                     | 260135.2                   | 1448552.7              | 120                      |
| 29 | 2022-08-20 09:39:51.228675 | 2022-08-20 09:39:51.302552 | 1360686.9          | 1360681.3        | 260149.4                     | 260139.8                   | 1448577.1              | 120                      |
| 30 | 2022-08-20 09:59:51.677321 | 2022-08-20 09:59:51.763563 | 1360711.4          | 1360705.8        | 260153.9                     | 260144.3                   | 1448602.7              | 120                      |
| 31 | 2022-08-20 10:19:53.067032 | 2022-08-20 10:19:53.153840 | 1360735.1          | 1360729.5        | 260158.3                     | 260148.7                   | 1448627.6              | 120                      |
| 32 | 2022-08-20 10:39:53.510297 | 2022-08-20 10:39:53.585868 | 1360759.3          | 1360753.7        | 260162.7                     | 260153.1                   | 1448652.8              | 120                      |

| No | From Power Meter           | To Database                | Total Energy (kWh) | Net Energy (kWh) | Total Reactive Energy (kvar) | Net Reactive Energy (kvar) | Apparent Energy (kVAh) | Size Data Terima (bytes) |
|----|----------------------------|----------------------------|--------------------|------------------|------------------------------|----------------------------|------------------------|--------------------------|
| 33 | 2022-08-20 10:59:53.907555 | 2022-08-20 10:59:53.994187 | 1360783.3          | 1360777.7        | 260167.8                     | 260158.2                   | 1448678.1              | 120                      |
| 34 | 2022-08-20 11:19:54.312512 | 2022-08-20 11:19:54.385619 | 1360808.2          | 1360802.6        | 260172.7                     | 260163.1                   | 1448704.1              | 120                      |
| 35 | 2022-08-20 11:39:54.773405 | 2022-08-20 11:39:54.860017 | 1360834.1          | 1360828.5        | 260177.4                     | 260167.8                   | 1448731.2              | 120                      |
| 36 | 2022-08-20 11:59:55.160418 | 2022-08-20 11:59:55.234766 | 1360859.1          | 1360853.5        | 260182.4                     | 260172.8                   | 1448757.4              | 120                      |
| 37 | 2022-08-20 12:19:55.553813 | 2022-08-20 12:19:55.635636 | 1360884.5          | 1360878.9        | 260187.7                     | 260178.1                   | 1448784.0              | 120                      |
| 38 | 2022-08-20 12:39:55.922192 | 2022-08-20 12:39:56.000258 | 1360911.2          | 1360905.6        | 260193.0                     | 260183.4                   | 1448811.9              | 120                      |
| 39 | 2022-08-20 12:59:56.348575 | 2022-08-20 12:59:56.429659 | 1360936.2          | 1360930.6        | 260198.1                     | 260188.5                   | 1448838.2              | 120                      |
| 40 | 2022-08-20 13:19:56.798899 | 2022-08-20 13:19:56.884596 | 1360962.6          | 1360957.0        | 260203.2                     | 260193.6                   | 1448865.8              | 120                      |
| 41 | 2022-08-20 13:39:57.205379 | 2022-08-20 13:39:57.291968 | 1360990.6          | 1360985.0        | 260207.9                     | 260198.3                   | 1448894.9              | 120                      |
| 42 | 2022-08-20 13:59:57.620187 | 2022-08-20 13:59:57.693697 | 1361018.2          | 1361012.6        | 260212.7                     | 260203.1                   | 1448923.4              | 120                      |
| 43 | 2022-08-20 13:59:57.989424 | 2022-08-20 13:59:58.067454 | 1361048.1          | 1361042.5        | 260217.6                     | 260208.0                   | 1448954.6              | 120                      |
| 44 | 2022-08-20 14:39:58.395450 | 2022-08-20 14:39:58.469801 | 1361079.9          | 1361074.3        | 260222.2                     | 260212.6                   | 1448987.6              | 120                      |
| 45 | 2022-08-20 14:59:58.902312 | 2022-08-20 14:59:58.977662 | 1361110.6          | 1361105.0        | 260226.9                     | 260217.3                   | 1449019.7              | 120                      |
| 46 | 2022-08-20 15:19:59.263590 | 2022-08-20 15:19:59.349281 | 1361140.8          | 1361135.2        | 260231.8                     | 260222.2                   | 1449051.2              | 120                      |
| 47 | 2022-08-20 15:40:59.647628 | 2022-08-20 15:40:59.735635 | 1361171.1          | 1361165.5        | 260236.8                     | 260227.2                   | 1449082.6              | 120                      |
| 48 | 2022-08-20 16:00:00.046999 | 2022-08-20 16:00:00.125875 | 1361199.3          | 1361193.7        | 260241.7                     | 260232.1                   | 1449112.2              | 120                      |
| 49 | 2022-08-20 16:20:00.438827 | 2022-08-20 16:20:00.519685 | 1361226.9          | 1361221.3        | 260246.7                     | 260237.1                   | 1449141.3              | 120                      |
| 50 | 2022-08-20 16:40:00.801910 | 2022-08-20 16:40:00.886917 | 1361253.3          | 1361247.7        | 260252.2                     | 260242.6                   | 1449169.3              | 120                      |

| No | From Power Meter           | To Database                | Total Energy (kWh) | Net Energy (kWh) | Total Reactive Energy (kvar) | Net Reactive Energy (kvar) | Apparent Energy (kVAh) | Size Data Terima (bytes) |
|----|----------------------------|----------------------------|--------------------|------------------|------------------------------|----------------------------|------------------------|--------------------------|
| 51 | 2022-08-20 17:00:01.232313 | 2022-08-20 17:00:01.309749 | 1361277.4          | 1361271.8        | 260257.4                     | 260247.8                   | 1449194.9              | 120                      |
| 52 | 2022-08-20 17:20:01.717899 | 2022-08-20 17:20:01.804907 | 1361301.9          | 1361296.3        | 260262.6                     | 260253.0                   | 1449220.7              | 120                      |
| 53 | 2022-08-20 17:40:02.115318 | 2022-08-20 17:40:02.187495 | 1361324.9          | 1361319.3        | 260267.3                     | 260257.7                   | 1449245.1              | 120                      |
| 54 | 2022-08-20 18:00:02.476019 | 2022-08-20 18:00:02.559839 | 1361348.3          | 1361342.7        | 260271.8                     | 260262.2                   | 1449270.0              | 120                      |
| 55 | 2022-08-20 18:20:02.863696 | 2022-08-20 18:20:02.949862 | 1361373.3          | 1361367.7        | 260275.9                     | 260266.3                   | 1449296.3              | 120                      |
| 56 | 2022-08-20 18:40:03.270837 | 2022-08-20 18:40:03.343925 | 1361398.0          | 1361392.4        | 260280.0                     | 260270.4                   | 1449322.1              | 120                      |
| 57 | 2022-08-20 19:00:03.662873 | 2022-08-20 19:00:03.736649 | 1361423.1          | 1361417.5        | 260284.3                     | 260274.7                   | 1449348.4              | 120                      |
| 58 | 2022-08-20 19:20:04.035959 | 2022-08-20 19:20:04.110243 | 1361447.8          | 1361442.2        | 260288.3                     | 260278.7                   | 1449374.2              | 120                      |
| 59 | 2022-08-20 19:40:04.449930 | 2022-08-20 19:40:04.524936 | 1361472.4          | 1361466.8        | 260292.5                     | 260282.9                   | 1449400.0              | 120                      |
| 60 | 2022-08-20 20:00:04.913430 | 2022-08-20 20:00:04.998229 | 1361498.8          | 1361493.2        | 260296.5                     | 260286.9                   | 1449427.6              | 120                      |
| 61 | 2022-08-20 20:20:05.358302 | 2022-08-20 20:20:05.432991 | 1361523.2          | 1361517.6        | 260300.6                     | 260291.0                   | 1449453.3              | 120                      |
| 62 | 2022-08-20 20:40:05.746102 | 2022-08-20 20:40:05.832770 | 1361547.4          | 1361541.8        | 260304.8                     | 260295.2                   | 1449478.7              | 120                      |
| 63 | 2022-08-20 21:00:06.184760 | 2022-08-20 21:00:06.267647 | 1361571.5          | 1361565.9        | 260308.9                     | 260299.3                   | 1449504.1              | 120                      |
| 64 | 2022-08-20 21:20:06.667781 | 2022-08-20 21:20:06.744479 | 1361594.5          | 1361588.9        | 260313.2                     | 260303.6                   | 1449528.5              | 120                      |
| 65 | 2022-08-20 21:40:07.270252 | 2022-08-20 21:40:07.355761 | 1361618.0          | 1361612.4        | 260317.4                     | 260307.8                   | 1449553.3              | 120                      |
| 66 | 2022-08-20 22:00:07.715957 | 2022-08-20 22:00:07.788664 | 1361640.9          | 1361635.3        | 260321.8                     | 260312.2                   | 1449577.7              | 120                      |
| 67 | 2022-08-20 22:20:08.179383 | 2022-08-20 22:20:08.256178 | 1361664.0          | 1361658.4        | 260326.0                     | 260316.4                   | 1449602.2              | 120                      |
| 68 | 2022-08-20 22:40:08.559635 | 2022-08-20 22:40:08.633851 | 1361686.5          | 1361680.9        | 260330.0                     | 260320.4                   | 1449625.9              | 120                      |

| No | From Power Meter           | To Database                | Total Energy (kWh) | Net Energy (kWh) | Total Reactive Energy (kvar) | Net Reactive Energy (kvar) | Apparent Energy (kVAh) | Size Data Terima (bytes) |
|----|----------------------------|----------------------------|--------------------|------------------|------------------------------|----------------------------|------------------------|--------------------------|
| 69 | 2022-08-20 23:00:08.944702 | 2022-08-20 23:00:09.027955 | 1361709.0          | 1361703.4        | 260334.5                     | 260324.9                   | 1449649.8              | 120                      |
| 70 | 2022-08-20 23:20:09.346690 | 2022-08-20 23:20:09.423331 | 1361731.4          | 1361725.8        | 260338.8                     | 260329.2                   | 1449673.6              | 120                      |
| 71 | 2022-08-20 23:40:09.722953 | 2022-08-20 23:40:09.797843 | 1361753.4          | 1361747.8        | 260343.1                     | 260333.5                   | 1449697.0              | 120                      |

Lampiran II. *History Quality of Service* PH New Outgoing I 20 Agustus 2022

| No | From Power Meter           | To Database                | Size Data Kirim (bytes) | Delay (ms) | Jitter (ms) | Packet Loss | Throughput (kbps) |
|----|----------------------------|----------------------------|-------------------------|------------|-------------|-------------|-------------------|
| 1  | 2022-08-20 00:19:36.917477 | 2022-08-20 00:19:36.992475 | 120                     | 0.624983   | 0.000000    | 0%          | 1.600043          |
| 2  | 2022-08-20 00:39:37.271607 | 2022-08-20 00:39:37.353454 | 120                     | 0.682058   | 0.057075    | 0%          | 1.466150          |
| 3  | 2022-08-20 00:59:37.669969 | 2022-08-20 00:59:37.754442 | 120                     | 0.703942   | 0.021883    | 0%          | 1.420572          |
| 4  | 2022-08-20 01:19:38.183519 | 2022-08-20 01:19:38.258887 | 120                     | 0.628067   | 0.075875    | 0%          | 1.592188          |
| 5  | 2022-08-20 01:39:38.592820 | 2022-08-20 01:39:38.680701 | 120                     | 0.732342   | 0.104275    | 0%          | 1.365483          |
| 6  | 2022-08-20 01:59:40.903286 | 2022-08-20 01:59:40.982125 | 120                     | 0.656992   | 0.075350    | 0%          | 1.522089          |
| 7  | 2022-08-20 02:19:41.340867 | 2022-08-20 02:19:41.424696 | 120                     | 0.698575   | 0.041583    | 0%          | 1.431486          |
| 8  | 2022-08-20 02:39:41.770089 | 2022-08-20 02:39:41.858267 | 120                     | 0.734817   | 0.036242    | 0%          | 1.360884          |
| 9  | 2022-08-20 02:59:42.167269 | 2022-08-20 02:59:42.245263 | 120                     | 0.649950   | 0.084867    | 0%          | 1.538580          |
| 10 | 2022-08-20 03:19:42.733553 | 2022-08-20 03:19:42.812818 | 120                     | 0.660542   | 0.010592    | 0%          | 1.513909          |
| 11 | 2022-08-20 03:39:43.127362 | 2022-08-20 03:39:43.211731 | 120                     | 0.703075   | 0.042533    | 0%          | 1.422323          |
| 12 | 2022-08-20 03:59:43.541235 | 2022-08-20 03:59:43.627449 | 120                     | 0.718450   | 0.015375    | 0%          | 1.391885          |
| 13 | 2022-08-20 04:19:44.002285 | 2022-08-20 04:19:44.076366 | 120                     | 0.617342   | 0.101108    | 0%          | 1.619849          |
| 14 | 2022-08-20 04:39:44.394086 | 2022-08-20 04:39:44.473846 | 120                     | 0.664667   | 0.047325    | 0%          | 1.504514          |
| 15 | 2022-08-20 04:59:44.781379 | 2022-08-20 04:59:44.867203 | 120                     | 0.715200   | 0.050533    | 0%          | 1.398210          |
| 16 | 2022-08-20 05:19:45.299304 | 2022-08-20 05:19:45.378241 | 120                     | 0.657808   | 0.057392    | 0%          | 1.520200          |
| 17 | 2022-08-20 05:39:45.846439 | 2022-08-20 05:39:45.926136 | 120                     | 0.664142   | 0.006333    | 0%          | 1.505703          |
| 18 | 2022-08-20 05:59:46.247422 | 2022-08-20 05:59:46.327992 | 120                     | 0.671417   | 0.007275    | 0%          | 1.489388          |

| No | From Power Meter           | To Database                | Size Data Kirim<br>(bytes) | Delay (ms) | Jitter (ms) | Packet Loss | Throughput (kbps) |
|----|----------------------------|----------------------------|----------------------------|------------|-------------|-------------|-------------------|
| 19 | 2022-08-20 06:19:46.661174 | 2022-08-20 06:19:46.747880 | 120                        | 0.722550   | 0.051133    | 0%          | 1.383987          |
| 20 | 2022-08-20 06:39:47.080210 | 2022-08-20 06:39:47.160182 | 120                        | 0.666433   | 0.056117    | 0%          | 1.500525          |
| 21 | 2022-08-20 06:59:47.710506 | 2022-08-20 06:59:47.784518 | 120                        | 0.616767   | 0.049667    | 0%          | 1.621359          |
| 22 | 2022-08-20 07:19:48.125026 | 2022-08-20 07:19:48.210484 | 120                        | 0.712150   | 0.095383    | 0%          | 1.404199          |
| 23 | 2022-08-20 07:39:48.548217 | 2022-08-20 07:39:48.626881 | 120                        | 0.655533   | 0.056617    | 0%          | 1.525475          |
| 24 | 2022-08-20 07:59:48.967150 | 2022-08-20 07:59:49.049186 | 120                        | 0.683633   | 0.028100    | 0%          | 1.462772          |
| 25 | 2022-08-20 08:19:49.379800 | 2022-08-20 08:19:49.452208 | 120                        | 0.603400   | 0.080233    | 0%          | 1.657275          |
| 26 | 2022-08-20 08:39:49.938752 | 2022-08-20 08:39:50.023856 | 120                        | 0.709200   | 0.105800    | 0%          | 1.410039          |
| 27 | 2022-08-20 08:59:50.387568 | 2022-08-20 08:59:50.465573 | 120                        | 0.650042   | 0.059158    | 0%          | 1.538363          |
| 28 | 2022-08-20 09:19:50.824521 | 2022-08-20 09:19:50.899104 | 120                        | 0.621525   | 0.028517    | 0%          | 1.608946          |
| 29 | 2022-08-20 09:39:51.228675 | 2022-08-20 09:39:51.302552 | 120                        | 0.615642   | 0.005883    | 0%          | 1.624322          |
| 30 | 2022-08-20 09:59:51.677321 | 2022-08-20 09:59:51.763563 | 120                        | 0.718683   | 0.103042    | 0%          | 1.391433          |
| 31 | 2022-08-20 10:19:53.067032 | 2022-08-20 10:19:53.153840 | 120                        | 0.723400   | 0.004717    | 0%          | 1.382361          |
| 32 | 2022-08-20 10:39:53.510297 | 2022-08-20 10:39:53.585868 | 120                        | 0.629758   | 0.093642    | 0%          | 1.587911          |
| 33 | 2022-08-20 10:59:53.907555 | 2022-08-20 10:59:53.994187 | 120                        | 0.721933   | 0.092175    | 0%          | 1.385169          |
| 34 | 2022-08-20 11:19:54.312512 | 2022-08-20 11:19:54.385619 | 120                        | 0.609225   | 0.112708    | 0%          | 1.641430          |
| 35 | 2022-08-20 11:39:54.773405 | 2022-08-20 11:39:54.860017 | 120                        | 0.721767   | 0.112542    | 0%          | 1.385489          |
| 36 | 2022-08-20 11:59:55.160418 | 2022-08-20 11:59:55.234766 | 120                        | 0.619567   | 0.102200    | 0%          | 1.614031          |
| 37 | 2022-08-20 12:19:55.553813 | 2022-08-20 12:19:55.635636 | 120                        | 0.681858   | 0.062292    | 0%          | 1.466580          |

| No | From Power Meter           | To Database                | Size Data Kirim<br>(bytes) | Delay (ms) | Jitter (ms) | Packet Loss | Throughput (kbps) |
|----|----------------------------|----------------------------|----------------------------|------------|-------------|-------------|-------------------|
| 38 | 2022-08-20 12:39:55.922192 | 2022-08-20 12:39:56.000258 | 120                        | 0.650550   | 0.031308    | 0%          | 1.537161          |
| 39 | 2022-08-20 12:59:56.348575 | 2022-08-20 12:59:56.429659 | 120                        | 0.675700   | 0.025150    | 0%          | 1.479947          |
| 40 | 2022-08-20 13:19:56.798899 | 2022-08-20 13:19:56.884596 | 120                        | 0.714142   | 0.038442    | 0%          | 1.400282          |
| 41 | 2022-08-20 13:39:57.205379 | 2022-08-20 13:39:57.291968 | 120                        | 0.721575   | 0.007433    | 0%          | 1.385857          |
| 42 | 2022-08-20 13:59:57.620187 | 2022-08-20 13:59:57.693697 | 120                        | 0.612583   | 0.108992    | 0%          | 1.632431          |
| 43 | 2022-08-20 13:59:57.989424 | 2022-08-20 13:59:58.067454 | 120                        | 0.650250   | 0.037667    | 0%          | 1.537870          |
| 44 | 2022-08-20 14:39:58.395450 | 2022-08-20 14:39:58.469801 | 120                        | 0.619592   | 0.030658    | 0%          | 1.613966          |
| 45 | 2022-08-20 14:59:58.902312 | 2022-08-20 14:59:58.977662 | 120                        | 0.627917   | 0.008325    | 0%          | 1.592568          |
| 46 | 2022-08-20 15:19:59.263590 | 2022-08-20 15:19:59.349281 | 120                        | 0.714092   | 0.086175    | 0%          | 1.400380          |
| 47 | 2022-08-20 15:40:59.647628 | 2022-08-20 15:40:59.735635 | 120                        | 0.733392   | 0.019300    | 0%          | 1.363528          |
| 48 | 2022-08-20 16:00:00.046999 | 2022-08-20 16:00:00.125875 | 120                        | 0.657300   | 0.076092    | 0%          | 1.521375          |
| 49 | 2022-08-20 16:20:00.438827 | 2022-08-20 16:20:00.519685 | 120                        | 0.673817   | 0.016517    | 0%          | 1.484083          |
| 50 | 2022-08-20 16:40:00.801910 | 2022-08-20 16:40:00.886917 | 120                        | 0.708392   | 0.034575    | 0%          | 1.411648          |
| 51 | 2022-08-20 17:00:01.232313 | 2022-08-20 17:00:01.309749 | 120                        | 0.645300   | 0.063092    | 0%          | 1.549667          |
| 52 | 2022-08-20 17:20:01.717899 | 2022-08-20 17:20:01.804907 | 120                        | 0.725067   | 0.079767    | 0%          | 1.379184          |
| 53 | 2022-08-20 17:40:02.115318 | 2022-08-20 17:40:02.187495 | 120                        | 0.601475   | 0.123592    | 0%          | 1.662579          |
| 54 | 2022-08-20 18:00:02.476019 | 2022-08-20 18:00:02.559839 | 120                        | 0.698500   | 0.097025    | 0%          | 1.431639          |
| 55 | 2022-08-20 18:20:02.863696 | 2022-08-20 18:20:02.949862 | 120                        | 0.718050   | 0.019550    | 0%          | 1.392661          |
| 56 | 2022-08-20 18:40:03.270837 | 2022-08-20 18:40:03.343925 | 120                        | 0.609067   | 0.108983    | 0%          | 1.641856          |

| No        | From Power Meter           | To Database                | Size Data Kirim<br>(bytes) | Delay (ms) | Jitter (ms) | Packet Loss | Throughput (kbps) |
|-----------|----------------------------|----------------------------|----------------------------|------------|-------------|-------------|-------------------|
| 57        | 2022-08-20 19:00:03.662873 | 2022-08-20 19:00:03.736649 | 120                        | 0.614800   | 0.005733    | 0%          | 1.626545          |
| 58        | 2022-08-20 19:20:04.035959 | 2022-08-20 19:20:04.110243 | 120                        | 0.619033   | 0.004233    | 0%          | 1.615422          |
| 59        | 2022-08-20 19:40:04.449930 | 2022-08-20 19:40:04.524936 | 120                        | 0.625050   | 0.006017    | 0%          | 1.599872          |
| 60        | 2022-08-20 20:00:04.913430 | 2022-08-20 20:00:04.998229 | 120                        | 0.706658   | 0.081608    | 0%          | 1.415111          |
| 61        | 2022-08-20 20:20:05.358302 | 2022-08-20 20:20:05.432991 | 120                        | 0.622408   | 0.084250    | 0%          | 1.606662          |
| 62        | 2022-08-20 20:40:05.746102 | 2022-08-20 20:40:05.832770 | 120                        | 0.722233   | 0.099825    | 0%          | 1.384594          |
| 63        | 2022-08-20 21:00:06.184760 | 2022-08-20 21:00:06.267647 | 120                        | 0.690725   | 0.031508    | 0%          | 1.447754          |
| 64        | 2022-08-20 21:20:06.667781 | 2022-08-20 21:20:06.744479 | 120                        | 0.639150   | 0.051575    | 0%          | 1.564578          |
| 65        | 2022-08-20 21:40:07.270252 | 2022-08-20 21:40:07.355761 | 120                        | 0.712575   | 0.073425    | 0%          | 1.403361          |
| 66        | 2022-08-20 22:00:07.715957 | 2022-08-20 22:00:07.788664 | 120                        | 0.605892   | 0.106683    | 0%          | 1.650460          |
| 67        | 2022-08-20 22:20:08.179383 | 2022-08-20 22:20:08.256178 | 120                        | 0.639958   | 0.034067    | 0%          | 1.562602          |
| 68        | 2022-08-20 22:40:08.559635 | 2022-08-20 22:40:08.633851 | 120                        | 0.618467   | 0.021492    | 0%          | 1.616902          |
| 69        | 2022-08-20 23:00:08.944702 | 2022-08-20 23:00:09.027955 | 120                        | 0.693775   | 0.075308    | 0%          | 1.441389          |
| 70        | 2022-08-20 23:20:09.346690 | 2022-08-20 23:20:09.423331 | 120                        | 0.638675   | 0.055100    | 0%          | 1.565742          |
| 71        | 2022-08-20 23:40:09.722953 | 2022-08-20 23:40:09.797843 | 120                        | 0.624083   | 0.014592    | 0%          | 1.602350          |
| Total     |                            |                            |                            | 47.397675  | 3.893600    | 0%          | 106.777151        |
| Rata-rata |                            |                            |                            | 0.667573   | 0.05839     | 0%          | 1.503904          |

Lampiran III. *History Logging Data PH New Outgoing II 20 Agustus 2022*

| No | From Power Meter           | To Database                | Total Energy (kWh) | Net Energy (kWh) | Total Reactive Energy (kvar) | Net Reactive Energy (kvar) | Apparent Energy (kVAh) | Size Data Terima (bytes) |
|----|----------------------------|----------------------------|--------------------|------------------|------------------------------|----------------------------|------------------------|--------------------------|
| 1  | 2022-08-20 00:19:37.092176 | 2022-08-20 00:19:37.177631 | 5107519.5          | 5037104.3        | 2129198.0                    | 526505.0                   | 6653836.8              | 120                      |
| 2  | 2022-08-20 00:39:37.484485 | 2022-08-20 00:39:37.558755 | 5107599.1          | 5037183.9        | 2129216.7                    | 526486.3                   | 6653928.1              | 120                      |
| 3  | 2022-08-20 00:59:37.994610 | 2022-08-20 00:59:38.069207 | 5107680.3          | 5037265.1        | 2129235.5                    | 526467.5                   | 6654021.2              | 120                      |
| 4  | 2022-08-20 01:19:38.376325 | 2022-08-20 01:19:38.460195 | 5107757.2          | 5037342.0        | 2129254.2                    | 526448.8                   | 6654109.9              | 120                      |
| 5  | 2022-08-20 01:39:38.791396 | 2022-08-20 01:39:38.867592 | 5107833.5          | 5037418.3        | 2129272.9                    | 526430.1                   | 6654197.8              | 120                      |
| 6  | 2022-08-20 01:59:41.157191 | 2022-08-20 01:59:41.230311 | 5107915.2          | 5037500.0        | 2129291.8                    | 526411.2                   | 6654291.8              | 120                      |
| 7  | 2022-08-20 02:19:41.568320 | 2022-08-20 02:19:41.642857 | 5107990.9          | 5037575.7        | 2129310.6                    | 526392.4                   | 6654379.1              | 120                      |
| 8  | 2022-08-20 02:39:41.970352 | 2022-08-20 02:39:42.043476 | 5108077.5          | 5037661.7        | 2129330.0                    | 526373.0                   | 6654497.9              | 120                      |
| 9  | 2022-08-20 02:59:42.544955 | 2022-08-20 02:59:42.619418 | 5108212.0          | 5037795.6        | 2129350.1                    | 526352.9                   | 6654664.4              | 120                      |
| 10 | 2022-08-20 03:19:42.937584 | 2022-08-20 03:19:43.014401 | 5108371.9          | 5037954.5        | 2129370.6                    | 526332.4                   | 6654858.6              | 120                      |
| 11 | 2022-08-20 03:39:43.327922 | 2022-08-20 03:39:43.411713 | 5108516.3          | 5038096.7        | 2129390.8                    | 526312.2                   | 6655036.2              | 120                      |
| 12 | 2022-08-20 03:59:43.764941 | 2022-08-20 03:59:43.843802 | 5108653.8          | 5038232.0        | 2129410.8                    | 526292.2                   | 6655206.1              | 120                      |
| 13 | 2022-08-20 04:19:44.189364 | 2022-08-20 04:19:44.264943 | 5108805.5          | 5038380.9        | 2129431.2                    | 526271.8                   | 6655392.8              | 120                      |
| 14 | 2022-08-20 04:39:44.600964 | 2022-08-20 04:39:44.676246 | 5108933.9          | 5038509.1        | 2129450.9                    | 526252.1                   | 6655546.5              | 120                      |
| 15 | 2022-08-20 04:59:45.117072 | 2022-08-20 04:59:45.190460 | 5109020.3          | 5038595.5        | 2129469.8                    | 526233.2                   | 6655652.0              | 120                      |
| 16 | 2022-08-20 05:19:45.485424 | 2022-08-20 05:19:45.561927 | 5109103.9          | 5038679.1        | 2129488.7                    | 526214.3                   | 6655755.4              | 120                      |
| 17 | 2022-08-20 05:39:46.038786 | 2022-08-20 05:39:46.114156 | 5109189.4          | 5038763.6        | 2129507.8                    | 526195.2                   | 6655863.3              | 120                      |

| No | From Power Meter           | To Database                | Total Energy (kWh) | Net Energy (kWh) | Total Reactive Energy (kvar) | Net Reactive Energy (kvar) | Apparent Energy (kVAh) | Size Data Terima (bytes) |
|----|----------------------------|----------------------------|--------------------|------------------|------------------------------|----------------------------|------------------------|--------------------------|
| 18 | 2022-08-20 05:59:46.457404 | 2022-08-20 05:59:46.530484 | 5109336.4          | 5038905.8        | 2129527.9                    | 526175.1                   | 6656046.8              | 120                      |
| 19 | 2022-08-20 06:19:46.879288 | 2022-08-20 06:19:46.966270 | 5109475.9          | 5039041.5        | 2129548.0                    | 526155.0                   | 6656223.7              | 120                      |
| 20 | 2022-08-20 06:39:47.422245 | 2022-08-20 06:39:47.502066 | 5109604.2          | 5039163.4        | 2129568.0                    | 526135.0                   | 6656390.5              | 120                      |
| 21 | 2022-08-20 06:59:47.936834 | 2022-08-20 06:59:48.016891 | 5109744.8          | 5039291.6        | 2129588.3                    | 526114.7                   | 6656570.6              | 120                      |
| 22 | 2022-08-20 07:19:48.342610 | 2022-08-20 07:19:48.428574 | 5109879.1          | 5039417.7        | 2129608.5                    | 526094.5                   | 6656743.1              | 120                      |
| 23 | 2022-08-20 07:39:48.741485 | 2022-08-20 07:39:48.826466 | 5110013.1          | 5039540.3        | 2129628.6                    | 526074.4                   | 6656916.3              | 120                      |
| 24 | 2022-08-20 07:59:49.193529 | 2022-08-20 07:59:49.279846 | 5110149.7          | 5039662.9        | 2129648.3                    | 526054.7                   | 6657092.1              | 120                      |
| 25 | 2022-08-20 08:19:49.732554 | 2022-08-20 08:19:49.810811 | 5110240.4          | 5039751.6        | 2129667.4                    | 526035.6                   | 6657207.9              | 120                      |
| 26 | 2022-08-20 08:39:50.154026 | 2022-08-20 08:39:50.227680 | 5110369.1          | 5039871.3        | 2129687.2                    | 526015.8                   | 6657375.1              | 120                      |
| 27 | 2022-08-20 08:59:50.608849 | 2022-08-20 08:59:50.684518 | 5110500.8          | 5039983.8        | 2129707.0                    | 525996.0                   | 6657543.8              | 120                      |
| 28 | 2022-08-20 09:19:51.027735 | 2022-08-20 09:19:51.101466 | 5110626.0          | 5040093.6        | 2129726.7                    | 525976.3                   | 6657708.4              | 120                      |
| 29 | 2022-08-20 09:39:51.452035 | 2022-08-20 09:39:51.533982 | 5110746.5          | 5040202.1        | 2129746.2                    | 525956.8                   | 6657868.2              | 120                      |
| 30 | 2022-08-20 09:59:51.861972 | 2022-08-20 09:59:51.948133 | 5110864.1          | 5040310.1        | 2129765.7                    | 525937.3                   | 6658025.7              | 120                      |
| 31 | 2022-08-20 10:19:53.319732 | 2022-08-20 10:19:53.399904 | 5110985.5          | 5040422.5        | 2129784.9                    | 525918.1                   | 6658184.3              | 120                      |
| 32 | 2022-08-20 10:39:53.700299 | 2022-08-20 10:39:53.789302 | 5111123.8          | 5040544.8        | 2129804.5                    | 525898.5                   | 6658361.7              | 120                      |
| 33 | 2022-08-20 10:59:54.128530 | 2022-08-20 10:59:54.212108 | 5111243.1          | 5040659.9        | 2129824.2                    | 525878.8                   | 6658515.7              | 120                      |
| 34 | 2022-08-20 11:19:54.504764 | 2022-08-20 11:19:54.588256 | 5111343.7          | 5040759.9        | 2129843.8                    | 525859.2                   | 6658648.5              | 120                      |
| 35 | 2022-08-20 11:39:54.979065 | 2022-08-20 11:39:55.063736 | 5111431.9          | 5040847.7        | 2129863.2                    | 525839.8                   | 6658766.9              | 120                      |

| No | From Power Meter           | To Database                | Total Energy (kWh) | Net Energy (kWh) | Total Reactive Energy (kvar) | Net Reactive Energy (kvar) | Apparent Energy (kVAh) | Size Data Terima (bytes) |
|----|----------------------------|----------------------------|--------------------|------------------|------------------------------|----------------------------|------------------------|--------------------------|
| 36 | 2022-08-20 11:59:55.364351 | 2022-08-20 11:59:55.452686 | 5111546.4          | 5040961.0        | 2129883.1                    | 525819.9                   | 6658914.8              | 120                      |
| 37 | 2022-08-20 12:19:55.744680 | 2022-08-20 12:19:55.825109 | 5111629.5          | 5041042.5        | 2129902.5                    | 525800.5                   | 6659021.6              | 120                      |
| 38 | 2022-08-20 12:39:56.158673 | 2022-08-20 12:39:56.232282 | 5111693.4          | 5041106.4        | 2129921.2                    | 525781.8                   | 6659102.5              | 120                      |
| 39 | 2022-08-20 12:59:56.549225 | 2022-08-20 12:59:56.633211 | 5111742.9          | 5041155.9        | 2129939.6                    | 525763.4                   | 6659163.9              | 120                      |
| 40 | 2022-08-20 13:19:57.002853 | 2022-08-20 13:19:57.084420 | 5111838.0          | 5041250.2        | 2129959.0                    | 525744.0                   | 6659280.6              | 120                      |
| 41 | 2022-08-20 13:39:57.421839 | 2022-08-20 13:39:57.507863 | 5111943.9          | 5041356.1        | 2129978.6                    | 525724.4                   | 6659409.7              | 120                      |
| 42 | 2022-08-20 13:59:57.813294 | 2022-08-20 13:59:57.895870 | 5112042.8          | 5041453.8        | 2129998.1                    | 525704.9                   | 6659531.8              | 120                      |
| 43 | 2022-08-20 14:19:58.196888 | 2022-08-20 14:19:58.269485 | 5112129.6          | 5041540.6        | 2130017.1                    | 525685.9                   | 6659633.0              | 120                      |
| 44 | 2022-08-20 14:39:58.706071 | 2022-08-20 14:39:58.783474 | 5112208.4          | 5041619.4        | 2130035.9                    | 525667.1                   | 6659724.5              | 120                      |
| 45 | 2022-08-20 14:59:59.082196 | 2022-08-20 14:59:59.162974 | 5112281.6          | 5041692.6        | 2130054.8                    | 525648.2                   | 6659810.3              | 120                      |
| 46 | 2022-08-20 15:19:59.453925 | 2022-08-20 15:19:59.537248 | 5112347.7          | 5041758.7        | 2130073.5                    | 525629.5                   | 6659888.8              | 120                      |
| 47 | 2022-08-20 15:40:59.867645 | 2022-08-20 15:40:59.955916 | 5112429.4          | 5041840.4        | 2130092.5                    | 525610.5                   | 6659983.7              | 120                      |
| 48 | 2022-08-20 16:00:00.255084 | 2022-08-20 16:00:00.343309 | 5112501.8          | 5041912.8        | 2130111.4                    | 525591.6                   | 6660068.9              | 120                      |
| 49 | 2022-08-20 16:20:00.633693 | 2022-08-20 16:20:00.709699 | 5112566.7          | 5041977.7        | 2130130.2                    | 525572.8                   | 6660146.6              | 120                      |
| 50 | 2022-08-20 16:40:00.991925 | 2022-08-20 16:40:01.077933 | 5112638.0          | 5042049.0        | 2130149.1                    | 525553.9                   | 6660231.1              | 120                      |
| 51 | 2022-08-20 17:00:01.550769 | 2022-08-20 17:00:01.627774 | 5112707.9          | 5042118.9        | 2130168.0                    | 525535.0                   | 6660314.5              | 120                      |
| 52 | 2022-08-20 17:20:01.914915 | 2022-08-20 17:20:01.994055 | 5112778.1          | 5042189.1        | 2130186.6                    | 525516.4                   | 6660397.7              | 120                      |
| 53 | 2022-08-20 17:40:02.289794 | 2022-08-20 17:40:02.373306 | 5112856.8          | 5042267.8        | 2130205.6                    | 525497.4                   | 6660490.6              | 120                      |

| No | From Power Meter           | To Database                | Total Energy (kWh) | Net Energy (kWh) | Total Reactive Energy (kvar) | Net Reactive Energy (kvar) | Apparent Energy (kVAh) | Size Data Terima (bytes) |
|----|----------------------------|----------------------------|--------------------|------------------|------------------------------|----------------------------|------------------------|--------------------------|
| 54 | 2022-08-20 18:00:02.661139 | 2022-08-20 18:00:02.746330 | 5112932.2          | 5042343.2        | 2130224.5                    | 525478.5                   | 6660580.5              | 120                      |
| 55 | 2022-08-20 18:20:03.052859 | 2022-08-20 18:20:03.136751 | 5112990.7          | 5042401.7        | 2130242.9                    | 525460.1                   | 6660650.1              | 120                      |
| 56 | 2022-08-20 18:40:03.464177 | 2022-08-20 18:40:03.547237 | 5113054.5          | 5042465.5        | 2130261.2                    | 525441.8                   | 6660724.0              | 120                      |
| 57 | 2022-08-20 19:00:03.849001 | 2022-08-20 19:00:03.922084 | 5113117.6          | 5042528.6        | 2130279.5                    | 525423.5                   | 6660797.4              | 120                      |
| 58 | 2022-08-20 19:20:04.214319 | 2022-08-20 19:20:04.297032 | 5113208.9          | 5042619.9        | 2130298.6                    | 525404.4                   | 6660900.7              | 120                      |
| 59 | 2022-08-20 19:40:04.719728 | 2022-08-20 19:40:04.805535 | 5113319.4          | 5042730.4        | 2130318.0                    | 525385.0                   | 6661024.0              | 120                      |
| 60 | 2022-08-20 20:00:05.118287 | 2022-08-20 20:00:05.199544 | 5113424.3          | 5042835.3        | 2130337.3                    | 525365.7                   | 6661141.3              | 120                      |
| 61 | 2022-08-20 20:20:05.561685 | 2022-08-20 20:20:05.636499 | 5113516.3          | 5042927.3        | 2130356.5                    | 525346.5                   | 6661244.9              | 120                      |
| 62 | 2022-08-20 20:40:05.979117 | 2022-08-20 20:40:06.066361 | 5113599.7          | 5043010.7        | 2130375.5                    | 525327.5                   | 6661338.9              | 120                      |
| 63 | 2022-08-20 21:00:06.409711 | 2022-08-20 21:00:06.484650 | 5113689.3          | 5043100.3        | 2130394.6                    | 525308.4                   | 6661439.5              | 120                      |
| 64 | 2022-08-20 21:20:06.978179 | 2022-08-20 21:20:07.054260 | 5113796.2          | 5043207.2        | 2130414.1                    | 525288.9                   | 6661558.0              | 120                      |
| 65 | 2022-08-20 21:40:07.543192 | 2022-08-20 21:40:07.616367 | 5113892.1          | 5043303.1        | 2130433.3                    | 525269.7                   | 6661664.7              | 120                      |
| 66 | 2022-08-20 22:00:07.972428 | 2022-08-20 22:00:08.052670 | 5113980.3          | 5043391.3        | 2130452.4                    | 525250.6                   | 6661763.2              | 120                      |
| 67 | 2022-08-20 22:20:08.368955 | 2022-08-20 22:20:08.457122 | 5114061.1          | 5043472.1        | 2130471.4                    | 525231.6                   | 6661853.6              | 120                      |
| 68 | 2022-08-20 22:40:08.752935 | 2022-08-20 22:40:08.837009 | 5114147.1          | 5043558.1        | 2130490.2                    | 525212.8                   | 6661949.4              | 120                      |
| 69 | 2022-08-20 23:00:09.152533 | 2022-08-20 23:00:09.230008 | 5114235.2          | 5043646.2        | 2130509.2                    | 525193.8                   | 6662047.9              | 120                      |
| 70 | 2022-08-20 23:20:09.550957 | 2022-08-20 23:20:09.624069 | 5114331.0          | 5043742.0        | 2130528.4                    | 525174.6                   | 6662155.0              | 120                      |
| 71 | 2022-08-20 23:40:09.922923 | 2022-08-20 23:40:10.000930 | 5114410.1          | 5043821.1        | 2130547.3                    | 525155.7                   | 6662244.0              | 120                      |

Lampiran IV. *History Quality of Service* PH New Outgoing II 20 Agustus 2022

| No | From Power Meter           | To Database                | Size Data Kirim (bytes) | Delay (ms) | Jitter (ms) | Packet Loss | Throughput (kbps) |
|----|----------------------------|----------------------------|-------------------------|------------|-------------|-------------|-------------------|
| 1  | 2022-08-20 00:19:37.092176 | 2022-08-20 00:19:37.177631 | 120                     | 0.712125   | 0.000000    | 0%          | 1.404248          |
| 2  | 2022-08-20 00:39:37.484485 | 2022-08-20 00:39:37.558755 | 120                     | 0.618917   | 0.093208    | 0%          | 1.615726          |
| 3  | 2022-08-20 00:59:37.994610 | 2022-08-20 00:59:38.069207 | 120                     | 0.621642   | 0.002725    | 0%          | 1.608644          |
| 4  | 2022-08-20 01:19:38.376325 | 2022-08-20 01:19:38.460195 | 120                     | 0.698917   | 0.077275    | 0%          | 1.430786          |
| 5  | 2022-08-20 01:39:38.791396 | 2022-08-20 01:39:38.867592 | 120                     | 0.634967   | 0.063950    | 0%          | 1.574886          |
| 6  | 2022-08-20 01:59:41.157191 | 2022-08-20 01:59:41.230311 | 120                     | 0.609333   | 0.025633    | 0%          | 1.641138          |
| 7  | 2022-08-20 02:19:41.568320 | 2022-08-20 02:19:41.642857 | 120                     | 0.621142   | 0.011808    | 0%          | 1.609939          |
| 8  | 2022-08-20 02:39:41.970352 | 2022-08-20 02:39:42.043476 | 120                     | 0.609367   | 0.011775    | 0%          | 1.641048          |
| 9  | 2022-08-20 02:59:42.544955 | 2022-08-20 02:59:42.619418 | 120                     | 0.620525   | 0.011158    | 0%          | 1.611539          |
| 10 | 2022-08-20 03:19:42.937584 | 2022-08-20 03:19:43.014401 | 120                     | 0.640142   | 0.019617    | 0%          | 1.562154          |
| 11 | 2022-08-20 03:39:43.327922 | 2022-08-20 03:39:43.411713 | 120                     | 0.698258   | 0.058117    | 0%          | 1.432135          |
| 12 | 2022-08-20 03:59:43.764941 | 2022-08-20 03:59:43.843802 | 120                     | 0.657175   | 0.041083    | 0%          | 1.521665          |
| 13 | 2022-08-20 04:19:44.189364 | 2022-08-20 04:19:44.264943 | 120                     | 0.629825   | 0.027350    | 0%          | 1.587743          |
| 14 | 2022-08-20 04:39:44.600964 | 2022-08-20 04:39:44.676246 | 120                     | 0.627350   | 0.002475    | 0%          | 1.594007          |
| 15 | 2022-08-20 04:59:45.117072 | 2022-08-20 04:59:45.190460 | 120                     | 0.611567   | 0.015783    | 0%          | 1.635145          |
| 16 | 2022-08-20 05:19:45.485424 | 2022-08-20 05:19:45.561927 | 120                     | 0.637525   | 0.025958    | 0%          | 1.568566          |
| 17 | 2022-08-20 05:39:46.038786 | 2022-08-20 05:39:46.114156 | 120                     | 0.628083   | 0.009442    | 0%          | 1.592145          |
| 18 | 2022-08-20 05:59:46.457404 | 2022-08-20 05:59:46.530484 | 120                     | 0.609000   | 0.019083    | 0%          | 1.642036          |

| No | From Power Meter           | To Database                | Size Data Kirim<br>(bytes) | Delay (ms) | Jitter (ms) | Packet Loss | Throughput (kbps) |
|----|----------------------------|----------------------------|----------------------------|------------|-------------|-------------|-------------------|
| 19 | 2022-08-20 06:19:46.879288 | 2022-08-20 06:19:46.966270 | 120                        | 0.724850   | 0.115850    | 0%          | 1.379596          |
| 20 | 2022-08-20 06:39:47.422245 | 2022-08-20 06:39:47.502066 | 120                        | 0.665175   | 0.059675    | 0%          | 1.503364          |
| 21 | 2022-08-20 06:59:47.936834 | 2022-08-20 06:59:48.016891 | 120                        | 0.667142   | 0.001967    | 0%          | 1.498932          |
| 22 | 2022-08-20 07:19:48.342610 | 2022-08-20 07:19:48.428574 | 120                        | 0.716367   | 0.049225    | 0%          | 1.395933          |
| 23 | 2022-08-20 07:39:48.741485 | 2022-08-20 07:39:48.826466 | 120                        | 0.708175   | 0.008192    | 0%          | 1.412080          |
| 24 | 2022-08-20 07:59:49.193529 | 2022-08-20 07:59:49.279846 | 120                        | 0.719308   | 0.011133    | 0%          | 1.390224          |
| 25 | 2022-08-20 08:19:49.732554 | 2022-08-20 08:19:49.810811 | 120                        | 0.652142   | 0.067167    | 0%          | 1.533409          |
| 26 | 2022-08-20 08:39:50.154026 | 2022-08-20 08:39:50.227680 | 120                        | 0.613783   | 0.038358    | 0%          | 1.629239          |
| 27 | 2022-08-20 08:59:50.608849 | 2022-08-20 08:59:50.684518 | 120                        | 0.630575   | 0.016792    | 0%          | 1.585854          |
| 28 | 2022-08-20 09:19:51.027735 | 2022-08-20 09:19:51.101466 | 120                        | 0.614425   | 0.016150    | 0%          | 1.627538          |
| 29 | 2022-08-20 09:39:51.452035 | 2022-08-20 09:39:51.533982 | 120                        | 0.682892   | 0.068467    | 0%          | 1.464361          |
| 30 | 2022-08-20 09:59:51.861972 | 2022-08-20 09:59:51.948133 | 120                        | 0.718008   | 0.035117    | 0%          | 1.392741          |
| 31 | 2022-08-20 10:19:53.319732 | 2022-08-20 10:19:53.399904 | 120                        | 0.668100   | 0.049908    | 0%          | 1.496782          |
| 32 | 2022-08-20 10:39:53.700299 | 2022-08-20 10:39:53.789302 | 120                        | 0.741692   | 0.073592    | 0%          | 1.348269          |
| 33 | 2022-08-20 10:59:54.128530 | 2022-08-20 10:59:54.212108 | 120                        | 0.696483   | 0.045208    | 0%          | 1.435785          |
| 34 | 2022-08-20 11:19:54.504764 | 2022-08-20 11:19:54.588256 | 120                        | 0.695767   | 0.000717    | 0%          | 1.437263          |
| 35 | 2022-08-20 11:39:54.979065 | 2022-08-20 11:39:55.063736 | 120                        | 0.705592   | 0.009825    | 0%          | 1.417250          |
| 36 | 2022-08-20 11:59:55.364351 | 2022-08-20 11:59:55.452686 | 120                        | 0.736125   | 0.030533    | 0%          | 1.358465          |
| 37 | 2022-08-20 12:19:55.744680 | 2022-08-20 12:19:55.825109 | 120                        | 0.670242   | 0.065883    | 0%          | 1.491999          |

| No | From Power Meter           | To Database                | Size Data Kirim<br>(bytes) | Delay (ms) | Jitter (ms) | Packet Loss | Throughput (kbps) |
|----|----------------------------|----------------------------|----------------------------|------------|-------------|-------------|-------------------|
| 38 | 2022-08-20 12:39:56.158673 | 2022-08-20 12:39:56.232282 | 120                        | 0.613408   | 0.056833    | 0%          | 1.630235          |
| 39 | 2022-08-20 12:59:56.549225 | 2022-08-20 12:59:56.633211 | 120                        | 0.699883   | 0.086475    | 0%          | 1.428810          |
| 40 | 2022-08-20 13:19:57.002853 | 2022-08-20 13:19:57.084420 | 120                        | 0.679725   | 0.020158    | 0%          | 1.471183          |
| 41 | 2022-08-20 13:39:57.421839 | 2022-08-20 13:39:57.507863 | 120                        | 0.716867   | 0.037142    | 0%          | 1.394960          |
| 42 | 2022-08-20 13:59:57.813294 | 2022-08-20 13:59:57.895870 | 120                        | 0.688133   | 0.028733    | 0%          | 1.453207          |
| 43 | 2022-08-20 14:19:58.196888 | 2022-08-20 14:19:58.269485 | 120                        | 0.604975   | 0.083158    | 0%          | 1.652961          |
| 44 | 2022-08-20 14:39:58.706071 | 2022-08-20 14:39:58.783474 | 120                        | 0.645025   | 0.040050    | 0%          | 1.550328          |
| 45 | 2022-08-20 14:59:59.082196 | 2022-08-20 14:59:59.162974 | 120                        | 0.673150   | 0.028125    | 0%          | 1.485553          |
| 46 | 2022-08-20 15:19:59.453925 | 2022-08-20 15:19:59.537248 | 120                        | 0.694358   | 0.021208    | 0%          | 1.440179          |
| 47 | 2022-08-20 15:40:59.867645 | 2022-08-20 15:40:59.955916 | 120                        | 0.735592   | 0.041233    | 0%          | 1.359450          |
| 48 | 2022-08-20 16:00:00.255084 | 2022-08-20 16:00:00.343309 | 120                        | 0.735208   | 0.000383    | 0%          | 1.360159          |
| 49 | 2022-08-20 16:20:00.633693 | 2022-08-20 16:20:00.709699 | 120                        | 0.633383   | 0.101825    | 0%          | 1.578823          |
| 50 | 2022-08-20 16:40:00.991925 | 2022-08-20 16:40:01.077933 | 120                        | 0.716733   | 0.083350    | 0%          | 1.395219          |
| 51 | 2022-08-20 17:00:01.550769 | 2022-08-20 17:00:01.627774 | 120                        | 0.641708   | 0.075025    | 0%          | 1.558340          |
| 52 | 2022-08-20 17:20:01.914915 | 2022-08-20 17:20:01.994055 | 120                        | 0.659500   | 0.017792    | 0%          | 1.516300          |
| 53 | 2022-08-20 17:40:02.289794 | 2022-08-20 17:40:02.373306 | 120                        | 0.695933   | 0.036433    | 0%          | 1.436919          |
| 54 | 2022-08-20 18:00:02.661139 | 2022-08-20 18:00:02.746330 | 120                        | 0.709925   | 0.013992    | 0%          | 1.408599          |
| 55 | 2022-08-20 18:20:03.052859 | 2022-08-20 18:20:03.136751 | 120                        | 0.699100   | 0.010825    | 0%          | 1.430411          |
| 56 | 2022-08-20 18:40:03.464177 | 2022-08-20 18:40:03.547237 | 120                        | 0.692167   | 0.006933    | 0%          | 1.444739          |

| No        | From Power Meter           | To Database                | Size Data Kirim<br>(bytes) | Delay (ms) | Jitter (ms) | Packet Loss | Throughput (kbps) |
|-----------|----------------------------|----------------------------|----------------------------|------------|-------------|-------------|-------------------|
| 57        | 2022-08-20 19:00:03.849001 | 2022-08-20 19:00:03.922084 | 120                        | 0.609025   | 0.083142    | 0%          | 1.641969          |
| 58        | 2022-08-20 19:20:04.214319 | 2022-08-20 19:20:04.297032 | 120                        | 0.689275   | 0.080250    | 0%          | 1.450800          |
| 59        | 2022-08-20 19:40:04.719728 | 2022-08-20 19:40:04.805535 | 120                        | 0.715058   | 0.025783    | 0%          | 1.398487          |
| 60        | 2022-08-20 20:00:05.118287 | 2022-08-20 20:00:05.199544 | 120                        | 0.677142   | 0.037917    | 0%          | 1.476796          |
| 61        | 2022-08-20 20:20:05.561685 | 2022-08-20 20:20:05.636499 | 120                        | 0.623450   | 0.053692    | 0%          | 1.603978          |
| 62        | 2022-08-20 20:40:05.979117 | 2022-08-20 20:40:06.066361 | 120                        | 0.727033   | 0.103583    | 0%          | 1.375453          |
| 63        | 2022-08-20 21:00:06.409711 | 2022-08-20 21:00:06.484650 | 120                        | 0.624492   | 0.102542    | 0%          | 1.601302          |
| 64        | 2022-08-20 21:20:06.978179 | 2022-08-20 21:20:07.054260 | 120                        | 0.634008   | 0.009517    | 0%          | 1.577266          |
| 65        | 2022-08-20 21:40:07.543192 | 2022-08-20 21:40:07.616367 | 120                        | 0.609792   | 0.024217    | 0%          | 1.639904          |
| 66        | 2022-08-20 22:00:07.972428 | 2022-08-20 22:00:08.052670 | 120                        | 0.668683   | 0.058892    | 0%          | 1.495476          |
| 67        | 2022-08-20 22:20:08.368955 | 2022-08-20 22:20:08.457122 | 120                        | 0.734725   | 0.066042    | 0%          | 1.361053          |
| 68        | 2022-08-20 22:40:08.752935 | 2022-08-20 22:40:08.837009 | 120                        | 0.700617   | 0.034108    | 0%          | 1.427314          |
| 69        | 2022-08-20 23:00:09.152533 | 2022-08-20 23:00:09.230008 | 120                        | 0.645625   | 0.054992    | 0%          | 1.548887          |
| 70        | 2022-08-20 23:20:09.550957 | 2022-08-20 23:20:09.624069 | 120                        | 0.609267   | 0.036358    | 0%          | 1.641317          |
| 71        | 2022-08-20 23:40:09.922923 | 2022-08-20 23:40:10.000930 | 120                        | 0.650058   | 0.040792    | 0%          | 1.538323          |
| Total     |                            |                            |                            | 47.365725  | 2.881700    | 0%          | 106.847334        |
| Rata-rata |                            |                            |                            | 0.667123   | 0.04587     | 0%          | 1.50892           |