

January 4, 2019

VIA HAND DELIVERY & ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

**RE: Docket 4513 – In Re: Proceeding to Establish a Pilot Metering Proposal for
Municipal-Owned Streetlights
Responses to Division Data Requests – Set 2**

Dear Ms. Massaro:

Enclosed please find 10 copies of National Grid's¹ responses to the Second Set of Data Requests issued by the Division of Public Utilities and Carriers (Division) in the above-referenced docket.

Thank you for your attention to this matter. If you have any questions, please contact me at 401-784-7415.

Very truly yours,



Robert J. Humm

Enclosure

cc: Docket 4513 Service List
Christy Hetherington, Esq.
Al Mancini, Division
John Bell, Division

¹ The Narragansett Electric Company d/b/a National Grid (National Grid or the Company).

Certificate of Service

I hereby certify that a copy of the cover letter and any materials accompanying this certificate was electronically transmitted to the individuals listed below.

The paper copies of this filing are being hand delivered to the Rhode Island Public Utilities Commission and to the Rhode Island Division of Public Utilities and Carriers.



Joanne M. Scanlon

January 4, 2019

Date

Docket No. 4513 - National Grid – Streetlight Metering Pilot Proposal Service List updated 1/4/2019

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Division R-II-1

Request:

Provide a copy of all communications between National Grid and each manufacturer as referenced by Mr. Walter in his Rebuttal Testimony on page 8, lines 10 through 13.

Response:

Mr. Walter's Rebuttal Testimony at page 8, lines 10 through 13 should be revised to reference that the concerns expressed by two networked lighting control (NLC) manufacturers were following completion of the bench testing portion of the Stage 1-Phase 1 laboratory testing and issuance of the corresponding test results, not the release of the Street Light Metering Pilot (Pilot) Final Report. Thus, Mr. Walter's Rebuttal Testimony at page 8, lines 10 through 13 should state as follows (changes marked): "Following completion of the bench testing portion of the Stage 1-Phase 1 laboratory testing and issuance of the corresponding test results~~release of the Final Report~~, two of the NLC manufacturers have expressed concerns regarding the conclusions having been developed from certain negative test results based upon laboratory test criteria outside the scope of ANSI C12.20 standards and in excess of the individual NLC published operational limits." In consideration of this correction, in response to this request the Company is providing information regarding communications between the Company and each manufacturer regarding the manufacturer's concerns following completion of bench testing and issuance of the corresponding test results.

On July 28, 2016, the Company provided each NLC manufacturer with a copy of the executed laboratory bench test plan specifications and their respective individual NLC test results data. Please see Attachment R-II-1-1 for a copy of the July 28, 2016 email communications. The laboratory bench test plan specifications provided on July 28, 2016 were the same specifications provided to the NLC manufacturers for review on March 14, 2016, before bench testing began. It should be noted that no manufacturer feedback was received by the Company following the March, 2016 issuance of the bench test plan. The Company's July 28, 2016 email requested that the manufacturers review the test data results and invited their feedback. Please see Attachment R-II-1-2 for a copy of the two manufacturer's acknowledgments of the July 28, 2016 email. Additionally, the Company proposed conference calls with each of the three NLC manufacturers. Two manufacturers, SELC and CIMCON, accepted and expressed concerns related to the test results. The subsequent communications and respective conference calls associated with each of these two manufacturers concerns are presented below.

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Communications with SELC

Please see Attachment R-II-1-3 for a copy of an email chain between the Company and SELC on August 8, 2016. In particular, on August 8, 2016, the Company received an email communication from SELC expressing concurrence with specific meter accuracy results obtained through the Pilot's testing program, among other information. The Company responded to SELC twice on the same day (August 8, 2016) and proposed a conference call.

On Wednesday, August 10, 2016 at 10:00 a.m., the Company conducted a conference call with the following participants: John Walter and Edward Bonetti from National Grid, John Williams from TESCO, and Amanda Dixon and Liam Terrigan from SELC. Mr. Williams first reviewed the SELC test data and addressed any questions raised by SELC. Ms. Dixon and Mr. Terrigan expressed that the test results were what SELC had expected based upon the NLCs SELC had provided for testing. Ms. Dixon and Mr. Terrigan stated that SELC was working on a solution that would be revenue grade and that they were confident that the upgraded NLCs could achieve +/- 0.5 percent accuracy. They also discussed the optical pulse output to be incorporated in the upgraded NLCs. The conference call concluded with all parties acknowledging that the forthcoming ANSI C136 NLC meter accuracy testing standard was still in development, and that in the meantime ANSI C12.20 was the best alternative for testing protocols at the time.

Mr. Walter from National Grid and Ms. Dixon from SELC had two subsequent conversations – between September 11-13, 2017 and between October 2-4, 2018 – related to the Pilot's conclusions; the Company's optional testing protocols exceeding ANSI C12.20 criteria; and the associated test results of the SELC NLCs. In those conversations, Ms. Dixon expressed displeasure with the stated results of the SELC NLCs being tested beyond the ANSI C12.20 criteria and the subsequent general classification that the NLCs failed to be of revenue grade accuracy. Mr. Walter confirmed that the Pilot's conclusions were developed from the ANSI C12.20 test results and that the Pilot budget and schedule restricted the additional testing of the upgraded SELC nodes at that time.

Communications with CIMCON

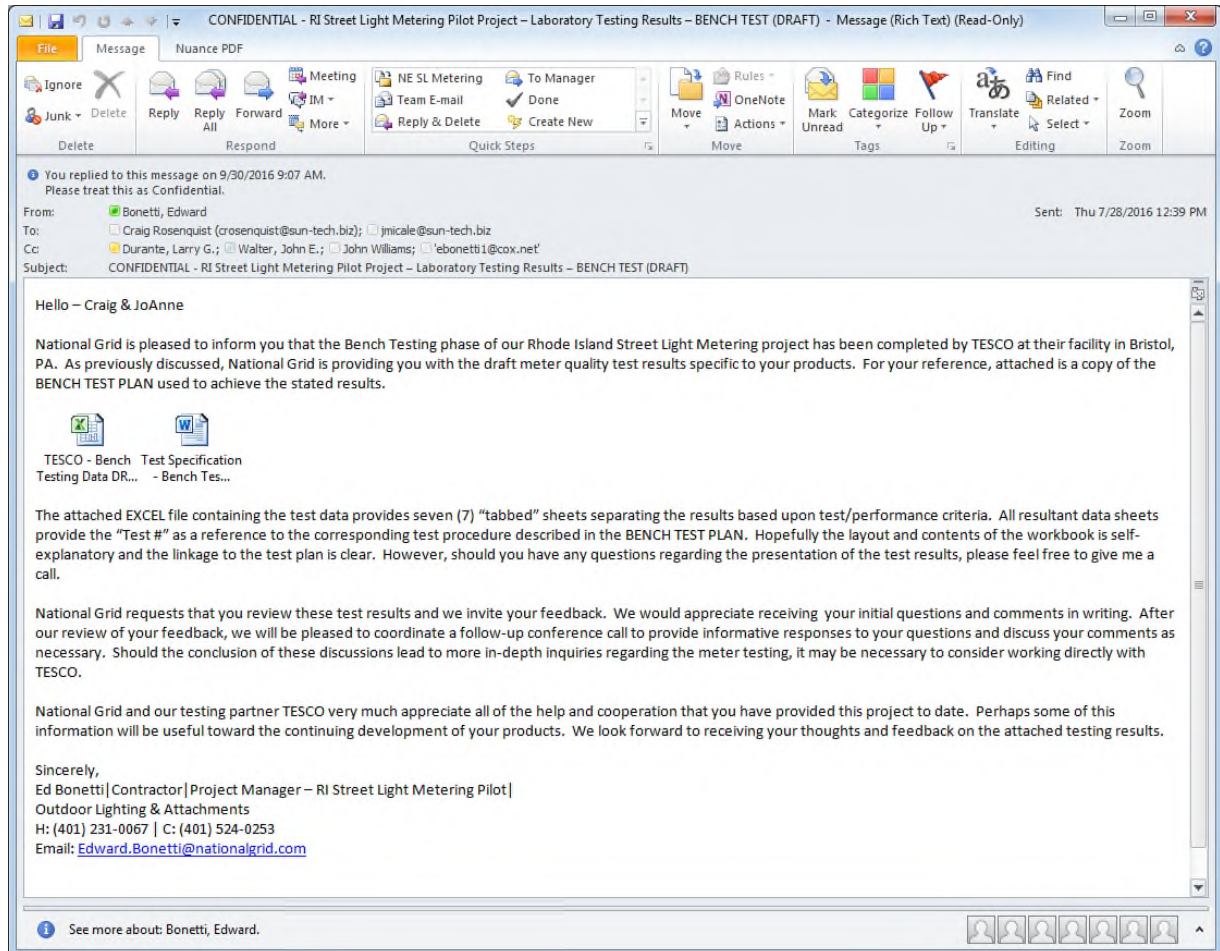
Following CIMCON's acknowledgement of the test results communication on July 28, 2016 (see Attachment R-II-1-2), the Company did not receive any subsequent communications from CIMCON until late November 2016, when CIMCON requested a conference call regarding CIMCON's bench test results. The conference call occurred on December 6, 2016 at 2:30 p.m. and was attended by John Walter and Edward Bonetti from National Grid; John Williams from TESCO; and Tod Riedel, Mark Carter, and Anil Agrawal from CIMCON. During the call, Mr. Williams reviewed the test data for CIMCON and addressed any questions raised by CIMCON. Mr. Carter discussed CIMCON's NLC testing as compared to the Pilot's bench testing and emphasized CIMCON's firmware limitations of 8.5 amps as the high-end load limitation, in

Division R-II-1, page 3

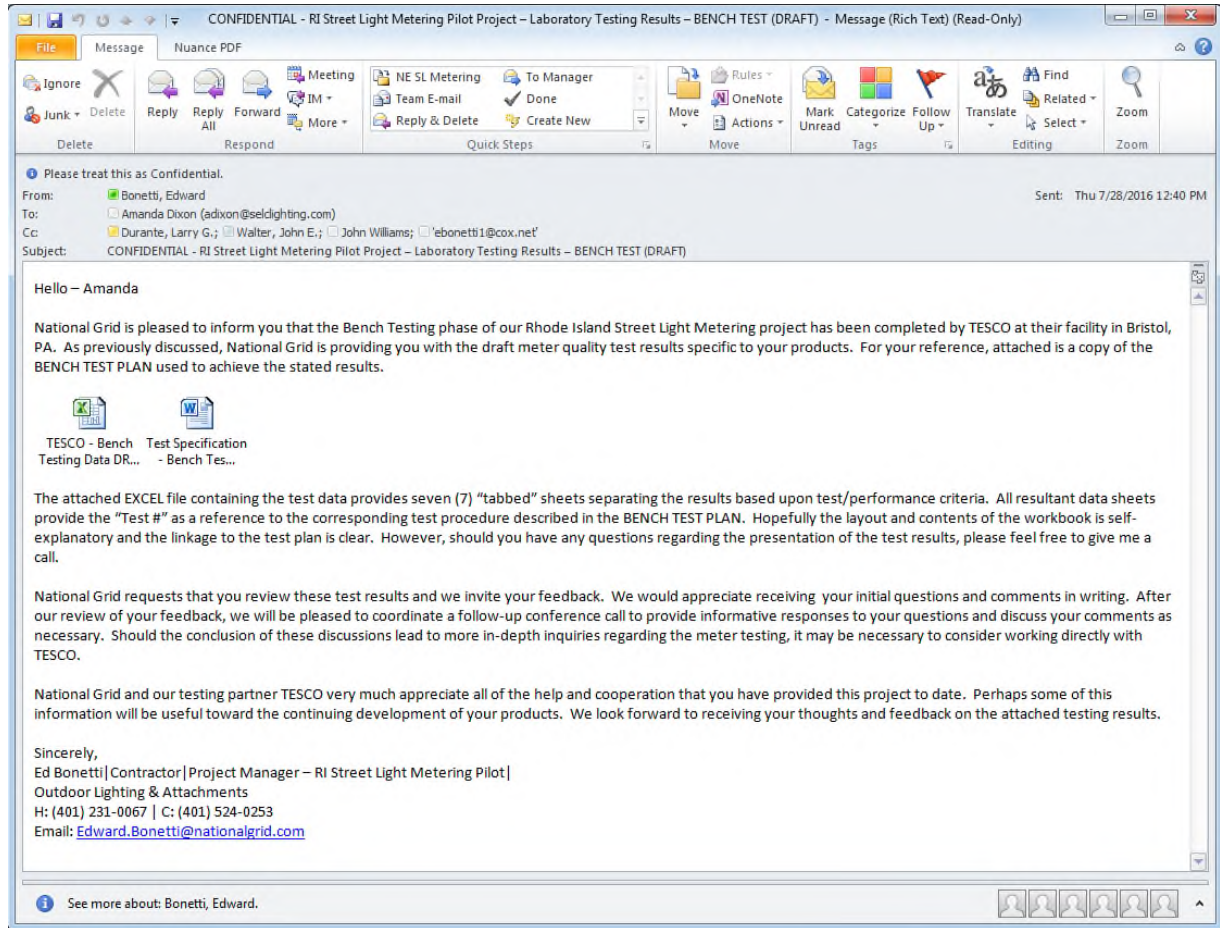
addition to some allowance for “creep” at the low-end load limit and at cut-off. Mr. Carter stated that the CIMCON NLCs should maintain 2.0 percent accuracy across the entire CIMCON defined load range. Both the Company and TESCO expressed that neither were aware of either load condition prior to the December 6, 2016 call, and that if those conditions were known before testing, then the testing and reporting considerations would have been made. Mr. Williams concluded by briefly discussing the parasitic load findings. Following additional discussion on the load limitations of the CIMCON NLCs, Mr. Carter stated that CIMCON would provide a letter summarizing its concerns regarding the Company's bench testing results and the associated NLC electrical limitations. The call concluded following a general discussion regarding field applications utilizing CIMCON technology products, including a brief statement of their involvement in the Pacific Gas & Electric street light metering pilot. On December 7, 2016, CIMCON sent a letter to the Company providing the electrical operating limitations discussed during the December 6, 2016 conference call. Please see Attachment R-II-1-4 for a copy of CIMCON's December 7, 2016 letter.

Attachment R-II-1-1

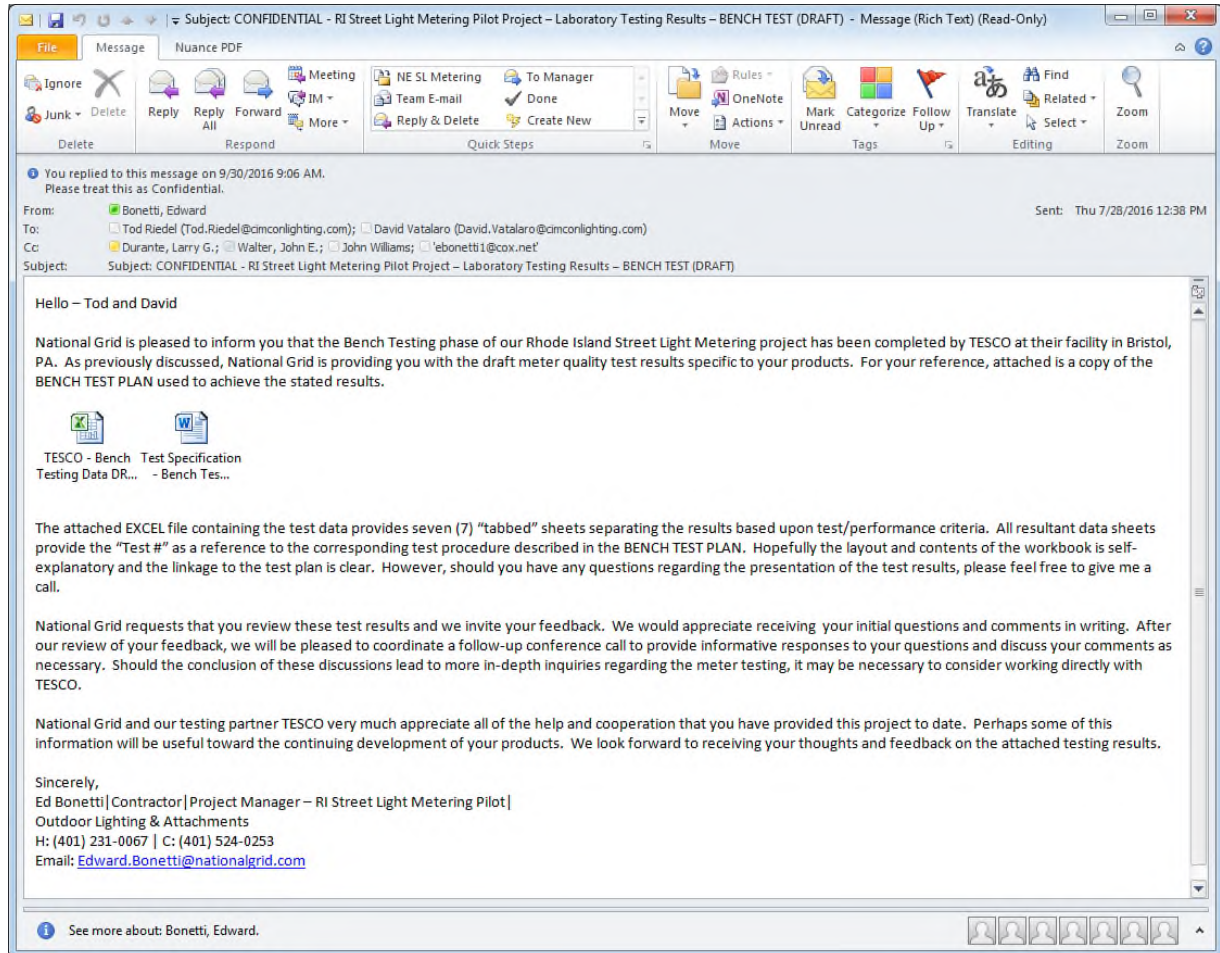
Sunrise Technologies -




SELC -



CIMCON –



ORIGINATING GROUP: TESCO ENGINEERING	ORIGIN DATE: 19-Feb-2016	REVISION DATE: 3-Mar-2016	NO. OF SHEETS: 9
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<p>Test Specification for</p>  <p>Photocell Node Bench Testing Project 8594</p>																				
SHEET NO.	1	2	3	4	5	6	7	8	9	10										
REVISION	-	-	-	3	-	-	1	3	3	3										
APPROVED: Originator: John Williams										DATE: 19-Feb-16										
APPROVED: Electrical:										DATE:										
APPROVED: Project Mgr.: John Williams										DATE: 19-Feb-16										



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1 Purpose

Define all test equipment, procedures, and documentation specifications for the photocell node bench testing to be performed by Tesco for National Grid - RI.

2 Definitions, Acronyms and Abbreviations

Abbreviation	Definition
A	Amperes
AC	Alternating Current
ANSI	American National Standards Institute
DPT	Digital Power Technologies (Power supply mfg.)
MTB	Meter Test Board
PF	Power Factor
THD	Total Harmonic Distortion
V	Volt
VT	Voltage Transformer
Wh	Watt-hour

3 Test Equipment Specifications

3.1 Meter Test Board (MTB)

The Tesco MTB is a four socket unit capable of simultaneously testing 4 meters. It is ANSI C12.20 compliant and uses a NIST traceable 3 phase reference standard.

3.1.1 Main Components

3.1.1.1 Digital Power Supply - DPT 024 Series 3 phase source.

3.1.1.1.1 Frequency Accuracy - +/-0.02Hz

3.1.1.1.2 Voltage Set point accuracy - 0.5%

3.1.1.1.3 THD <0.5% Linear load

3.1.1.1.4 Phase Resolution - 0.01 degree

3.1.1.1.5 Current Accuracy - 0.5%

3.1.1.2 Reference standard - Radian RD-30-201

3.1.1.2.1 .04% accuracy class

3.1.1.2.2 Serial Number 301510

3.1.1.2.3 Calibration date: 04/20/15



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3.1.1.2.4 Calibration certificate detailing results and NIST traceability available upon request.

[\(Internal Tesco Link to Cal Cert\)](#)

3.1.1.3 Programmable Logic Controller – Automation Direct, Productivity 3000 series

3.1.1.3.1 Main unit controller that is responsible for setting up the power supply, monitoring voltages and currents, and counting reference standard energy pulses.

3.1.1.4 Socket adapter – by Tesco

3.1.1.4.1 This unit adapts a 7 pin standard photocell socket to a standard metering socket.

3.1.1.4.2 Design details available upon request.

3.1.1.5 Silver Springs Field Service Unit (FSU) – communication adapter between PC and Cimcon, Sunrise, and SELC nodes.

3.1.1.6 Cimcon Handheld Configurator - communication adapter between PC and Cimcon nodes.

4 Test Specifications

4.1 This section is meant to adhere as closely as possible to ANSI C12.20.

4.2 For the purposes of these tests, the node meter function will be treated as an ANSI socket meter form 1S.

4.3 Test Conditions

4.3.1 Temperature: 23°C, +/- 2°C

4.3.2 Rated voltage (120VAC): +/- 1%

4.3.3 Rated frequency (60Hz): +/- 1Hz

4.3.4 Test Amperes (1.5/10AAC): +/- 1%

4.3.5 Unity Power factor (0°): +/- 2°

4.3.6 Nodes will be temperature stabilized before testing

4.4 Prior to each test set performed, the nodes will be energized for a 5 minute warm-up period.

4.5 Tests to be performed

4.5.1 ANSI C12.20 – Test number 1: No Load



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- 4.5.1.1 The node with only the voltage circuit energized shall not register one equivalent rotation in watthours (for nodes with a metering pulse) or 1 watthour in 10 minutes.
- 4.5.2 ANSI C12.20 – Test number 2: Starting load
 - 4.5.2.1 The node shall operate continuously with a load current of .01A at its lowest rated voltage.
- 4.5.3 ANSI C12.20 – Test number 3: Load performance
 - 4.5.3.1 Each node will be tested at 120V and 10A. The performance of each node will be documented under this condition. Comparison will be made in each case to the stated accuracy specification (0.5% or 2.0%).
 - 4.5.3.2 Each node will be tested at 120V and 1.0A. The performance of each node will be documented under this condition. Comparison will be made in each case to the stated accuracy specification (0.5% or 2.0%).
- 4.5.4 ANSI C12.20 – Test number 4: Effect of variation of power factor for single element meters.
 - 4.5.4.1 Each node will be tested at 120V and 10A, with 0.5 lagging power factor. The performance of each node will be documented under this condition. Comparison will be made in each case to the stated accuracy specification (0.5% or 2.0%).
- 4.6 Optional tests that can be performed (time permitting)
 - 4.6.1 ANSI C12.20 – Test number 5: Effect of variation of voltage
 - 4.6.1.1 Each node will be tested at 120V and 10A. The performance of each node will be documented under this condition. This will be given as the reference accuracy.
 - 4.6.1.2 Each node will be tested at 108V and 10A. The performance of each node will be documented under this condition. Comparison will be made in each case to the reference accuracy listed in 4.6.1.1.
 - 4.6.1.3 Each node will be tested at 132V and 10A. The performance of each node will be documented under this condition. Comparison will be made in



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- each case to the reference accuracy listed in 4.6.1.1.
- 4.6.1.4 Each node will be tested at 120V and 1.0A. The performance of each node will be documented under this condition. This will be given as the reference accuracy.
 - 4.6.1.5 Each node will be tested at 108V and 1.0A. The performance of each node will be documented under this condition. Comparison will be made in each case to the reference accuracy listed in 4.6.1.4.
 - 4.6.1.6 Each node will be tested at 132V and 1.0A. The performance of each node will be documented under this condition. Comparison will be made in each case to the reference accuracy listed in 4.6.1.4.
- 4.6.2 ANSI C12.20 – Test number 5: Effect of variation of frequency (note that all previous testing is done at 60Hz)
- 4.6.2.1 Each node will be tested at 120V, 10A and 60Hz. The performance of each node will be documented under this condition. This will be given as the reference accuracy.
 - 4.6.2.2 Each node will be tested at 120V, 10A and 58.8Hz. The performance of each node will be documented under this condition. Comparison will be made in each case to the reference accuracy listed in 4.6.2.1.
 - 4.6.2.3 Each node will be tested at 120V, 10A and 61.2Hz. The performance of each node will be documented under this condition. Comparison will be made in each case to the reference accuracy listed in 4.6.2.1.
 - 4.6.2.4 Each node will be tested at 120V, 1.0A and 60Hz. The performance of each node will be documented under this condition. This will be given as the reference accuracy.
 - 4.6.2.5 Each node will be tested at 120V, 1.0A and 58.8Hz. The performance of each node will be documented under this condition. Comparison will be made in each case to the reference accuracy listed in 4.6.2.4.



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- 4.6.2.6 Each node will be tested at 120V, 1.0A and 61.2Hz. The performance of each node will be documented under this condition. Comparison will be made in each case to the reference accuracy listed in 4.6.2.4.
- 4.6.3 In addition to the ANSI specified tests, perform multiple accuracy tests per node type at +/-15% and +/-20% voltage variations.
- 4.6.4 In addition to the ANSI specified tests, perform multiple accuracy tests per node type at 0.5A and 15A.
- 4.7 Testing method
 - 4.7.1 Silver Spring Communication method
 - 4.7.1.1 This method will be used on all nodes for all tests listed in sections 4.5 and 4.6.
 - 4.7.1.2 Each test will be performed on the Tesco MTB, four nodes at a time.
 - 4.7.1.3 Each node will be energized with potential only.
 - 4.7.1.4 Each node will be registered through the Silver Springs network using Silver Springs' Communication Tester software (version 6.10.25413).
 - 4.7.1.5 An initial Wh query will be done on each node and recorded in the data collection spreadsheet.
 - 4.7.1.6 The testing parameters will then be set in the MTB. The MTB will be set to run a Demand test, with the interval set to a value which should register at least 1,000Wh on both the nodes and the reference standard (i.e. for 120V, 1.00 PF, 10A test, the time interval will be set to $(1,000 \times 60) / (120 \times 10) = 50$ minutes).
 - 4.7.1.7 At the end of the interval, the number of Wh from the reference standard will be recorded, along with the ending Wh readings from each of the four nodes.
 - 4.7.1.8 The percent accuracy will then be given by the ratio of Node Wh/Reference Standard Wh.
 - 4.7.2 Meter Pulse method



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- 4.7.2.1 This method will only be used on nodes that have a metering IR pulse output on all the tests listed in sections 4.5 and 4.6, and will be done in addition to the method described in section 4.7.1
- 4.7.2.2 Each test will be performed on the Tesco MTB, four nodes at a time.
- 4.7.2.3 Each node will be energized with potential and load current so that the metering pulse will be activated.
- 4.7.2.4 Each node's metering pulse pickup assembly (part of the MTB) will be aligned with the metering pulse output.
- 4.7.2.5 The testing parameters will then be set in the MTB. The MTB will be set to run a Full Load, Light Load, or Power Factor test, depending on the requirements of the test.
- 4.7.2.6 At the end of the test, the registration value will be read directly from the MTB.
- 4.7.3 Cimcon Communication method
 - 4.7.3.1 This method will be used on all Cimcon nodes fitted with the Cimon communication hardware for all tests listed in sections 4.5 and 4.6.
 - 4.7.3.2 Each test will be performed on the Tesco MTB, four nodes at a time.
 - 4.7.3.3 Each node will be energized with potential only.
 - 4.7.3.4 Each node will be registered through the Cimcon network using Cimcon's Communication software (version ????).
 - 4.7.3.5 An initial Wh query will be done on each node and recorded in the data collection spreadsheet.
 - 4.7.3.6 The testing parameters will then be set in the MTB. The MTB will be set to run a Demand test, with the interval set to a value which should register at least 1,000Wh on both the nodes and the reference standard (i.e. for 120V, 1.00 PF, 10A test, the time interval will be set to $(1,000 \times 60) / (120 \times 10) = 50$ minutes).
 - 4.7.3.7 At the end of the interval, the number of Wh from the reference standard will be recorded, along with



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the ending Wh readings from each of the four nodes.

- 4.7.3.8 The percent accuracy will then be given by the ratio of Node Wh/Reference Standard Wh.

5 Documentation

- 5.1 The results of each of the aforementioned tests will be documented in a fashion that will first sort the information based on the test performed.
- 5.2 Each test result will be further sorted by node manufacturer.
- 5.3 Each test result will be listed and if multiple tests were performed based on the same criteria, due to a test procedural fault, or due to a repair required to the testing equipment; those tests will be listed together, with a notation as to the reasons why the additional test was required.
- 5.4 Each test result will (at a minimum) list the following information:
 - 5.4.1 Test name and description (as listed in sections 4.5 and 4.6 above)
 - 5.4.2 Test conditions (as listed in section 4 above)
 - 5.4.3 Manufacturer name
 - 5.4.4 Node serial number or other identifying information.
 - 5.4.5 Expected test result or acceptable result.
 - 5.4.6 Actual result
 - 5.4.7 Units
 - 5.4.8 Notes – this will be a section that will be used in the case where the tester observes a notable condition that existed prior to, during, or after the test was performed.
- 5.5 Each section will be followed by an additional notes section that will be used to summarize the findings and will be kept to observable facts.
- 5.6 Finally, the report will contain a summary of all testing performed, observed information not included in the otherwise presented data, and a clearly indicated section for opinions and recommendations.

6 Reference Documents

- 6.1 ANSI C12.20 Specification – see [Link to ANSI webstore](#)



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7 Revision Record

Revision Record

REV	ECN:	REVISION DESCRIPTION:	APPR:	REL:
-	N/A	Draft	JFW	2/17/16
1	N/A	Added section 6 – reference documents Added section 4.6.3 – additional voltage variations	JFW	3/3/16
2	N/A	Revised section 3.1; added (MTB) reference Revised section 3.1.1.2.4; changed displayed text for internal hyperlink Revised section 3.1.1.5; was FTU Revised section 4.3.4; was 15AAC	JFW	3/4/16
3	N/A	Added section 4.6.4 Added section 3.1.1.6 Added section 4.7.3	JFW	3/10/16

Date	Time	Test#	Description	Volts	Frequency	Amps	Power Factor	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	Observations	Notes
03/18/16	12:45:00	4.5.1	No Load	120	60	0	1.00	0013500500102B4C	14	Sunrise	SSN	0	0	0	0.000	100.00	0.00	.5% +/- 1Wh		
03/18/16	12:45:00	4.5.1	No Load	120	60	0	1.00	0013500500102DDC	12	Sunrise	SSN	19	19	0	0.000	100.00	0.00	.5% +/- 1Wh		
03/18/16	12:45:00	4.5.1	No Load	120	60	0	1.00	0013500500102A9C	11	Sunrise	SSN	0	0	0	0.000	100.00	0.00	.5% +/- 1Wh		
03/18/16	12:45:00	4.5.1	No Load	120	60	0	1.00	0013500500102B03	13	Sunrise	SSN	0	0	0	0.000	100.00	0.00	.5% +/- 1Wh		
03/18/16	12:55:00	4.5.2	Starting Load	105	60	0.01	1.00	0013500500102B4C	14	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh	current set to 10mA; node read 36mA; Watts registered 1W. Spec says min volts =105	
03/18/16	12:55:00	4.5.2	Starting Load	105	60	0.01	1.00	0013500500102DDC	12	Sunrise	SSN	19	19	0		100.00	0.00	.5% +/- 1Wh	current set to 10mA; node read 36mA; Watts registered 1W. Spec says min volts =105	
03/18/16	12:55:00	4.5.2	Starting Load	105	60	0.01	1.00	0013500500102A9C	11	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh	current set to 10mA; node read 36mA; Watts registered 1W. Spec says min volts =105	
03/18/16	12:55:00	4.5.2	Starting Load	105	60	0.01	1.00	0013500500102B03	13	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh	current set to 10mA; node read 36mA; Watts registered 1W. Spec says min volts =105	
03/18/16	13:15:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102B4C	14	Sunrise	SSN	0	1000	1000	1001.706	99.83	-0.17	.5% +/- 1Wh		
03/18/16	13:15:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102DDC	12	Sunrise	SSN	19	1019	1000	1001.706	99.83	-0.17	.5% +/- 1Wh		
03/18/16	13:15:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102A9C	11	Sunrise	SSN	0	999	999	1001.706	99.73	-0.27	.5% +/- 1Wh		
03/18/16	13:15:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102B03	13	Sunrise	SSN	0	1001	1001	1001.706	99.93	-0.07	.5% +/- 1Wh		
03/18/16	14:10:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102B4C	14	Sunrise	SSN	929	1952	1023	1024.116	99.89	-0.11	.5% +/- 1Wh	how did the wh readings go down here?	
03/18/16	14:10:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102DDC	12	Sunrise	SSN	947	1969	1022	1024.116	99.79	-0.21	.5% +/- 1Wh	how did the wh readings go down here?	
03/18/16	14:10:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102A9C	11	Sunrise	SSN	928	1950	1022	1024.116	99.79	-0.21	.5% +/- 1Wh	how did the wh readings go down here?	
03/18/16	14:10:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102B03	13	Sunrise	SSN	929	1952	1023	1024.116	99.89	-0.11	.5% +/- 1Wh	how did the wh readings go down here?	
03/21/16	10:40:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102A9C	11	Sunrise	SSN	1970	2970	1000	1002.249	99.78	-0.22	.5% +/- 1Wh		
03/21/16	10:40:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102DDC	12	Sunrise	SSN	1990	2989	999	1002.249	99.68	-0.32	.5% +/- 1Wh		
03/21/16	10:40:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102B03	13	Sunrise	SSN	1973	2973	1000	1002.249	99.78	-0.22	.5% +/- 1Wh		
03/21/16	10:40:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102B4C	14	Sunrise	SSN	1973	2973	1000	1002.249	99.78	-0.22	.5% +/- 1Wh		
03/30/16	10:15:00	4.5.1	No Load	120	60	0	1.00	0013500500102DED	13	Sunrise	SSN	26	26	0		100.00	0.00	.5% +/- 1Wh		
03/30/16	10:15:00	4.5.1	No Load	120	60	0	1.00	0013500500102D74	12	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh		
03/30/16	10:15:00	4.5.1	No Load	120	60	0	1.00	0013500500102DB7	11	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh		
03/30/16	10:15:00	4.5.1	No Load	120	60	0	1.00	0013500500103141	14	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh		
03/30/16	10:25:00	4.5.2	Starting Load	105	60	0.01	1.00	0013500500102DED	13	Sunrise	SSN	26	26	0		100.00	0.00	.5% +/- 1Wh	A set to 10mA, node read 36mA. W read 1W	
03/30/16	10:25:00	4.5.2	Starting Load	105	60	0.01	1.00	0013500500102D74	12	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh	A set to 10mA, node read 36mA. W read 1W	
03/30/16	10:25:00	4.5.2	Starting Load	105	60	0.01	1.00	0013500500102DB7	11	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh	A set to 10mA, node read 37mA. W read 1W	
03/30/16	10:25:00	4.5.2	Starting Load	105	60	0.01	1.00	0013500500103141	14	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh	A set to 10mA, node read 38mA. W read 1W	
03/30/16	10:35:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102DED	13	Sunrise	SSN	26	1022	996	1000.883	99.51	-0.49	.5% +/- 1Wh		
03/30/16	10:35:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102D74	12	Sunrise	SSN	0	996	996	1000.883	99.51	-0.49	.5% +/- 1Wh		
03/30/16	10:35:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102DB7	11	Sunrise	SSN	0	998	998	1000.883	99.71	-0.29	.5% +/- 1Wh		
03/30/16	10:35:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500103141	14	Sunrise	SSN	0	999	999	1000.883	99.81	-0.19	.5% +/- 1Wh		
03/30/16	12:05:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102DED	13	Sunrise	SSN	1022	2047	1025	1028.740	99.64	-0.36	.5% +/- 1Wh		
03/30/16	12:05:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102D74	12	Sunrise	SSN	996	2021	1025	1028.740	99.64	-0.36	.5% +/- 1Wh		
03/30/16	12:05:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102DB7	11	Sunrise	SSN	998	2025	1027	1028.740	99.83	-0.17	.5% +/- 1Wh		
03/30/16	12:05:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500103141	14	Sunrise	SSN	999	2029	1030	1028.740	100.12	0.12	.5% +/- 1Wh		
03/30/16	13:50:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102DED	13	Sunrise	SSN	2047	3046	999	1002.310	99.67	-0.33	.5% +/- 1Wh		
03/30/16	13:50:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102D74	12	Sunrise	SSN	2021	3019	998	1002.310	99.57	-0.43	.5% +/- 1Wh		
03/30/16	13:50:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102DB7	11	Sunrise	SSN	2025	3025	1000	1002.310	99.77	-0.23	.5% +/- 1Wh		
03/30/16	13:50:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500103141	14	Sunrise	SSN	2029	3031	1002	1002.310	99.97	-0.03	.5% +/- 1Wh		
03/31/16	9:25:00	4.5.1	No Load	120	60	0	1.00	0013500500102A37	11	Sunrise	SSN	1978	1978	0		100.00	0.00	.5% +/- 1Wh		
03/31/16	9:25:00	4.5.1	No Load	120	60	0	1.00	0013500500102B1F	12	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh		
03/31/16	9:35:00	4.5.2	Starting Load	105	60	0.01	1.00	0013500500102A37	11	Sunrise	SSN	1978	1978	0		100.00	0.00	.5% +/- 1Wh	A set to 10mA, node read 37mA. W read 1W	
03/31/16	9:35:00	4.5.2	Starting Load	105	60	0.01	1.00	0013500500102B1F	12	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh	A set to 10mA, node read 38mA. W read 1W	
03/31/16	9:45:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102A37	11	Sunrise	SSN	1978	2973	995	1002.342	99.27	-0.73	.5% +/- 1Wh		
03/31/16	9:45:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102B1F	12	Sunrise	SSN	0	999	999	1002.342	99.67	-0.33	.5% +/- 1Wh		
03/31/16	11:00:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102A37	11	Sunrise	SSN	2973	3992	1019	1025.489	99.37	-0.63	.5% +/- 1Wh		
03/31/16	11:00:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102B1F	12	Sunrise	SSN	999	2022	1023	1025.489	99.76	-0.24	.5% +/- 1Wh		
03/31/16	12:30:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102A37	11	Sunrise	SSN	3992	4992	1000	1003.353	99.67	-0.33	.5% +/- 1Wh		
03/31/16	12:30:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102B1F	12	Sunrise	SSN	2022	3021	999	1003.353	99.57	-0.43	.5% +/- 1Wh		
04/04/16	9:35:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102DB7	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.118	100.02	0.02	2.0% +/- 1Wh		
04/04/16	9:35:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102B1F	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.120	100.00	0.00	2.0% +/- 1Wh		
04/04/16	9:35:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102DED	13	Sunrise	IR Pulse	N/A	N/A	11.12	11.122	99.98	-0.02	2.0% +/- 1Wh		
04/04/16	9:35:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500103141	14	Sunrise	IR Pulse	N/A	N/A	11.12	11.100	100.18	0.18	2.0% +/- 1Wh		
04/04/16	9:40:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102DB7	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.111	100.08	0.08	2.0% +/- 1Wh		
04/04/16	9:40:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102B1F	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.116	100.04	0.04	2.0% +/- 1Wh		
04/04/16	9:40:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102DED	13	Sunrise	IR Pulse	N/A	N/A	11.12	11.110	100.09	0.09	2.0% +/- 1Wh		
04/04/16	9:40:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500103141	14	Sunrise	IR Pulse	N/A	N/A	11.12	11.090	100.27	0.27	2.0% +/- 1Wh		
04/04/16	9:45:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102DB7	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.119	100.01	0.01	2.0% +/- 1Wh		
04/04/16	9:45:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102B1F	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.123	99.97	-0.03	2.0% +/- 1Wh		
04/04/16	9:45:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102DED	13	Sunrise	IR Pulse	N/A	N/A	11.12	11.120	100.00	0.00	2.0% +/- 1Wh		
04/04/16	9:45:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500103141	14	Sunrise	IR Pulse	N/A	N/A	11.12	11.099					

Date	Time	Test#	Description	Volts	Frequency	Amps	Power Factor	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	Observations	Notes
04/04/16	10:35:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102D74	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.138	99.84	-0.16	2.0% +/- 1Wh		
04/04/16	10:35:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102B03	13	Sunrise	IR Pulse	N/A	N/A	11.12	11.118	100.02	0.02	2.0% +/- 1Wh		
04/04/16	10:35:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102B4C	14	Sunrise	IR Pulse	N/A	N/A	11.12	11.108	100.11	0.11	2.0% +/- 1Wh		
04/04/16	10:40:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102A37	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.144	99.78	-0.22	2.0% +/- 1Wh	Pulse very difficult to setup on this one.	
04/04/16	10:40:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102D74	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.126	99.95	-0.05	2.0% +/- 1Wh		
04/04/16	10:40:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102B03	13	Sunrise	IR Pulse	N/A	N/A	11.12	11.105	100.14	0.14	2.0% +/- 1Wh		
04/04/16	10:40:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102B4C	14	Sunrise	IR Pulse	N/A	N/A	11.12	11.100	100.18	0.18	2.0% +/- 1Wh		
04/04/16	10:45:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102A37	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.143	99.79	-0.21	2.0% +/- 1Wh	Pulse very difficult to setup on this one.	
04/04/16	10:45:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102D74	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.137	99.85	-0.15	2.0% +/- 1Wh		
04/04/16	10:45:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102B03	13	Sunrise	IR Pulse	N/A	N/A	11.12	11.112	100.07	0.07	2.0% +/- 1Wh		
04/04/16	10:45:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102B4C	14	Sunrise	IR Pulse	N/A	N/A	11.12	11.114	100.05	0.05	2.0% +/- 1Wh		
04/04/16	10:55:00	4.5.3	Load Performance (FL)	120	60	10	1.00	00135005001D2DDC	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.114	100.05	0.05	2.0% +/- 1Wh		
04/04/16	10:55:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500102A9C	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.117	100.03	0.03	2.0% +/- 1Wh		
04/04/16	12:50:00	4.5.3	Load Performance (PF)	120	60	10	0.50	00135005001D2DDC	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.106	100.13	0.13	2.0% +/- 1Wh		
04/04/16	12:50:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500102A9C	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.106	100.13	0.13	2.0% +/- 1Wh		
04/04/16	12:55:00	4.5.3	Load Performance (LL)	120	60	1	1.00	00135005001D2DDC	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.121	99.99	-0.01	2.0% +/- 1Wh		
04/04/16	12:55:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500102A9C	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.114	100.05	0.05	2.0% +/- 1Wh		

Date	Time	Test#	Description	Volts	Frequency	Amps	Power Factor	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	Observations	Notes
04/19/16	15:50:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	0013500500102D74	11	Sunrise	SSN	5133	6028	895	900.978	99.34	-0.66	.5% +/- 1Wh		
04/19/16	15:50:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	0013500500102DED	12	Sunrise	SSN	4977	5874	897	900.978	99.56	-0.44	.5% +/- 1Wh		
04/19/16	15:50:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	0013500500102A37	13	Sunrise	SSN	7102	7996	894	900.978	99.23	-0.77	.5% +/- 1Wh		
04/19/16	15:50:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	0013500500103141	14	Sunrise	SSN	4967	5868	901	900.978	100.00	0.00	.5% +/- 1Wh		
04/20/16	13:50:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	0013500500102D74	11	Sunrise	SSN	6028	7126	1098	1104.093	99.45	-0.55	.5% +/- 1Wh		
04/20/16	13:50:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	0013500500102DED	12	Sunrise	SSN	5874	6972	1098	1104.093	99.45	-0.55	.5% +/- 1Wh		
04/20/16	13:50:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	0013500500102A37	13	Sunrise	SSN	7996	9092	1096	1104.093	99.27	-0.73	.5% +/- 1Wh		
04/20/16	13:50:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	0013500500103141	14	Sunrise	SSN	5868	6971	1103	1104.093	99.90	-0.10	.5% +/- 1Wh		
04/15/16	18:00:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	0013500500102D74	11	Sunrise	SSN	3239	4137	898	901.668	99.59	-0.41	.5% +/- 1Wh		
04/15/16	18:00:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	0013500500102DED	12	Sunrise	SSN	3083	3981	898	901.668	99.59	-0.41	.5% +/- 1Wh		
04/15/16	18:00:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	0013500500102A37	13	Sunrise	SSN	5212	6107	895	901.668	99.26	-0.74	.5% +/- 1Wh		
04/15/16	18:00:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	0013500500103141	14	Sunrise	SSN	3068	3967	899	901.668	99.70	-0.30	.5% +/- 1Wh		
04/20/16	16:45:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	0013500500102D74	11	Sunrise	SSN	9119	10218	1099	1103.360	99.60	-0.40	.5% +/- 1Wh		
04/20/16	16:45:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	0013500500102DED	12	Sunrise	SSN	8966	10064	1098	1103.360	99.51	-0.49	.5% +/- 1Wh		
04/20/16	16:45:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	0013500500102A37	13	Sunrise	SSN	11083	12179	1096	1103.360	99.33	-0.67	.5% +/- 1Wh		
04/20/16	16:45:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	0013500500103141	14	Sunrise	SSN	8974	10076	1102	1103.360	99.88	-0.12	.5% +/- 1Wh		
04/02/16	15:50:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	0013500500102D74	11	Sunrise	SSN	8121	9119	998	1002.238	99.37	-0.63	.5% +/- 1Wh		
04/02/16	15:50:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	0013500500102DED	12	Sunrise	SSN	7968	8966	998	1002.238	99.47	-0.53	.5% +/- 1Wh		
04/02/16	15:50:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	0013500500102A37	13	Sunrise	SSN	10087	11083	996	1002.238	99.37	-0.63	.5% +/- 1Wh		
04/02/16	15:50:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	0013500500103141	14	Sunrise	SSN	7972	8974	1002	1002.238	99.97	-0.03	.5% +/- 1Wh		
04/20/16	14:50:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	0013500500102D74	11	Sunrise	SSN	7126	8121	995	1001.269	99.59	-0.41	.5% +/- 1Wh		
04/20/16	14:50:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	0013500500102DED	12	Sunrise	SSN	6972	7968	996	1001.269	99.69	-0.31	.5% +/- 1Wh		
04/20/16	14:50:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	0013500500102A37	13	Sunrise	SSN	9092	10087	995	1001.269	99.59	-0.41	.5% +/- 1Wh		
04/20/16	14:50:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	0013500500103141	14	Sunrise	SSN	6971	7972	1001	1001.269	99.79	-0.21	.5% +/- 1Wh		
04/21/16	10:00:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	0013500500102D74	11	Sunrise	SSN	10218	11217	999	1003.110	99.59	-0.41	.5% +/- 1Wh		
04/21/16	10:00:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	0013500500102DED	12	Sunrise	SSN	10064	11064	1000	1003.110	99.69	-0.31	.5% +/- 1Wh		
04/21/16	10:00:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	0013500500102A37	13	Sunrise	SSN	12179	13178	999	1003.110	99.59	-0.41	.5% +/- 1Wh		
04/21/16	10:00:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	0013500500103141	14	Sunrise	SSN	10076	11077	1001	1003.110	99.79	-0.21	.5% +/- 1Wh		
04/22/16	10:00:00	4.6.2.6	Effect of variation of frequency (LL)	120	61.2	1	1.00	0013500500102D74	11	Sunrise	SSN	11217	12214	997	1002.969	99.40	-0.60	.5% +/- 1Wh		
04/22/16	10:00:00	4.6.2.6	Effect of variation of frequency (LL)	120	61.2	1	1.00	0013500500102DED	12	Sunrise	SSN	11064	12063	999	1002.969	99.60	-0.40	.5% +/- 1Wh		
04/22/16	10:00:00	4.6.2.6	Effect of variation of frequency (LL)	120	61.2	1	1.00	0013500500102A37	13	Sunrise	SSN	13178	14176	998	1002.969	99.50	-0.50	.5% +/- 1Wh		
04/22/16	10:00:00	4.6.2.6	Effect of variation of frequency (LL)	120	61.2	1	1.00	0013500500103141	14	Sunrise	SSN	11077	12078	1001	1002.969	99.80	-0.20	.5% +/- 1Wh		

Date	Time	Test#	Description	Volts	Frequency	Amps	Power Factor	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	Observations	Notes
05/19/16	16:45:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	0013500500102D74	11	Sunrise	SSN	12214	13335	1121	1127.210	99.45	-0.55	.5% +/- 1Wh		
05/19/16	16:45:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	0013500500102DB7	12	Sunrise	SSN	3062	4186	1124	1127.210	99.72	-0.28	.5% +/- 1Wh		
05/19/16	16:45:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	0013500500102B4C	13	Sunrise	SSN	3180	4304	1124	1127.210	99.72	-0.28	.5% +/- 1Wh		
05/19/16	16:45:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	0013500500102DED	14	Sunrise	SSN	12063	13185	1122	1127.210	99.54	-0.46	.5% +/- 1Wh		
05/20/16	1:30:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	0013500500102D74	11	Sunrise	SSN	13335	14531	1196	1203.706	99.36	-0.64	.5% +/- 1Wh		
05/20/16	1:30:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	0013500500102DB7	12	Sunrise	SSN	4186	5386	1200	1203.706	99.69	-0.31	.5% +/- 1Wh		
05/20/16	1:30:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	0013500500102B4C	13	Sunrise	SSN	4304	5503	1199	1203.706	99.61	-0.39	.5% +/- 1Wh		
05/20/16	1:30:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	0013500500102DED	14	Sunrise	SSN	13185	14383	1198	1203.706	99.53	-0.47	.5% +/- 1Wh		
05/20/16	2:40:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	0013500500102D74	11	Sunrise	SSN	14531	15377	846	850.808	99.43	-0.57	.5% +/- 1Wh		
05/20/16	2:40:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	0013500500102DB7	12	Sunrise	SSN	5386	6234	848	850.808	99.67	-0.33	.5% +/- 1Wh		
05/20/16	2:40:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	0013500500102B4C	13	Sunrise	SSN	5503	6353	850	850.808	99.91	-0.09	.5% +/- 1Wh		
05/20/16	2:40:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	0013500500102DED	14	Sunrise	SSN	14383	15230	847	850.808	99.55	-0.45	.5% +/- 1Wh		
05/20/16	9:00:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	0013500500102DB7	12	Sunrise	SSN	6234	7032	798	800.272	99.72	-0.28	.5% +/- 1Wh		
05/20/16	9:00:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	0013500500102B4C	13	Sunrise	SSN	6353	7151	798	800.272	99.72	-0.28	.5% +/- 1Wh		
05/20/16	9:00:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	0013500500102D74	11	Sunrise	SSN	15377	16174	797	800.272	99.59	-0.41	.5% +/- 1Wh		
05/20/16	9:00:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	0013500500102DED	14	Sunrise	SSN	15230	16026	796	800.272	99.47	-0.53	.5% +/- 1Wh		
06/02/16	12:00:00	4.6.4	Additional Test (15A)	120	60	15	1.00	0013500500102D74	11	Sunrise	SSN	16174	17145	971	979.504	99.13	-0.87	.5% +/- 1Wh		
06/02/16	12:00:00	4.6.4	Additional Test (15A)	120	60	15	1.00	0013500500102B4C	13	Sunrise	SSN	7151	8127	976	979.504	99.64	-0.36	.5% +/- 1Wh		
06/02/16	12:00:00	4.6.4	Additional Test (15A)	120	60	15	1.00	0013500500102DED	14	Sunrise	SSN	16026	17000	974	979.504	99.44	-0.56	.5% +/- 1Wh		
06/02/16	12:00:00	4.6.4	Additional Test (15A)	120	60	15	1.00	0013500500102DB7	12	Sunrise	SSN	7032	8008	976	979.504	99.64	-0.36	.5% +/- 1Wh		
06/02/16	18:30:00	4.6.4	Additional Test (0.5A)	120	60	0.5	1.00	0013500500102D74	11	Sunrise	SSN	17145	18138	993	1003.727	98.93	-1.07	.5% +/- 1Wh		
06/02/16	18:30:00	4.6.4	Additional Test (0.5A)	120	60	0.5	1.00	0013500500102B4C	13	Sunrise	SSN	8127	9128	1001	1003.727	99.73	-0.27	.5% +/- 1Wh		
06/02/16	18:30:00	4.6.4	Additional Test (0.5A)	120	60	0.5	1.00	0013500500102DED	14	Sunrise	SSN	17000	17999	999	1003.727	99.53	-0.47	.5% +/- 1Wh		
06/02/16	18:30:00	4.6.4	Additional Test (0.5A)	120	60	0.5	1.00	0013500500102DB7	12	Sunrise	SSN	8008	9006	998	1003.727	99.43	-0.57	.5% +/- 1Wh		

Date	Time	Test#	Description	Volts	Frequency	Metered Load (Amps)	Parasitic Load (mA)	Parasitic Load (VA)	Node ID	Socket #	Manufacturer	Method	Observations	Notes
06/13/16	11:10:00	N/A	Parasitic Load	120.257	60	0	6.94	0.835	00135005001D2DDC	11	Sunrise	SSN		
06/13/16	11:12:00	N/A	Parasitic Load	120.257	60	0	6.94	0.835	0013500500102B1F	11	Sunrise	SSN		
06/13/16	11:14:00	N/A	Parasitic Load	120.257	60	0	6.95	0.836	0013500500102B4C	11	Sunrise	SSN		
06/13/16	11:16:00	N/A	Parasitic Load	120.257	60	0	6.96	0.837	0013500500102DED	11	Sunrise	SSN		
06/13/16	11:18:00	N/A	Parasitic Load	120.257	60	0	6.94	0.835	0013500500102DB7	11	Sunrise	SSN		

Date	Testing Note
21-Mar	Takes a few minutes for any of these nodes to come online after even a brief (<10sec) power outage
31-Mar	The Sunrise nodes seem to continue to communicate for a period of time after they have been powered down.
4-Apr	Would be good for the Sunrise nodes to have some feature on the housing to better align the ir pulse sensor.
6-Apr	Handheld configurator had been set to wrong channel (probably a data entry mistake that I made). This issue was corrected (proper channel =21). However, the fact remains that it takes up to 7 retries of pressing the "Read Data" button to actually get the data and not get a timeout message
20-Apr	Board calibrated. Was due 4/21/16

Test#	Description	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	P/F Criteria (%)	Pass/Fail	Observations	Notes
4.5.1	No Load	0013500500102B4C	14	Sunrise	SSN	0	0	0	0.000	100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	00135005001D2DDC	12	Sunrise	SSN	19	19	0	0.000	100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	0013500500102A9C	11	Sunrise	SSN	0	0	0	0.000	100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	0013500500102B03	13	Sunrise	SSN	0	0	0	0.000	100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	0013500500102DED	13	Sunrise	SSN	26	26	0		100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	0013500500102D74	12	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	0013500500102DB7	11	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	0013500500103141	14	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	0013500500102A37	11	Sunrise	SSN	1978	1978	0		100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	0013500500102B1F	12	Sunrise	SSN	0	0	0		100.00	0.00	.5% +/- 1Wh		P		
4.5.3	Load Performance (FL)	0013500500102DB7	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.118	100.02	0.02	2.0% +/- 1Wh	10.994	P		
4.5.3	Load Performance (FL)	0013500500102B1F	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.120	100.00	0.00	2.0% +/- 1Wh	10.993	P		
4.5.3	Load Performance (FL)	0013500500102DED	13	Sunrise	IR Pulse	N/A	N/A	11.12	11.122	99.98	-0.02	2.0% +/- 1Wh	10.991	P		
4.5.3	Load Performance (FL)	0013500500103141	14	Sunrise	IR Pulse	N/A	N/A	11.12	11.100	100.18	0.18	2.0% +/- 1Wh	11.009	P		
4.5.3	Load Performance (FL)	0013500500102A37	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.151	99.72	-0.28	2.0% +/- 1Wh	10.968	P	Pulse very difficult to setup on this one.	
4.5.3	Load Performance (FL)	0013500500102D74	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.138	99.84	-0.16	2.0% +/- 1Wh	10.978	P		
4.5.3	Load Performance (FL)	0013500500102B03	13	Sunrise	IR Pulse	N/A	N/A	11.12	11.118	100.02	0.02	2.0% +/- 1Wh	10.994	P		
4.5.3	Load Performance (FL)	0013500500102B4C	14	Sunrise	IR Pulse	N/A	N/A	11.12	11.108	100.11	0.11	2.0% +/- 1Wh	11.003	P		
4.5.3	Load Performance (FL)	00135005001D2DDC	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.114	100.05	0.05	2.0% +/- 1Wh	10.998	P		
4.5.3	Load Performance (FL)	0013500500102A9C	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.117	100.03	0.03	2.0% +/- 1Wh	10.995	P		
4.5.3	Load Performance (FL)	0013500500102B4C	14	Sunrise	SSN	0	1000	1000	1001.706	99.83	-0.17	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (FL)	00135005001D2DDC	12	Sunrise	SSN	19	1019	1000	1001.706	99.83	-0.17	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (FL)	0013500500102A9C	11	Sunrise	SSN	0	999	999	1001.706	99.73	-0.27	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (FL)	0013500500102B03	13	Sunrise	SSN	0	1001	1001	1001.706	99.93	-0.07	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (FL)	0013500500102DED	13	Sunrise	SSN	26	1022	996	1000.883	99.51	-0.49	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (FL)	0013500500102D74	12	Sunrise	SSN	0	996	996	1000.883	99.51	-0.49	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (FL)	0013500500102DB7	11	Sunrise	SSN	0	998	998	1000.883	99.71	-0.29	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (FL)	0013500500103141	14	Sunrise	SSN	0	999	999	1000.883	99.81	-0.19	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (FL)	0013500500102B1F	12	Sunrise	SSN	0	999	999	1002.342	99.67	-0.33	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	0013500500102DB7	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.119	100.01	0.01	2.0% +/- 1Wh	10.994	P		
4.5.3	Load Performance (LL)	0013500500102B1F	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.123	99.97	-0.03	2.0% +/- 1Wh	10.990	P		
4.5.3	Load Performance (LL)	0013500500102DED	13	Sunrise	IR Pulse	N/A	N/A	11.12	11.120	100.00	0.00	2.0% +/- 1Wh	10.993	P		
4.5.3	Load Performance (LL)	0013500500103141	14	Sunrise	IR Pulse	N/A	N/A	11.12	11.099	100.19	0.19	2.0% +/- 1Wh	11.010	P		
4.5.3	Load Performance (LL)	0013500500102A37	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.143	99.79	-0.21	2.0% +/- 1Wh	10.974	P	Pulse very difficult to setup on this one.	
4.5.3	Load Performance (LL)	0013500500102D74	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.137	99.85	-0.15	2.0% +/- 1Wh	10.979	P		
4.5.3	Load Performance (LL)	0013500500102B03	13	Sunrise	IR Pulse	N/A	N/A	11.12	11.112	100.07	0.07	2.0% +/- 1Wh	10.999	P		
4.5.3	Load Performance (LL)	0013500500102B4C	14	Sunrise	IR Pulse	N/A	N/A	11.12	11.114	100.05	0.05	2.0% +/- 1Wh	10.998	P		
4.5.3	Load Performance (LL)	00135005001D2DDC	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.121	99.99	-0.01	2.0% +/- 1Wh	10.992	P		
4.5.3	Load Performance (LL)	0013500500102A9C	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.114	100.05	0.05	2.0% +/- 1Wh	10.998	P		
4.5.3	Load Performance (LL)	0013500500102A9C	11	Sunrise	SSN	1970	2970	1000	1002.249	99.78	-0.22	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	00135005001D2DDC	12	Sunrise	SSN	1990	2989	999	1002.249	99.68	-0.32	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	0013500500102B03	13	Sunrise	SSN	1973	2973	1000	1002.249	99.78	-0.22	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	0013500500102B4C	14	Sunrise	SSN	1973	2973	1000	1002.249	99.78	-0.22	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	0013500500102DED	13	Sunrise	SSN	2047	3046	999	1002.310	99.67	-0.33	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	0013500500102D74	12	Sunrise	SSN	2021	3019	998	1002.310	99.57	-0.43	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	0013500500102DB7	11	Sunrise	SSN	2025	3025	1000	1002.310	99.77	-0.23	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	0013500500103141	14	Sunrise	SSN	2029	3031	1002	1002.310	99.97	-0.03	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	0013500500102A37	11	Sunrise	SSN	3992	4992	1000	1003.353	99.67	-0.33	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	0013500500102B1F	12	Sunrise	SSN	2022	3021	999	1003.353	99.57	-0.43	.5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (PF)	0013500500102DB7	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.111	100.08	0.08	2.0% +/- 1Wh	11.000	P		

Test#	Description	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	P/F Criteria (%)	Pass/Fail	Observations	Notes
4.5.3	Load Performance (PF)	0013500500102B1F	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.116	100.04	0.04	2.0% +/- 1Wh	10.996	P		
4.5.3	Load Performance (PF)	0013500500102DED	13	Sunrise	IR Pulse	N/A	N/A	11.12	11.110	100.09	0.09	2.0% +/- 1Wh	11.001	P		
4.5.3	Load Performance (PF)	0013500500103141	14	Sunrise	IR Pulse	N/A	N/A	11.12	11.090	100.27	0.27	2.0% +/- 1Wh	11.017	P		
4.5.3	Load Performance (PF)	0013500500102A37	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.144	99.78	-0.22	2.0% +/- 1Wh	10.973	P	Pulse very difficult to setup on this one.	
4.5.3	Load Performance (PF)	0013500500102D74	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.126	99.95	-0.05	2.0% +/- 1Wh	10.988	P		
4.5.3	Load Performance (PF)	0013500500102B03	13	Sunrise	IR Pulse	N/A	N/A	11.12	11.105	100.14	0.14	2.0% +/- 1Wh	11.005	P		
4.5.3	Load Performance (PF)	0013500500102B4C	14	Sunrise	IR Pulse	N/A	N/A	11.12	11.100	100.18	0.18	2.0% +/- 1Wh	11.009	P		
4.5.3	Load Performance (PF)	00135005001D2DDC	11	Sunrise	IR Pulse	N/A	N/A	11.12	11.106	100.13	0.13	2.0% +/- 1Wh	11.004	P		
4.5.3	Load Performance (PF)	0013500500102A9C	12	Sunrise	IR Pulse	N/A	N/A	11.12	11.106	100.13	0.13	2.0% +/- 1Wh	11.004	P		
4.5.3	Load Performance (PF)	0013500500102B4C	14	Sunrise	SSN	929	1952	1023	1024.116	99.89	-0.11	.5% +/- 1Wh	0.598	P	how did the wh readings go down here?	
4.5.3	Load Performance (PF)	00135005001D2DDC	12	Sunrise	SSN	947	1969	1022	1024.116	99.79	-0.21	.5% +/- 1Wh	0.598	P	how did the wh readings go down here?	
4.5.3	Load Performance (PF)	0013500500102A9C	11	Sunrise	SSN	928	1950	1022	1024.116	99.79	-0.21	.5% +/- 1Wh	0.598	P	how did the wh readings go down here?	
4.5.3	Load Performance (PF)	0013500500102B03	13	Sunrise	SSN	929	1952	1023	1024.116	99.89	-0.11	.5% +/- 1Wh	0.598	P	how did the wh readings go down here?	
4.5.3	Load Performance (PF)	0013500500102DED	13	Sunrise	SSN	1022	2047	1025	1028.740	99.64	-0.36	.5% +/- 1Wh	0.597	P		
4.5.3	Load Performance (PF)	0013500500102D74	12	Sunrise	SSN	996	2021	1025	1028.740	99.64	-0.36	.5% +/- 1Wh	0.597	P		
4.5.3	Load Performance (PF)	0013500500102DB7	11	Sunrise	SSN	998	2025	1027	1028.740	99.83	-0.17	.5% +/- 1Wh	0.597	P		
4.5.3	Load Performance (PF)	0013500500103141	14	Sunrise	SSN	999	2029	1030	1028.740	100.12	0.12	.5% +/- 1Wh	0.597	P		
4.5.3	Load Performance (PF)	0013500500102B1F	12	Sunrise	SSN	999	2022	1023	1025.489	99.76	-0.24	.5% +/- 1Wh	0.598	P		
4.6.1.2	Effect of variation of voltage (FL)	0013500500102DED	12	Sunrise	SSN	4977	5874	897	900.978	99.56	-0.44	.5% +/- 1Wh	0.611	P		
4.6.1.2	Effect of variation of voltage (FL)	0013500500103141	14	Sunrise	SSN	4967	5868	901	900.978	100.00	0.00	.5% +/- 1Wh	0.611	P		
4.6.1.3	Effect of variation of voltage (FL)	0013500500102D74	11	Sunrise	SSN	6028	7126	1098	1104.093	99.45	-0.55	.5% +/- 1Wh	0.591	P		
4.6.1.3	Effect of variation of voltage (FL)	0013500500102DED	12	Sunrise	SSN	5874	6972	1098	1104.093	99.45	-0.55	.5% +/- 1Wh	0.591	P		
4.6.1.3	Effect of variation of voltage (FL)	0013500500103141	14	Sunrise	SSN	5868	6971	1103	1104.093	99.90	-0.10	.5% +/- 1Wh	0.591	P		
4.6.1.5	Effect of variation of voltage (LL)	0013500500102D74	11	Sunrise	SSN	3239	4137	898	901.668	99.59	-0.41	.5% +/- 1Wh	0.611	P		
4.6.1.5	Effect of variation of voltage (LL)	0013500500102DED	12	Sunrise	SSN	3083	3981	898	901.668	99.59	-0.41	.5% +/- 1Wh	0.611	P		
4.6.1.5	Effect of variation of voltage (LL)	0013500500103141	14	Sunrise	SSN	3068	3967	899	901.668	99.70	-0.30	.5% +/- 1Wh	0.611	P		
4.6.1.6	Effect of variation of voltage (LL)	0013500500102D74	11	Sunrise	SSN	9119	10218	1099	1103.360	99.60	-0.40	.5% +/- 1Wh	0.591	P		
4.6.1.6	Effect of variation of voltage (LL)	0013500500102DED	12	Sunrise	SSN	8966	10064	1098	1103.360	99.51	-0.49	.5% +/- 1Wh	0.591	P		
4.6.1.6	Effect of variation of voltage (LL)	0013500500103141	14	Sunrise	SSN	8974	10076	1102	1103.360	99.88	-0.12	.5% +/- 1Wh	0.591	P		
4.6.2.2	Effect of variation of frequency (FL)	0013500500103141	14	Sunrise	SSN	7972	8974	1002	1002.238	99.97	-0.03	.5% +/- 1Wh	0.600	P		
4.6.2.3	Effect of variation of frequency (FL)	0013500500102D74	11	Sunrise	SSN	7126	8121	995	1001.269	99.59	-0.41	.5% +/- 1Wh	0.600	P		
4.6.2.3	Effect of variation of frequency (FL)	0013500500102A37	13	Sunrise	SSN	9092	10087	995	1001.269	99.59	-0.41	.5% +/- 1Wh	0.600	P		
4.6.2.3	Effect of variation of frequency (FL)	0013500500103141	14	Sunrise	SSN	6971	7972	1001	1001.269	99.79	-0.21	.5% +/- 1Wh	0.600	P		
4.6.2.5	Effect of variation of frequency (LL)	0013500500102D74	11	Sunrise	SSN	10218	11217	999	1003.110	99.59	-0.41	.5% +/- 1Wh	0.600	P		
4.6.2.5	Effect of variation of frequency (LL)	0013500500102DED	12	Sunrise	SSN	10064	11064	1000	1003.110	99.69	-0.31	.5% +/- 1Wh	0.600	P		
4.6.2.5	Effect of variation of frequency (LL)	0013500500102A37	13	Sunrise	SSN	12179	13178	999	1003.110	99.59	-0.41	.5% +/- 1Wh	0.600	P		
4.6.2.5	Effect of variation of frequency (LL)	0013500500103141	14	Sunrise	SSN	10076	11077	1001	1003.110	99.79	-0.21	.5% +/- 1Wh	0.600	P		
4.6.2.6	Effect of variation of frequency (LL)	0013500500102D74	11	Sunrise	SSN	11217	12214	997	1002.969	99.40	-0.60	.5% +/- 1Wh	0.600	P		
4.6.2.6	Effect of variation of frequency (LL)	0013500500102DED	12	Sunrise	SSN	11064	12063	999	1002.969	99.60	-0.40	.5% +/- 1Wh	0.600	P		
4.6.2.6	Effect of variation of frequency (LL)	0013500500102A37	13	Sunrise	SSN	13178	14176	998	1002.969	99.50	-0.50	.5% +/- 1Wh	0.600	P		
4.6.2.6	Effect of variation of frequency (LL)	0013500500103141	14	Sunrise	SSN	11077	12078	1001	1002.969	99.80	-0.20	.5% +/- 1Wh	0.600	P		
4.6.3	Additional Test (+15%) Volts (FL)	0013500500102D74	11	Sunrise	SSN	12214	13335	1121	1127.210	99.45	-0.55	.5% +/- 1Wh	0.589	P		
4.6.3	Additional Test (+15%) Volts (FL)	0013500500102DB7	12	Sunrise	SSN	3062	4186	1124	1127.210	99.72	-0.28	.5% +/- 1Wh	0.589	P		
4.6.3	Additional Test (+15%) Volts (FL)	0013500500102B4C	13	Sunrise	SSN	3180	4304	1124	1127.210	99.72	-0.28	.5% +/- 1Wh	0.589	P		
4.6.3	Additional Test (+15%) Volts (FL)	0013500500102DED	14	Sunrise	SSN	12063	13185	1122	1127.210	99.54	-0.46	.5% +/- 1Wh	0.589	P		
4.6.3	Additional Test (+20%) Volts (FL)	0013500500102DB7	12	Sunrise	SSN	4186	5386	1200	1203.706	99.69	-0.31	.5% +/- 1Wh	0.583	P		
4.6.3	Additional Test (+20%) Volts (FL)	0013500500102B4C	13	Sunrise	SSN	4304	5503	1199	1203.706	99.61	-0.39	.5% +/- 1Wh	0.583	P		
4.6.3	Additional Test (+20%) Volts (FL)	0013500500102DED	14	Sunrise	SSN	13185	14383	1198	1203.706	99.53	-0.47	.5% +/- 1Wh	0.583	P		
4.6.3	Additional Test (-15%) Volts (FL)	0013500500102D74	11	Sunrise	SSN	14531	15377	846	850.808	99.43	-0.57	.5% +/- 1Wh	0.618	P		
4.6.3	Additional Test (-15%) Volts (FL)	0013500500102DB7	12	Sunrise	SSN	5386	6234	848	850.808	99.67	-0.33	.5% +/- 1Wh	0.618	P		

Test#	Description	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	P/F Criteria (%)	Pass/Fail	Observations	Notes
4.6.3	Additional Test (-15%) Volts (FL)	0013500500102B4C	13	Sunrise	SSN	5503	6353	850	850.808	99.91	-0.09	.5% +/- 1Wh	0.618	P		
4.6.3	Additional Test (-15%) Volts (FL)	0013500500102DED	14	Sunrise	SSN	14383	15230	847	850.808	99.55	-0.45	.5% +/- 1Wh	0.618	P		
4.6.3	Additional Test (-20%) Volts (FL)	0013500500102DB7	12	Sunrise	SSN	6234	7032	798	800.272	99.72	-0.28	.5% +/- 1Wh	0.625	P		
4.6.3	Additional Test (-20%) Volts (FL)	0013500500102B4C	13	Sunrise	SSN	6353	7151	798	800.272	99.72	-0.28	.5% +/- 1Wh	0.625	P		
4.6.3	Additional Test (-20%) Volts (FL)	0013500500102D74	11	Sunrise	SSN	15377	16174	797	800.272	99.59	-0.41	.5% +/- 1Wh	0.625	P		
4.6.3	Additional Test (-20%) Volts (FL)	0013500500102DED	14	Sunrise	SSN	15230	16026	796	800.272	99.47	-0.53	.5% +/- 1Wh	0.625	P		
4.6.4	Additional Test (0.5A)	0013500500102B4C	13	Sunrise	SSN	8127	9128	1001	1003.727	99.73	-0.27	.5% +/- 1Wh	0.600	P		
4.6.4	Additional Test (0.5A)	0013500500102DED	14	Sunrise	SSN	17000	17999	999	1003.727	99.53	-0.47	.5% +/- 1Wh	0.600	P		
4.6.4	Additional Test (0.5A)	0013500500102DB7	12	Sunrise	SSN	8008	9006	998	1003.727	99.43	-0.57	.5% +/- 1Wh	0.600	P		
4.6.4	Additional Test (15A)	0013500500102B4C	13	Sunrise	SSN	7151	8127	976	979.504	99.64	-0.36	.5% +/- 1Wh	0.602	P		
4.6.4	Additional Test (15A)	0013500500102DED	14	Sunrise	SSN	16026	17000	974	979.504	99.44	-0.56	.5% +/- 1Wh	0.602	P		
4.6.4	Additional Test (15A)	0013500500102DB7	12	Sunrise	SSN	7032	8008	976	979.504	99.64	-0.36	.5% +/- 1Wh	0.602	P		

Test#	Description	Node ID	Socket #	Manufacturer	Method	Error %	Expected	P/F Criteria (%)	Pass/Fail	Observations	Notes
4.5.2	Starting Load	0013500500102B4C	14	Sunrise	SSN	0.00	.5% +/- 1Wh		F	current set to 10mA; node read 36mA; Watts registered 1W. Spec says min volts =105	
4.5.2	Starting Load	00135005001D2DDC	12	Sunrise	SSN	0.00	.5% +/- 1Wh		F	current set to 10mA; node read 36mA; Watts registered 1W. Spec says min volts =105	
4.5.2	Starting Load	0013500500102A9C	11	Sunrise	SSN	0.00	.5% +/- 1Wh		F	current set to 10mA; node read 36mA; Watts registered 1W. Spec says min volts =105	
4.5.2	Starting Load	0013500500102B03	13	Sunrise	SSN	0.00	.5% +/- 1Wh		F	current set to 10mA; node read 36mA; Watts registered 1W. Spec says min volts =105	
4.5.2	Starting Load	0013500500102DED	13	Sunrise	SSN	0.00	.5% +/- 1Wh		F	A set to 10mA, node read 36mA. W read 1W	
4.5.2	Starting Load	0013500500102D74	12	Sunrise	SSN	0.00	.5% +/- 1Wh		F	A set to 10mA, node read 36mA. W read 1W	
4.5.2	Starting Load	0013500500102DB7	11	Sunrise	SSN	0.00	.5% +/- 1Wh		F	A set to 10mA, node read 37mA. W read 1W	
4.5.2	Starting Load	0013500500103141	14	Sunrise	SSN	0.00	.5% +/- 1Wh		F	A set to 10mA, node read 38mA. W read 1W	
4.5.2	Starting Load	0013500500102A37	11	Sunrise	SSN	0.00	.5% +/- 1Wh		F	A set to 10mA, node read 37mA. W read 1W	
4.5.2	Starting Load	0013500500102B1F	12	Sunrise	SSN	0.00	.5% +/- 1Wh		F	A set to 10mA, node read 38mA. W read 1W	
4.5.3	Load Performance (FL)	0013500500102A37	11	Sunrise	SSN	-0.73	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (PF)	0013500500102A37	11	Sunrise	SSN	-0.63	.5% +/- 1Wh	0.598	F		
4.6.1.2	Effect of variation of voltage (FL)	0013500500102D74	11	Sunrise	SSN	-0.66	.5% +/- 1Wh	0.611	F		
4.6.1.2	Effect of variation of voltage (FL)	0013500500102A37	13	Sunrise	SSN	-0.77	.5% +/- 1Wh	0.611	F		
4.6.1.3	Effect of variation of voltage (FL)	0013500500102A37	13	Sunrise	SSN	-0.73	.5% +/- 1Wh	0.591	F		
4.6.1.5	Effect of variation of voltage (LL)	0013500500102A37	13	Sunrise	SSN	-0.74	.5% +/- 1Wh	0.611	F		
4.6.1.6	Effect of variation of voltage (LL)	0013500500102A37	13	Sunrise	SSN	-0.67	.5% +/- 1Wh	0.591	F		
4.6.2.2	Effect of variation of frequency (FL)	0013500500102D74	11	Sunrise	SSN	-0.64	.5% +/- 1Wh	0.600	F		
4.6.2.2	Effect of variation of frequency (FL)	0013500500102A37	13	Sunrise	SSN	-1.07	.5% +/- 1Wh	0.600	F		
4.6.2.2	Effect of variation of frequency (FL)	0013500500102DED	12	Sunrise	SSN	-0.36	.5% +/- 1Wh	0.600	P		
4.6.2.3	Effect of variation of frequency (FL)	0013500500102DED	12	Sunrise	SSN	-0.24	.5% +/- 1Wh	0.600	P		
4.6.3	Additional Test (+20%) Volts (FL)	0013500500102D74	11	Sunrise	SSN	-0.64	.5% +/- 1Wh	0.583	F		
4.6.4	Additional Test (0.5A)	0013500500102D74	11	Sunrise	SSN	-1.07	.5% +/- 1Wh	0.600	F		
4.6.4	Additional Test (15A)	0013500500102D74	11	Sunrise	SSN	-0.87	.5% +/- 1Wh	0.602	F		

Date	Time	Test#	Description	Volts	Frequency	Amps	Power Factor	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	Observations	Notes
03/23/16	12:40:00	4.5.1	No Load	120	60	0	1.00	001350050011D7D7	11	SELC	SSN	1	1	0	0.000	100.00	0.00	.5% +/- 1Wh		
03/23/16	12:40:00	4.5.1	No Load	120	60	0	1.00	001350050011E20C	13	SELC	SSN	4	4	0	0.000	100.00	0.00	.5% +/- 1Wh		
03/23/16	12:40:00	4.5.1	No Load	120	60	0	1.00	001350050011CD82	14	SELC	SSN	1	1	0	0.000	100.00	0.00	.5% +/- 1Wh		
03/23/16	12:40:00	4.5.1	No Load	120	60	0	1.00	001350050012538A	12	SELC	SSN	1	1	0	0.000	100.00	0.00	.5% +/- 1Wh		
03/23/16	12:50:00	4.5.2	Starting Load	105	60	0.01	1.00	001350050011D7D7	11	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh	current and voltage readings dead on; Watts registered at 1W. Spec says min volts=105	
03/23/16	12:50:00	4.5.2	Starting Load	105	60	0.01	1.00	001350050011E20C	13	SELC	SSN	4	4	0		100.00	0.00	.5% +/- 1Wh	current and voltage readings dead on; Watts registered at 1W. Spec says min volts=105	
03/23/16	12:50:00	4.5.2	Starting Load	105	60	0.01	1.00	001350050011CD82	14	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh	current and voltage readings dead on; Watts registered at 1W. Spec says min volts=105	
03/23/16	12:50:00	4.5.2	Starting Load	105	60	0.01	1.00	001350050012538A	12	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh	current and voltage readings dead on; Watts registered at 1W. Spec says min volts=105	
03/23/16	13:00:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350050011D7D7	11	SELC	SSN	1	1016	1015	1002.670	101.23	1.23	.5% +/- 1Wh		
03/23/16	13:00:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350050011E20C	13	SELC	SSN	4	1020	1016	1002.670	101.33	1.33	.5% +/- 1Wh		
03/23/16	13:00:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350050011CD82	14	SELC	SSN	1	1017	1016	1002.670	101.33	1.33	.5% +/- 1Wh		
03/23/16	13:00:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350050012538A	12	SELC	SSN	1	1020	1019	1002.670	101.63	1.63	.5% +/- 1Wh		
03/23/16	13:55:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350050011D7D7	11	SELC	SSN	1016	2058	1042	1026.565	101.50	1.50	.5% +/- 1Wh		
03/23/16	13:55:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350050011E20C	13	SELC	SSN	1020	2063	1043	1026.565	101.60	1.60	.5% +/- 1Wh		
03/23/16	13:55:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350050011CD82	14	SELC	SSN	1017	2059	1042	1026.565	101.50	1.50	.5% +/- 1Wh		
03/23/16	13:55:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350050012538A	12	SELC	SSN	1020	2066	1046	1026.565	101.89	1.89	.5% +/- 1Wh		
03/23/16	15:40:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350050011D7D7	11	SELC	SSN	2058	3070	1012	1004.054	100.79	0.79	.5% +/- 1Wh		
03/23/16	15:40:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350050011E20C	13	SELC	SSN	2063	3077	1014	1004.054	100.99	0.99	.5% +/- 1Wh		
03/23/16	15:40:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350050011CD82	14	SELC	SSN	2059	3071	1012	1004.054	100.79	0.79	.5% +/- 1Wh		
03/23/16	15:40:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350050012538A	12	SELC	SSN	2066	3081	1015	1004.054	101.09	1.09	.5% +/- 1Wh		
03/31/16	9:25:00	4.5.1	No Load	120	60	0	1.00	00135005001D7DA	14	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh		
03/31/16	9:25:00	4.5.1	No Load	120	60	0	1.00	001350050011E202	13	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh		
03/31/16	9:35:00	4.5.2	Starting Load	105	60	0.01	1.00	00135005001D7DA	14	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh	A set to 10mA, node read 10mA. W read 1W	
03/31/16	9:35:00	4.5.2	Starting Load	105	60	0.01	1.00	001350050011E202	13	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh	A set to 10mA, node read 10mA. W read 1W	
03/31/16	9:45:00	4.5.3	Load Performance (FL)	120	60	10	1.00	00135005001D7DA	14	SELC	SSN	1	1016	1015	1002.342	101.26	1.26	.5% +/- 1Wh		
03/31/16	9:45:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350050011E202	13	SELC	SSN	1	1017	1016	1002.342	101.36	1.36	.5% +/- 1Wh		
03/31/16	11:00:00	4.5.3	Load Performance (PF)	120	60	10	0.50	00135005001D7DA	14	SELC	SSN	1016	2057	1041	1025.489	101.51	1.51	.5% +/- 1Wh		
03/31/16	11:00:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350050011E202	13	SELC	SSN	1017	2059	1042	1025.489	101.61	1.61	.5% +/- 1Wh		
03/31/16	12:30:00	4.5.3	Load Performance (LL)	120	60	1	1.00	00135005001D7DA	14	SELC	SSN	2057	3069	1012	1003.353	100.86	0.86	.5% +/- 1Wh		
03/31/16	12:30:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350050011E202	13	SELC	SSN	2059	3071	1012	1003.353	100.86	0.86	.5% +/- 1Wh		
04/01/16	10:50:00	4.5.1	No Load	120	60	0	1.00	001350050011DFD7	12	SELC	SSN	2	2	0		100.00	0.00	.5% +/- 1Wh		
04/01/16	10:50:00	4.5.1	No Load	120	60	0	1.00	0013500500125225	11	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh		
04/01/16	10:50:00	4.5.1	No Load	120	60	0	1.00	001350050011D7BC	13	SELC	SSN	9	9	0		100.00	0.00	.5% +/- 1Wh		
04/01/16	10:50:00	4.5.1	No Load	120	60	0	1.00	001350050011D0A9	14	SELC	SSN	2	2	0		100.00	0.00	.5% +/- 1Wh		
04/01/16	11:30:00	4.5.2	Starting Load	105	60	0.01	1.00	001350050011DFD7	12	SELC	SSN	2	2	0		100.00	0.00	.5% +/- 1Wh	A set to 10mA, node read 10mA. W read 1W	
04/01/16	11:30:00	4.5.2	Starting Load	105	60	0.01	1.00	0013500500125225	11	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh	A set to 10mA, node read 10mA. W read 1W	
04/01/16	11:30:00	4.5.2	Starting Load	105	60	0.01	1.00	001350050011D7BC	13	SELC	SSN	9	9	0		100.00	0.00	.5% +/- 1Wh	A set to 10mA, node read 10mA. W read 1W	
04/01/16	11:30:00	4.5.2	Starting Load	105	60	0.01	1.00	001350050011D0A9	14	SELC	SSN	2	2	0		100.00	0.00	.5% +/- 1Wh	A set to 10mA, node read 10mA. W read 1W	
04/01/16	11:45:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350050011DFD7	12	SELC	SSN	2	956	954		100.00	0.00	.5% +/- 1Wh	Aborted test, had to update computer	
04/01/16	11:45:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500125225	11	SELC	SSN	1	957	956		100.00	0.00	.5% +/- 1Wh	Aborted test, had to update computer	
04/01/16	11:45:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350050011D7BC	13	SELC	SSN	9	964	955		100.00	0.00	.5% +/- 1Wh	Aborted test, had to update computer	
04/01/16	11:45:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350050011D0A9	14	SELC	SSN	2	958	956		100.00	0.00	.5% +/- 1Wh	Aborted test, had to update computer	
04/01/16	12:30:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350050011DFD7	12	SELC	SSN	956	1975	1019	1002.741	101.62	1.62	.5% +/- 1Wh		
04/01/16	12:30:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500500125225	11	SELC	SSN	957	1979	1022	1002.741	101.92	1.92	.5% +/- 1Wh		
04/01/16	12:30:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350050011D7BC	13	SELC	SSN	964	1984	1020	1002.741	101.72	1.72	.5% +/- 1Wh		
04/01/16	12:30:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350050011D0A9	14	SELC	SSN	958	1979	1021	1002.741	101.82	1.82	.5% +/- 1Wh		
04/01/16	13:50:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350050011DFD7	12	SELC	SSN	1975	3022	1047	1028.424	101.81	1.81	.5% +/- 1Wh		
04/01/16	13:50:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500500125225	11	SELC	SSN	1979	3028	1049	1028.424	102.00	2.00	.5% +/- 1Wh		
04/01/16	13:50:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350050011D7BC	13	SELC	SSN	1984	3032	1048	1028.424	101.90	1.90	.5% +/- 1Wh		
04/01/16	13:50:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350050011D0A9	14	SELC	SSN	1979	3027	1048	1028.424	101.90	1.90	.5% +/- 1Wh		
04/01/16	16:40:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350050011DFD7	12	SELC	SSN	3022	4037	1015	1004.160	101.08	1.08	.5% +/- 1Wh		
04/01/16	16:40:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500500125225	11	SELC	SSN	3028	4044	1016	1004.160	101.18	1.18	.5% +/- 1Wh		
04/01/16	16:40:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350050011D7BC	13	SELC	SSN	3032	4048	1016	1004.160	101.18	1.18	.5% +/- 1Wh		
04/01/16	16:40:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350050011D0A9	14	SELC	SSN	3027	4044	1017	1004.160	101.28	1.28	.5% +/- 1Wh		

Date	Time	Test#	Description	Volts	Frequency	Amps	Power Factor	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	Observations	Notes
04/25/16	9:25:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	001350050011CD82	12	SEL	SSN	3071	3986	915	902.842	101.35	1.35	.5% +/- 1Wh		
04/25/16	9:25:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	001350050011E20C	14	SEL	SSN	3077	3992	915	902.842	101.35	1.35	.5% +/- 1Wh		
04/25/16	9:25:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	001350050011D7D7	11	SEL	SSN	3070	3985	915	902.842	101.35	1.35	.5% +/- 1Wh		
04/25/16	9:25:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	001350050011D7DA	13	SEL	SSN	3069	3984	915	902.842	101.35	1.35	.5% +/- 1Wh		
04/25/16	17:45:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	001350050011CD82	12	SEL	SSN	7147	8059	912	904.134	100.87	0.87	.5% +/- 1Wh		
04/25/16	17:45:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	001350050011E20C	14	SEL	SSN	7153	8066	913	904.134	100.98	0.98	.5% +/- 1Wh		
04/25/16	17:45:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	001350050011D7D7	11	SEL	SSN	7143	8056	913	904.134	100.98	0.98	.5% +/- 1Wh		
04/25/16	17:45:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	001350050011D7DA	13	SEL	SSN	7145	8058	913	904.134	100.98	0.98	.5% +/- 1Wh		
04/25/16	11:30:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	001350050011CD82	12	SEL	SSN	3986	5107	1121	1103.789	101.56	1.56	.5% +/- 1Wh		
04/25/16	11:30:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	001350050011E20C	14	SEL	SSN	3992	5113	1121	1103.789	101.56	1.56	.5% +/- 1Wh		
04/25/16	11:30:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	001350050011D7D7	11	SEL	SSN	3985	5105	1120	1103.789	101.47	1.47	.5% +/- 1Wh		
04/25/16	11:30:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	001350050011D7DA	13	SEL	SSN	3984	5105	1121	1103.789	101.56	1.56	.5% +/- 1Wh		
04/26/16	10:00:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	001350050011CD82	12	SEL	SSN	8059	9173	1114	1105.129	100.80	0.80	.5% +/- 1Wh		
04/26/16	10:00:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	001350050011E20C	14	SEL	SSN	8066	9181	1115	1105.129	100.89	0.89	.5% +/- 1Wh		
04/26/16	10:00:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	001350050011D7D7	11	SEL	SSN	8056	9170	1114	1105.129	100.80	0.80	.5% +/- 1Wh		
04/26/16	10:00:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	001350050011D7DA	13	SEL	SSN	8058	9173	1115	1105.129	100.89	0.89	.5% +/- 1Wh		
04/25/16	13:10:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	001350050011CD82	12	SEL	SSN	5107	6127	1020	1003.895	101.60	1.60	.5% +/- 1Wh		
04/25/16	13:10:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	001350050011E20C	14	SEL	SSN	5113	6134	1021	1003.895	101.70	1.70	.5% +/- 1Wh		
04/25/16	13:10:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	001350050011D7D7	11	SEL	SSN	5105	6124	1019	1003.895	101.50	1.50	.5% +/- 1Wh		
04/25/16	13:10:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	001350050011D7DA	13	SEL	SSN	5105	6126	1021	1003.895	101.70	1.70	.5% +/- 1Wh		
04/25/16	16:40:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	001350050011CD82	12	SEL	SSN	6127	7147	1020	1003.802	101.61	1.61	.5% +/- 1Wh		
04/25/16	16:40:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	001350050011E20C	14	SEL	SSN	6134	7153	1019	1003.802	101.51	1.51	.5% +/- 1Wh		
04/25/16	16:40:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	001350050011D7D7	11	SEL	SSN	6124	7143	1019	1003.802	101.51	1.51	.5% +/- 1Wh		
04/25/16	16:40:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	001350050011D7DA	13	SEL	SSN	6126	7145	1019	1003.802	101.51	1.51	.5% +/- 1Wh		
04/27/16	9:00:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	001350050011CD82	12	SEL	SSN	9173	10186	1013	1004.385	100.86	0.86	.5% +/- 1Wh		
04/27/16	9:00:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	001350050011E20C	14	SEL	SSN	9181	10195	1014	1004.385	100.96	0.96	.5% +/- 1Wh		
04/27/16	9:00:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	001350050011D7D7	11	SEL	SSN	9170	10183	1013	1004.385	100.86	0.86	.5% +/- 1Wh		
04/27/16	9:00:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	001350050011D7DA	13	SEL	SSN	9173	10186	1013	1004.385	100.86	0.86	.5% +/- 1Wh		
04/27/16	18:00:00	4.6.2.6	Effect of variation of frequency (LL)	120	61.2	1	1.00	001350050011CD82	12	SEL	SSN	10186	11198	1012	1004.071	100.79	0.79	.5% +/- 1Wh		
04/27/16	18:00:00	4.6.2.6	Effect of variation of frequency (LL)	120	61.2	1	1.00	001350050011E20C	14	SEL	SSN	10195	11208	1013	1004.071	100.89	0.89	.5% +/- 1Wh		
04/27/16	18:00:00	4.6.2.6	Effect of variation of frequency (LL)	120	61.2	1	1.00	001350050011D7D7	11	SEL	SSN	10183	11195	1012	1004.071	100.79	0.79	.5% +/- 1Wh		
04/27/16	18:00:00	4.6.2.6	Effect of variation of frequency (LL)	120	61.2	1	1.00	001350050011D7DA	13	SEL	SSN	10186	11198	1012	1004.071	100.79	0.79	.5% +/- 1Wh		

Date	Time	Test#	Description	Volts	Frequency	Amps	Power Factor	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	Observations	Notes
05/19/16	10:05:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	001350050012538A	11	SELC	SSN	3081	4261	1180	1160.328	101.70	1.70	.5% +/- 1Wh		
05/19/16	10:05:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	001350050011E20C	12	SELC	SSN	11208	12384	1176	1160.328	101.35	1.35	.5% +/- 1Wh		
05/19/16	10:05:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	001350050011CD82	13	SELC	SSN	11198	12375	1177	1160.328	101.44	1.44	.5% +/- 1Wh		
05/19/16	10:05:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	001350050011DFD7	14	SELC	SSN	4037	5215	1178	1160.328	101.52	1.52	.5% +/- 1Wh		
05/19/16	13:00:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	001350050012538A	11	SELC	SSN	4261	5495	1234	1210.986	101.90	1.90	.5% +/- 1Wh		
05/19/16	13:00:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	001350050011E20C	12	SELC	SSN	12384	13613	1229	1210.986	101.49	1.49	.5% +/- 1Wh		
05/19/16	13:00:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	001350050011CD82	13	SELC	SSN	12375	13604	1229	1210.986	101.49	1.49	.5% +/- 1Wh		
05/19/16	13:00:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	001350050011DFD7	14	SELC	SSN	5215	6446	1231	1210.986	101.65	1.65	.5% +/- 1Wh		
05/19/16	14:40:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	001350050012538A	11	SELC	SSN	5495	6363	868	857.531	101.22	1.22	.5% +/- 1Wh		
05/19/16	14:40:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	001350050011E20C	12	SELC	SSN	13613	14482	869	857.531	101.34	1.34	.5% +/- 1Wh		
05/19/16	14:40:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	001350050011CD82	13	SELC	SSN	13604	14474	870	857.531	101.45	1.45	.5% +/- 1Wh		
05/19/16	14:40:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	001350050011DFD7	14	SELC	SSN	6446	7317	871	857.531	101.57	1.57	.5% +/- 1Wh		
05/19/16	15:40:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	001350050012538A	11	SELC	SSN	6363	7185	822	807.247	101.83	1.83	.5% +/- 1Wh		
05/19/16	15:40:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	001350050011E20C	12	SELC	SSN	14482	15302	820	807.247	101.58	1.58	.5% +/- 1Wh		
05/19/16	15:40:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	001350050011CD82	13	SELC	SSN	14474	15293	819	807.247	101.46	1.46	.5% +/- 1Wh		
05/19/16	15:40:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	001350050011DFD7	14	SELC	SSN	7317	8137	820	807.247	101.58	1.58	.5% +/- 1Wh		
06/10/16	15:15:00	4.6.4	Additional Test (15A)	120	60	15	1.00	001350050011DFD7	14	SELC	SSN	8137	9139	1002	982.120	102.02	2.02	.5% +/- 1Wh		
06/10/16	15:15:00	4.6.4	Additional Test (15A)	120	60	15	1.00	001350050012538A	11	SELC	SSN	7185	8189	1004	982.120	102.23	2.23	.5% +/- 1Wh		
06/10/16	15:15:00	4.6.4	Additional Test (15A)	120	60	15	1.00	001350050011E20C	12	SELC	SSN	15302	16302	1000	982.120	101.82	1.82	.5% +/- 1Wh		
06/10/16	15:15:00	4.6.4	Additional Test (15A)	120	60	15	1.00	001350050011CD82	13	SELC	SSN	15293	16293	1000	982.120	101.82	1.82	.5% +/- 1Wh		
06/10/16	17:00:00	4.6.4	Additional Test (0.5A)	120	60	0.5	1.00	001350050011DFD7	14	SELC	SSN	9139	10154	1015	1004.488	101.05	1.05	.5% +/- 1Wh		
06/10/16	17:00:00	4.6.4	Additional Test (0.5A)	120	60	0.5	1.00	001350050012538A	11	SELC	SSN	8189	9205	1016	1004.488	101.15	1.15	.5% +/- 1Wh		
06/10/16	17:00:00	4.6.4	Additional Test (0.5A)	120	60	0.5	1.00	001350050011E20C	12	SELC	SSN	16302	17316	1014	1004.488	100.95	0.95	.5% +/- 1Wh		
06/10/16	17:00:00	4.6.4	Additional Test (0.5A)	120	60	0.5	1.00	001350050011CD82	13	SELC	SSN	16293	17307	1014	1004.488	100.95	0.95	.5% +/- 1Wh		

Date	Time	Test#	Description	Volts	Frequency	Metered Load (Amps)	Parasitic Load (mA)	Parasitic Load (VA)	Node ID	Socket #	Manufacturer	Method	Observations	Notes
06/13/16	11:00:00	N/A	Parasitic Load	120.257	60	0	7.03	0.845	001350050012538A	11	SELC	SSN		
06/13/16	11:02:00	N/A	Parasitic Load	120.257	60	0	6.89	0.829	001350050011CD82	11	SELC	SSN		
06/13/16	11:04:00	N/A	Parasitic Load	120.257	60	0	6.89	0.829	001350050011E20C	11	SELC	SSN		
06/13/16	11:06:00	N/A	Parasitic Load	120.257	60	0	6.89	0.829	001350050011DFD7	11	SELC	SSN		
06/13/16	11:08:00	N/A	Parasitic Load	120.257	60	0	6.90	0.830	001350050011E20Z	11	SELC	SSN		

Date	Testing Notes
21-Mar	Takes a few minutes for any of these nodes to come online after even a brief (<10sec) power outage
24-Mar	The SELC nodes seem to continue to communicate for a period of time after they have been powered down.
6-Apr	Handheld configurator had been set to wrong channel (probably a data entry mistake that I made). This issue was corrected (proper channel =21). However, the fact remains that it takes up to 7 retries of pressing the "Read Data" button to actually get the data and not get a timeout message
20-Apr	Board calibrated. Was due 4/21/16

Test#	Description	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	P/F Criteria (%)	Pass/Fail	Observations	Notes
4.5.1	No Load	001350050011D7D7	11	SELC	SSN	1	1	0	0.000	100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	001350050011E20C	13	SELC	SSN	4	4	0	0.000	100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	001350050011CD82	14	SELC	SSN	1	1	0	0.000	100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	001350050012538A	12	SELC	SSN	1	1	0	0.000	100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	00135005001D7DA	14	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	001350050011E202	13	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	001350050011DFD7	12	SELC	SSN	2	2	0		100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	0013500500125225	11	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	001350050011D7BC	13	SELC	SSN	9	9	0		100.00	0.00	.5% +/- 1Wh		P		
4.5.1	No Load	001350050011D0A9	14	SELC	SSN	2	2	0		100.00	0.00	.5% +/- 1Wh		P		
4.5.2	Starting Load	001350050011D7D7	11	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh		P	current and voltage readings dead on; Watts registered at 1W. Spec says min volts=105	
4.5.2	Starting Load	001350050011E20C	13	SELC	SSN	4	4	0		100.00	0.00	.5% +/- 1Wh		P	current and voltage readings dead on; Watts registered at 1W. Spec says min volts=105	
4.5.2	Starting Load	001350050011CD82	14	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh		P	current and voltage readings dead on; Watts registered at 1W. Spec says min volts=105	
4.5.2	Starting Load	001350050012538A	12	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh		P	current and voltage readings dead on; Watts registered at 1W. Spec says min volts=105	
4.5.2	Starting Load	00135005001D7DA	14	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh		P	A set to 10mA, node read 10mA. W read 1W	
4.5.2	Starting Load	001350050011E202	13	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh		P	A set to 10mA, node read 10mA. W read 1W	
4.5.2	Starting Load	001350050011DFD7	12	SELC	SSN	2	2	0		100.00	0.00	.5% +/- 1Wh		P	A set to 10mA, node read 10mA. W read 1W	
4.5.2	Starting Load	0013500500125225	11	SELC	SSN	1	1	0		100.00	0.00	.5% +/- 1Wh		P	A set to 10mA, node read 10mA. W read 1W	
4.5.2	Starting Load	001350050011D7BC	13	SELC	SSN	9	9	0		100.00	0.00	.5% +/- 1Wh		P	A set to 10mA, node read 10mA. W read 1W	
4.5.2	Starting Load	001350050011D0A9	14	SELC	SSN	2	2	0		100.00	0.00	.5% +/- 1Wh		P	A set to 10mA, node read 10mA. W read 1W	

Test#	Description	Node ID	Socket #	Manufacturer	Method	Error %	Expected	P/F Criteria (%)	Pass/Fail	Observations	Notes
4.5.3	Load Performance (FL)	001350050011D7D7	11	SELC	SSN	1.23	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350050011E20C	13	SELC	SSN	1.33	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350050011CD82	14	SELC	SSN	1.33	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350050012538A	12	SELC	SSN	1.63	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	00135005001D7DA	14	SELC	SSN	1.26	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350050011E202	13	SELC	SSN	1.36	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350050011DFD7	12	SELC	SSN	1.62	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	0013500500125225	11	SELC	SSN	1.92	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350050011D7BC	13	SELC	SSN	1.72	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350050011D0A9	14	SELC	SSN	1.82	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350050011DFD7	12	SELC	SSN	0.00	.5% +/- 1Wh		NA	Aborted test, had to update computer	
4.5.3	Load Performance (FL)	0013500500125225	11	SELC	SSN	0.00	.5% +/- 1Wh		NA	Aborted test, had to update computer	
4.5.3	Load Performance (FL)	001350050011D7BC	13	SELC	SSN	0.00	.5% +/- 1Wh		NA	Aborted test, had to update computer	
4.5.3	Load Performance (FL)	001350050011D0A9	14	SELC	SSN	0.00	.5% +/- 1Wh		NA	Aborted test, had to update computer	
4.5.3	Load Performance (LL)	001350050011D7D7	11	SELC	SSN	0.79	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (LL)	001350050011E20C	13	SELC	SSN	0.99	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (LL)	001350050011CD82	14	SELC	SSN	0.79	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (LL)	001350050012538A	12	SELC	SSN	1.09	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (LL)	00135005001D7DA	14	SELC	SSN	0.86	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (LL)	001350050011E202	13	SELC	SSN	0.86	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (LL)	001350050011DFD7	12	SELC	SSN	1.08	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (LL)	0013500500125225	11	SELC	SSN	1.18	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (LL)	001350050011D7BC	13	SELC	SSN	1.18	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (LL)	001350050011D0A9	14	SELC	SSN	1.28	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (PF)	001350050011D7D7	11	SELC	SSN	1.50	.5% +/- 1Wh	0.597	F		
4.5.3	Load Performance (PF)	001350050011E20C	13	SELC	SSN	1.60	.5% +/- 1Wh	0.597	F		
4.5.3	Load Performance (PF)	001350050011CD82	14	SELC	SSN	1.50	.5% +/- 1Wh	0.597	F		
4.5.3	Load Performance (PF)	001350050012538A	12	SELC	SSN	1.89	.5% +/- 1Wh	0.597	F		
4.5.3	Load Performance (PF)	00135005001D7DA	14	SELC	SSN	1.51	.5% +/- 1Wh	0.598	F		
4.5.3	Load Performance (PF)	001350050011E202	13	SELC	SSN	1.61	.5% +/- 1Wh	0.598	F		
4.5.3	Load Performance (PF)	001350050011DFD7	12	SELC	SSN	1.81	.5% +/- 1Wh	0.597	F		
4.5.3	Load Performance (PF)	0013500500125225	11	SELC	SSN	2.00	.5% +/- 1Wh	0.597	F		
4.5.3	Load Performance (PF)	001350050011D7BC	13	SELC	SSN	1.90	.5% +/- 1Wh	0.597	F		
4.5.3	Load Performance (PF)	001350050011D0A9	14	SELC	SSN	1.90	.5% +/- 1Wh	0.597	F		
4.6.1.2	Effect of variation of voltage (FL)	001350050011CD82	12	SELC	SSN	1.35	.5% +/- 1Wh	0.611	F		
4.6.1.2	Effect of variation of voltage (FL)	001350050011E20C	14	SELC	SSN	1.35	.5% +/- 1Wh	0.611	F		
4.6.1.2	Effect of variation of voltage (FL)	001350050011D7D7	11	SELC	SSN	1.35	.5% +/- 1Wh	0.611	F		
4.6.1.2	Effect of variation of voltage (FL)	001350050011D7DA	13	SELC	SSN	1.35	.5% +/- 1Wh	0.611	F		
4.6.1.3	Effect of variation of voltage (FL)	001350050011CD82	12	SELC	SSN	1.56	.5% +/- 1Wh	0.591	F		
4.6.1.3	Effect of variation of voltage (FL)	001350050011E20C	14	SELC	SSN	1.56	.5% +/- 1Wh	0.591	F		
4.6.1.3	Effect of variation of voltage (FL)	001350050011D7D7	11	SELC	SSN	1.47	.5% +/- 1Wh	0.591	F		
4.6.1.3	Effect of variation of voltage (FL)	001350050011D7DA	13	SELC	SSN	1.56	.5% +/- 1Wh	0.591	F		
4.6.1.5	Effect of variation of voltage (LL)	001350050011CD82	12	SELC	SSN	0.87	.5% +/- 1Wh	0.611	F		
4.6.1.5	Effect of variation of voltage (LL)	001350050011E20C	14	SELC	SSN	0.98	.5% +/- 1Wh	0.611	F		
4.6.1.5	Effect of variation of voltage (LL)	001350050011D7D7	11	SELC	SSN	0.98	.5% +/- 1Wh	0.611	F		
4.6.1.5	Effect of variation of voltage (LL)	001350050011D7DA	13	SELC	SSN	0.98	.5% +/- 1Wh	0.611	F		
4.6.1.6	Effect of variation of voltage (LL)	001350050011CD82	12	SELC	SSN	0.80	.5% +/- 1Wh	0.590	F		

Test#	Description	Node ID	Socket #	Manufacturer	Method	Error %	Expected	P/F Criteria (%)	Pass/Fail	Observations	Notes
4.6.1.6	Effect of variation of voltage (LL)	001350050011E20C	14	SELC	SSN	0.89	.5% +/- 1Wh	0.590	F		
4.6.1.6	Effect of variation of voltage (LL)	001350050011D7D7	11	SELC	SSN	0.80	.5% +/- 1Wh	0.590	F		
4.6.1.6	Effect of variation of voltage (LL)	001350050011D7DA	13	SELC	SSN	0.89	.5% +/- 1Wh	0.590	F		
4.6.2.2	Effect of variation of frequency (FL)	001350050011CD82	12	SELC	SSN	1.60	.5% +/- 1Wh	0.600	F		
4.6.2.2	Effect of variation of frequency (FL)	001350050011E20C	14	SELC	SSN	1.70	.5% +/- 1Wh	0.600	F		
4.6.2.2	Effect of variation of frequency (FL)	001350050011D7D7	11	SELC	SSN	1.50	.5% +/- 1Wh	0.600	F		
4.6.2.2	Effect of variation of frequency (FL)	001350050011D7DA	13	SELC	SSN	1.70	.5% +/- 1Wh	0.600	F		
4.6.2.3	Effect of variation of frequency (FL)	001350050011CD82	12	SELC	SSN	1.61	.5% +/- 1Wh	0.600	F		
4.6.2.3	Effect of variation of frequency (FL)	001350050011E20C	14	SELC	SSN	1.51	.5% +/- 1Wh	0.600	F		
4.6.2.3	Effect of variation of frequency (FL)	001350050011D7D7	11	SELC	SSN	1.51	.5% +/- 1Wh	0.600	F		
4.6.2.3	Effect of variation of frequency (FL)	001350050011D7DA	13	SELC	SSN	1.51	.5% +/- 1Wh	0.600	F		
4.6.2.5	Effect of variation of frequency (LL)	001350050011CD82	12	SELC	SSN	0.86	.5% +/- 1Wh	0.600	F		
4.6.2.5	Effect of variation of frequency (LL)	001350050011E20C	14	SELC	SSN	0.96	.5% +/- 1Wh	0.600	F		
4.6.2.5	Effect of variation of frequency (LL)	001350050011D7D7	11	SELC	SSN	0.86	.5% +/- 1Wh	0.600	F		
4.6.2.5	Effect of variation of frequency (LL)	001350050011D7DA	13	SELC	SSN	0.86	.5% +/- 1Wh	0.600	F		
4.6.2.6	Effect of variation of frequency (LL)	001350050011CD82	12	SELC	SSN	0.79	.5% +/- 1Wh	0.600	F		
4.6.2.6	Effect of variation of frequency (LL)	001350050011E20C	14	SELC	SSN	0.89	.5% +/- 1Wh	0.600	F		
4.6.2.6	Effect of variation of frequency (LL)	001350050011D7D7	11	SELC	SSN	0.79	.5% +/- 1Wh	0.600	F		
4.6.2.6	Effect of variation of frequency (LL)	001350050011D7DA	13	SELC	SSN	0.79	.5% +/- 1Wh	0.600	F		
4.6.3	Additional Test (+15%) Volts (FL)	001350050012538A	11	SELC	SSN	1.70	.5% +/- 1Wh	0.586	F		
4.6.3	Additional Test (+15%) Volts (FL)	001350050011E20C	12	SELC	SSN	1.35	.5% +/- 1Wh	0.586	F		
4.6.3	Additional Test (+15%) Volts (FL)	001350050011CD82	13	SELC	SSN	1.44	.5% +/- 1Wh	0.586	F		
4.6.3	Additional Test (+15%) Volts (FL)	001350050011DFD7	14	SELC	SSN	1.52	.5% +/- 1Wh	0.586	F		
4.6.3	Additional Test (+20%) Volts (FL)	001350050012538A	11	SELC	SSN	1.90	.5% +/- 1Wh	0.583	F		
4.6.3	Additional Test (+20%) Volts (FL)	001350050011E20C	12	SELC	SSN	1.49	.5% +/- 1Wh	0.583	F		
4.6.3	Additional Test (+20%) Volts (FL)	001350050011CD82	13	SELC	SSN	1.49	.5% +/- 1Wh	0.583	F		
4.6.3	Additional Test (+20%) Volts (FL)	001350050011DFD7	14	SELC	SSN	1.65	.5% +/- 1Wh	0.583	F		
4.6.3	Additional Test (-15%) Volts (FL)	001350050012538A	11	SELC	SSN	1.22	.5% +/- 1Wh	0.617	F		
4.6.3	Additional Test (-15%) Volts (FL)	001350050011E20C	12	SELC	SSN	1.34	.5% +/- 1Wh	0.617	F		
4.6.3	Additional Test (-15%) Volts (FL)	001350050011CD82	13	SELC	SSN	1.45	.5% +/- 1Wh	0.617	F		
4.6.3	Additional Test (-15%) Volts (FL)	001350050011DFD7	14	SELC	SSN	1.57	.5% +/- 1Wh	0.617	F		
4.6.3	Additional Test (-20%) Volts (FL)	001350050012538A	11	SELC	SSN	1.83	.5% +/- 1Wh	0.624	F		
4.6.3	Additional Test (-20%) Volts (FL)	001350050011E20C	12	SELC	SSN	1.58	.5% +/- 1Wh	0.624	F		
4.6.3	Additional Test (-20%) Volts (FL)	001350050011CD82	13	SELC	SSN	1.46	.5% +/- 1Wh	0.624	F		
4.6.3	Additional Test (-20%) Volts (FL)	001350050011DFD7	14	SELC	SSN	1.58	.5% +/- 1Wh	0.624	F		
4.6.4	Additional Test (0.5A)	001350050011DFD7	14	SELC	SSN	1.05	.5% +/- 1Wh	0.600	F		
4.6.4	Additional Test (0.5A)	001350050012538A	11	SELC	SSN	1.15	.5% +/- 1Wh	0.600	F		
4.6.4	Additional Test (0.5A)	001350050011E20C	12	SELC	SSN	0.95	.5% +/- 1Wh	0.600	F		
4.6.4	Additional Test (0.5A)	001350050011CD82	13	SELC	SSN	0.95	.5% +/- 1Wh	0.600	F		
4.6.4	Additional Test (15A)	001350050011DFD7	14	SELC	SSN	2.02	.5% +/- 1Wh	0.602	F		
4.6.4	Additional Test (15A)	001350050012538A	11	SELC	SSN	2.23	.5% +/- 1Wh	0.602	F		
4.6.4	Additional Test (15A)	001350050011E20C	12	SELC	SSN	1.82	.5% +/- 1Wh	0.602	F		
4.6.4	Additional Test (15A)	001350050011CD82	13	SELC	SSN	1.82	.5% +/- 1Wh	0.602	F		

Date	Time	Test#	Description	Volts	Frequency	Amps	Power Factor	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	Observations	Notes	
03/17/16	13:50:00	4.5.1	No Load	120	60	0	1.00	0013500300578EC8	13	CIMCON	SSN	28524	28524	0	0.000	100.00	0.00	5% +/- 1Wh			
03/17/16	13:50:00	4.5.1	No Load	120	60	0	1.00	001350030055EAED	11	CIMCON	SSN	28204	28204	0	0.000	100.00	0.00	5% +/- 1Wh			
03/17/16	13:50:00	4.5.1	No Load	120	60	0	1.00	001350030055EA20	12	CIMCON	SSN	28347	28347	0	0.000	100.00	0.00	5% +/- 1Wh			
03/17/16	13:50:00	4.5.1	No Load	120	60	0	1.00	001350030057D29A	14	CIMCON	SSN	27826	27826	0	0.000	100.00	0.00	5% +/- 1Wh			
03/17/16	14:07:00	4.5.2	Starting Load	85	60	0.01	1.00	0013500300578EC8	13	CIMCON	SSN	28524	28524	0		100.00	0.00	5% +/- 1Wh	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	Spec says min volts =85	
03/17/16	14:07:00	4.5.2	Starting Load	85	60	0.01	1.00	001350030055EAED	11	CIMCON	SSN	28204	28204	0		100.00	0.00	5% +/- 1Wh	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	Spec says min volts =85	
03/17/16	14:07:00	4.5.2	Starting Load	85	60	0.01	1.00	001350030055EA20	12	CIMCON	SSN	28347	28347	0		100.00	0.00	5% +/- 1Wh	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	Spec says min volts =85	
03/17/16	14:07:00	4.5.2	Starting Load	85	60	0.01	1.00	001350030057D29A	14	CIMCON	SSN	27826	27826	0		100.00	0.00	5% +/- 1Wh	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	Spec says min volts =85	
03/17/16	14:55:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350030057D29A	14	CIMCON	SSN	27907	28840	933	1000.362	93.27	-6.73	5% +/- 1Wh			
03/17/16	14:55:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350030055EA20	12	CIMCON	SSN	28429	29363	934	1000.362	93.37	-6.63	5% +/- 1Wh			
03/17/16	14:55:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350030055EAED	11	CIMCON	SSN	28286	29222	936	1000.362	93.57	-6.43	5% +/- 1Wh			
03/17/16	14:55:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500300578EC8	13	CIMCON	SSN	28605	29542	937	1000.362	93.67	-6.33	5% +/- 1Wh			
03/17/16	16:47:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350030057D29A	14	CIMCON	SSN	28840	28940	100	100.062	99.94	-0.06	5% +/- 1Wh			
03/17/16	16:47:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350030055EA20	12	CIMCON	SSN	29363	29463	100	100.062	99.94	-0.06	5% +/- 1Wh			
03/17/16	16:47:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350030055EAED	11	CIMCON	SSN	29222	29322	100	100.062	99.94	-0.06	5% +/- 1Wh			
03/17/16	16:47:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500300578EC8	13	CIMCON	SSN	29542	29642	100	100.062	99.94	-0.06	5% +/- 1Wh			
03/18/16	9:15:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350030057D29A	14	CIMCON	SSN	28940	30058	1118	1204.832	92.79	-7.21	5% +/- 1Wh			
03/18/16	9:15:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350030055EA20	12	CIMCON	SSN	29463	30583	1120	1204.832	92.96	-7.04	5% +/- 1Wh			
03/18/16	9:15:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350030055EAED	11	CIMCON	SSN	29322	30444	1122	1204.832	93.13	-6.87	5% +/- 1Wh			
03/18/16	9:15:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500300578EC8	13	CIMCON	SSN	29642	30767	1125	1204.832	93.37	-6.63	5% +/- 1Wh			
03/24/16	10:45:00	4.5.1	No Load	120	60	0	1.00	001350030057D299	12	CIMCON	SSN	27966	27966	0		100.00	0.00	5% +/- 1Wh			
03/24/16	10:45:00	4.5.1	No Load	120	60	0	1.00	001350030055EA21	11	CIMCON	SSN	0	0	0		100.00	0.00	5% +/- 1Wh			
03/24/16	10:45:00	4.5.1	No Load	120	60	0	1.00	001350030057C67E	13	CIMCON	SSN	27797	27797	0		100.00	0.00	5% +/- 1Wh			
03/24/16	10:45:00	4.5.1	No Load	120	60	0	1.00	001350030055EB8B	14	CIMCON	SSN	27756	27756	0		100.00	0.00	5% +/- 1Wh			
03/24/16	11:00:00	4.5.2	Starting Load	85	60	0.01	1.00	001350030057D299	12	CIMCON	SSN	27966	27966	0		100.00	0.00	5% +/- 1Wh	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node		
03/24/16	11:00:00	4.5.2	Starting Load	85	60	0.01	1.00	001350030055EA21	11	CIMCON	SSN	0	0	0		100.00	0.00	5% +/- 1Wh	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	Unit faulted out at 85V; relay opened up	
03/24/16	11:00:00	4.5.2	Starting Load	85	60	0.01	1.00	001350030057C67E	13	CIMCON	SSN	27797	27797	0		100.00	0.00	5% +/- 1Wh	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node		
03/24/16	11:00:00	4.5.2	Starting Load	85	60	0.01	1.00	001350030055EB8B	14	CIMCON	SSN	27756	27756	0		100.00	0.00	5% +/- 1Wh	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node		
03/24/16	11:10:00	4.5.2	Starting Load	105	60	0.01	1.00	001350030055EA21	11	CIMCON	SSN	0	0	0		100.00	0.00	5% +/- 1Wh	Reran test at 105V, same results		
03/24/16	11:10:00	4.5.2	Starting Load	105	60	0.01	1.00	001350030057C67E	13	CIMCON	SSN	27797	27797	0		100.00	0.00	5% +/- 1Wh	Reran test at 105V, same results	Unit faulted out at 85V; relay opened up	
03/24/16	11:10:00	4.5.2	Starting Load	105	60	0.01	1.00	001350030057D299	12	CIMCON	SSN	27966	27966	0		100.00	0.00	5% +/- 1Wh	Reran test at 105V, same results		
03/24/16	11:10:00	4.5.2	Starting Load	105	60	0.01	1.00	001350030055EB8B	14	CIMCON	SSN	27756	27756	0		100.00	0.00	5% +/- 1Wh	Reran test at 105V, same results		
03/24/16	11:20:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350030057D299	12	CIMCON	SSN	0	934	934	1000.565	93.35	-6.65	5% +/- 1Wh			
03/24/16	11:20:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350030055EA21	11	CIMCON	SSN	27797	27797	0	1000.565	0.00	-100.00	5% +/- 1Wh	Meter appears to be faulted. Relay is off, brightness is reading 0, current is reading 0		
03/24/16	11:20:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350030057C67E	13	CIMCON	SSN	27966	28897	931	1000.565	93.05	-6.95	5% +/- 1Wh			
03/24/16	11:20:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350030055EB8B	14	CIMCON	SSN	27756	28689	933	1000.565	93.25	-6.75	5% +/- 1Wh			
03/24/16	14:35:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350030057D299	12	CIMCON	SSN	2826	3779	953	1024.225	93.05	-6.95	5% +/- 1Wh			
03/24/16	14:35:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350030055EA21	11	CIMCON	SSN	27797	27797	0	1024.225	0.00	-100.00	5% +/- 1Wh	Meter appears to be faulted. Relay is off, brightness is reading 0, current is reading 0		
03/24/16	14:35:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350030057C67E	13	CIMCON	SSN	30787	31736	949	1024.225	92.66	-7.34	5% +/- 1Wh			
03/24/16	14:35:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350030055EB8B	14	CIMCON	SSN	30583	31536	953	1024.225	93.05	-6.95	5% +/- 1Wh			
03/24/16	16:00:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350030057D299	12	CIMCON	SSN	3779	4780	1001	1002.470	99.85	-0.15	5% +/- 1Wh			
03/24/16	16:00:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350030055EA21	11	CIMCON	SSN	27797	27797	0	1002.470	0.00	-100.00	5% +/- 1Wh	Meter appears to be faulted. Relay is off, brightness is reading 0, current is reading 0		
03/24/16	16:00:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350030057C67E	13	CIMCON	SSN	31736	32736	1000	1002.470	99.75	-0.25	5% +/- 1Wh			
03/24/16	16:00:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350030055EB8B	14	CIMCON	SSN	31536	32536	1000	1002.470	99.75	-0.25	5% +/- 1Wh			
03/25/16	21:25:00	4.5.1	No Load	120	60	0	1.00	001350030055EAF6	11	CIMCON	SSN	27875	27875	0		100.00	0.00	5% +/- 1Wh			
03/25/16	21:25:00	4.5.1	No Load	120	60	0	1.00	0013500300578FC2	12	CIMCON	SSN	27833	27833	0		100.00	0.00	5% +/- 1Wh			
03/25/16	21:35:00	4.5.2	Starting Load	85	60	0.01	1.00	001350030055EAF6	11	CIMCON	SSN	27875	27875	0		100.00	0.00	5% +/- 1Wh	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node		
03/25/16	21:35:00	4.5.2	Starting Load	85	60	0.01	1.00	0013500300578FC2	12	CIMCON	SSN	27833	27833	0		100.00	0.00	5% +/- 1Wh	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node		
03/25/16	21:40:00	4.5.3	Load Performance (FL)	120	60	10	1.00	001350030055EAF6	11	CIMCON	SSN	27875	28807	932	1001.363	93.07	-6.93	5% +/- 1Wh			
03/25/16	21:40:00	4.5.3	Load Performance (FL)	120	60	10	1.00	0013500300578FC2	12	CIMCON	SSN	27833	28769	936	1001.363	93.47	-6.53	5% +/- 1Wh			
03/25/16	22:25:00	4.5.3	Load Performance (PF)	120	60	10	0.50	001350030055EAF6	11	CIMCON	SSN	28807	29753	946	1021.852	92.58	-7.42	5% +/- 1Wh			
03/25/16	22:25:00	4.5.3	Load Performance (PF)	120	60	10	0.50	0013500300578FC2	12	CIMCON	SSN	28769	29723	954	1021.852	93.36	-6.64	5% +/- 1Wh			
03/26/16	0:10:00	4.5.3	Load Performance (LL)	120	60	1	1.00	001350030055EAF6	11	CIMCON	SSN	29753	30754	1001	1002.804	99.82	-0.18	5% +/- 1Wh			
03/26/16	0:10:00	4.5.3	Load Performance (LL)	120	60	1	1.00	0013500300578FC2	12	CIMCON	SSN	29723	30724	1001	1002.804	99.82	-0.18	5% +/- 1Wh			
04/04/16	15:30:00	4.5.1	No Load	120	60	0	1.00		3899	11	Cimcon	Cimcon	0	0	0		100.00	0.00	2.0% +/- 1Wh		
04/04/16	15:30:00	4.5.1	No Load	120	60	0	1.00		3948	12	Cimcon	Cimcon	0	0	0		100.00	0.00	2.0% +/- 1Wh		
04/04/16	15:30:00	4.5.1	No Load	120	60	0	1.00		3859	13	Cimcon	Cimcon	0	0	0		100.00	0.00	2.0% +/- 1Wh		
04/04/16	15:30:00	4.5.1	No Load	120	60	0	1.00		3943	14	Cimcon	Cimcon	0	0	0		100.00	0.00	2.0% +/- 1Wh		
04/04/16	15:40:00	4.5.2	Starting Load	105	60	0.01	1.00		3899	11	Cimcon	Cimcon	0	0	0		100.00	0.00	2.0% +/- 1Wh	A set to 10mA, node read 0mA. W read 0W	
04/04/16	15:40:00	4.5.2	Starting Load	105	60	0.01	1.00		3948	12	Cimcon	Cimcon	0	0	0		100.00	0.00	2.0% +/- 1Wh	A set to 10mA, node read	

Date	Time	Test#	Description	Volts	Frequency	Amps	Power Factor	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	Observations	Notes
04/07/16	9:15:00	4.5.3	Load Performance (LL)	120	60	1	1.00	3899	11	Cimcon	Cimcon	2.11	3.10	990	1002.871	98.72	-1.28	2.0% +/- 1Wh	Energy readings are in kWh for these units	Could be handheld problem
04/07/16	9:15:00	4.5.3	Load Performance (LL)	120	60	1	1.00	3948	12	Cimcon	Cimcon	2.10	3.09	990	1002.871	98.72	-1.28	2.0% +/- 1Wh	Energy readings are in kWh for these units	Could be handheld problem
04/07/16	9:15:00	4.5.3	Load Performance (LL)	120	60	1	1.00	3859	13	Cimcon	Cimcon	1.80	2.80	1000	1002.871	99.71	-0.29	2.0% +/- 1Wh	Energy readings are in kWh for these units	Could be handheld problem
04/07/16	9:15:00	4.5.3	Load Performance (LL)	120	60	1	1.00	3943	14	Cimcon	Cimcon	2.09	3.08	990	1002.871	98.72	-1.28	2.0% +/- 1Wh	Energy readings are in kWh for these units	Could be handheld problem
04/08/16	10:50:00	4.5.1	No Load	120	60	0	1.00	3953	11	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh		
04/08/16	10:50:00	4.5.1	No Load	120	60	0	1.00	3841	12	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh		
04/08/16	10:50:00	4.5.1	No Load	120	60	0	1.00	3945	13	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh		
04/08/16	10:50:00	4.5.1	No Load	120	60	0	1.00	3944	14	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh		
04/08/16	11:00:00	4.5.2	Starting Load	105	60	0.01	1.00	3953	11	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh	A set to 10mA, node read 0mA. W read 0W	
04/08/16	11:00:00	4.5.2	Starting Load	105	60	0.01	1.00	3841	12	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh	A set to 10mA, node read 0mA. W read 0W	
04/08/16	11:00:00	4.5.2	Starting Load	105	60	0.01	1.00	3945	13	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh	A set to 10mA, node read 0mA. W read 0W	
04/08/16	11:00:00	4.5.2	Starting Load	105	60	0.01	1.00	3944	14	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh	A set to 10mA, node read 0mA. W read 0W	
04/08/16	11:25:00	4.5.3	Load Performance (FL)	120	60	10	1.00	3953	11	Cimcon	Cimcon	0.00	0.01	10	1001.674	1.00	-99.00	2.0% +/- 1Wh	Test failed. Mistakenly set current to 1A rather than 10A.	
04/08/16	11:25:00	4.5.3	Load Performance (FL)	120	60	10	1.00	3841	12	Cimcon	Cimcon	0.00	0.05	50	1001.674	4.99	-95.01	2.0% +/- 1Wh	Test failed. Mistakenly set current to 1A rather than 10A.	
04/08/16	11:25:00	4.5.3	Load Performance (FL)	120	60	10	1.00	3945	13	Cimcon	Cimcon	0.00	0.06	60	1001.674	5.99	-94.01	2.0% +/- 1Wh	Test failed. Mistakenly set current to 1A rather than 10A.	
04/08/16	11:25:00	4.5.3	Load Performance (FL)	120	60	10	1.00	3944	14	Cimcon	Cimcon	0.00	0.92	920	1001.674	91.85	-8.15	2.0% +/- 1Wh	Test failed. Mistakenly set current to 1A rather than 10A.	
04/08/16	13:00:00	4.5.3	Load Performance (FL)	120	60	10	1.00	3953	11	Cimcon	Cimcon	0.01	0.94	930	1001.577	92.85	-7.15	2.0% +/- 1Wh		
04/08/16	13:00:00	4.5.3	Load Performance (FL)	120	60	10	1.00	3841	12	Cimcon	Cimcon	0.05	0.98	930	1001.577	92.85	-7.15	2.0% +/- 1Wh		
04/08/16	13:00:00	4.5.3	Load Performance (FL)	120	60	10	1.00	3945	13	Cimcon	Cimcon	0.06	0.99	930	1001.577	92.85	-7.15	2.0% +/- 1Wh		
04/08/16	13:00:00	4.5.3	Load Performance (FL)	120	60	10	1.00	3944	14	Cimcon	Cimcon	0.92	1.84	920	1001.577	91.86	-8.14	2.0% +/- 1Wh		
04/08/16	15:20:00	4.5.3	Load Performance (PF)	120	60	10	0.50	3953	11	Cimcon	Cimcon	0.94	1.89	950	1026.805	92.52	-7.48	2.0% +/- 1Wh		
04/08/16	15:20:00	4.5.3	Load Performance (PF)	120	60	10	0.50	3841	12	Cimcon	Cimcon	0.98	1.93	950	1026.805	92.52	-7.48	2.0% +/- 1Wh		
04/08/16	15:20:00	4.5.3	Load Performance (PF)	120	60	10	0.50	3945	13	Cimcon	Cimcon	0.99	1.94	950	1026.805	92.52	-7.48	2.0% +/- 1Wh		
04/08/16	15:20:00	4.5.3	Load Performance (PF)	120	60	10	0.50	3944	14	Cimcon	Cimcon	1.84	2.79	950	1026.805	92.52	-7.48	2.0% +/- 1Wh		
04/08/16	17:35:00	4.5.3	Load Performance (LL)	120	60	1	1.00	3953	11	Cimcon	Cimcon	1.89	2.90	1010	1002.877	100.71	0.71	2.0% +/- 1Wh		
04/08/16	17:35:00	4.5.3	Load Performance (LL)	120	60	1	1.00	3841	12	Cimcon	Cimcon	1.93	2.92	990	1002.877	98.72	-1.28	2.0% +/- 1Wh		
04/08/16	17:35:00	4.5.3	Load Performance (LL)	120	60	1	1.00	3945	13	Cimcon	Cimcon	1.94	2.94	1000	1002.877	99.71	-0.29	2.0% +/- 1Wh		
04/08/16	17:35:00	4.5.3	Load Performance (LL)	120	60	1	1.00	3944	14	Cimcon	Cimcon	2.79	3.77	980	1002.877	97.72	-2.28	2.0% +/- 1Wh		
04/11/16	10:50:00	4.5.1	No Load	120	60	0	1.00	3866	11	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh		
04/11/16	10:50:00	4.5.1	No Load	120	60	0	1.00	4159	12	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh		
04/11/16	11:00:00	4.5.2	Starting Load	105	60	0.01	1.00	3866	11	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh	A set to 10mA, node read 0mA. W read 0W	
04/11/16	11:00:00	4.5.2	Starting Load	105	60	0.01	1.00	4159	12	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh	A set to 10mA, node read 0mA. W read 0W	
04/11/16	13:00:00	4.5.3	Load Performance (FL)	120	60	10	1.00	3866	11	Cimcon	Cimcon	0.00	0.93	930	1001.635	92.85	-7.15	2.0% +/- 1Wh		
04/11/16	13:00:00	4.5.3	Load Performance (FL)	120	60	10	1.00	4159	12	Cimcon	Cimcon	0.00	0.93	930	1001.635	92.85	-7.15	2.0% +/- 1Wh		
04/11/16	13:50:00	4.5.3	Load Performance (PF)	120	60	10	0.50	3866	11	Cimcon	Cimcon	0.93	1.88	950	1020.780	93.07	-6.93	2.0% +/- 1Wh		
04/11/16	13:50:00	4.5.3	Load Performance (PF)	120	60	10	0.50	4159	12	Cimcon	Cimcon	0.93	1.88	950	1020.780	93.07	-6.93	2.0% +/- 1Wh		
04/11/16	15:10:00	4.5.3	Load Performance (LL)	120	60	1	1.00	3866	11	Cimcon	Cimcon	1.88	2.89	1010	1003.189	100.68	0.68	2.0% +/- 1Wh		
04/11/16	15:10:00	4.5.3	Load Performance (LL)	120	60	1	1.00	4159	12	Cimcon	Cimcon	1.88	2.89	1010	1003.189	100.68	0.68	2.0% +/- 1Wh		

Date	Time	Test#	Description	Volts	Frequency	Amps	Power Factor	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	Observations	Notes
04/12/16	16:30:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	001350030057BEC8	12	Cimcon	SSN	30762	31417	655	900.696	72.72	-27.28	5% +/- 1Wh		
04/12/16	16:30:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	001350030055EB8B	14	Cimcon	SSN	32539	33409	870	900.696	96.59	-3.41	5% +/- 1Wh		
04/12/16	16:30:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	001350030055EAED	13	Cimcon	SSN	30443	31101	658	900.696	73.05	-26.95	5% +/- 1Wh		
04/12/16	16:30:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	001350030055EA21	11	Cimcon	SSN	4772	5429	657	900.696	72.94	-27.06	5% +/- 1Wh		
04/12/16	16:30:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	001350030057BEC8	12	Cimcon	SSN	31417	32317	900	901.813	99.80	-0.20	5% +/- 1Wh		
04/12/16	16:30:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	001350030055EB8B	14	Cimcon	SSN	33409	34308	899	901.813	99.69	-0.31	5% +/- 1Wh		
04/12/16	16:30:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	001350030055EAED	13	Cimcon	SSN	31101	32002	901	901.813	99.91	-0.09	5% +/- 1Wh		
04/12/16	16:30:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	001350030055EA21	11	Cimcon	SSN	5429	6329	900	901.813	99.80	-0.20	5% +/- 1Wh		
04/13/16	9:25:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	001350030057BEC8	12	Cimcon	SSN	32317	33349	1032	1101.782	93.67	-6.33	5% +/- 1Wh		
04/13/16	9:25:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	001350030055EB8B	14	Cimcon	SSN	34308	35335	1027	1101.782	93.21	-6.79	5% +/- 1Wh		
04/13/16	9:25:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	001350030055EAED	13	Cimcon	SSN	32002	33033	1031	1101.782	93.58	-6.42	5% +/- 1Wh		
04/13/16	9:25:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	001350030055EA21	11	Cimcon	SSN	6329	7359	1030	1101.782	93.48	-6.52	5% +/- 1Wh		
04/13/16	11:25:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	001350030057BEC8	12	Cimcon	SSN	33349	34451	1102	1102.948	99.91	-0.09	5% +/- 1Wh		
04/13/16	11:25:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	001350030055EB8B	14	Cimcon	SSN	35335	36435	1100	1102.948	99.73	-0.27	5% +/- 1Wh		
04/13/16	11:25:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	001350030055EAED	13	Cimcon	SSN	33033	34134	1101	1102.948	99.82	-0.18	5% +/- 1Wh		
04/13/16	11:25:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	001350030055EA21	11	Cimcon	SSN	7359	8460	1101	1102.948	99.82	-0.18	5% +/- 1Wh		
04/14/16	10:10:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	001350030055EAED	13	Cimcon	SSN	34134	35070	936	1001.126	93.49	-6.51	5% +/- 1Wh		
04/14/16	10:10:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	001350030057BEC8	12	Cimcon	SSN	34451	35384	933	1001.126	93.20	-6.80	5% +/- 1Wh		
04/14/16	10:10:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	001350030055EA21	11	Cimcon	SSN	8460	9392	932	1001.126	93.10	-6.90	5% +/- 1Wh		
04/14/16	10:10:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	001350030055EB8B	14	Cimcon	SSN	36435	37365	930	1001.126	92.90	-7.10	5% +/- 1Wh		
04/14/16	11:10:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	001350030055EAED	13	Cimcon	SSN	35070	36006	936	1000.594	93.54	-6.46	5% +/- 1Wh		
04/14/16	11:10:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	001350030057BEC8	12	Cimcon	SSN	35384	36322	938	1000.594	93.74	-6.26	5% +/- 1Wh		
04/14/16	11:10:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	001350030055EA21	11	Cimcon	SSN	9392	10327	935	1000.594	93.44	-6.56	5% +/- 1Wh		
04/14/16	11:10:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	001350030055EB8B	14	Cimcon	SSN	37365	38298	933	1000.594	93.24	-6.76	5% +/- 1Wh		
04/14/16	13:00:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	001350030055EAED	13	Cimcon	SSN	36006	37008	1002	1002.834	99.92	-0.08	5% +/- 1Wh		
04/14/16	13:00:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	001350030057BEC8	12	Cimcon	SSN	36322	37323	1001	1002.834	99.82	-0.18	5% +/- 1Wh		
04/14/16	13:00:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	001350030055EA21	11	Cimcon	SSN	10327	11328	1001	1002.834	99.82	-0.18	5% +/- 1Wh		
04/14/16	13:00:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	001350030055EB8B	14	Cimcon	SSN	38298	39298	1000	1002.834	99.72	-0.28	5% +/- 1Wh		
04/15/16	8:25:00	4.6.2.6	Effect of variation of frequency (LL)	120	61.2	1	1.00	001350030055EAED	13	Cimcon	SSN	37008	38003	995	1002.223	99.28	-0.72	5% +/- 1Wh		
04/15/16	8:25:00	4.6.2.6	Effect of variation of frequency (LL)	120	61.2	1	1.00	001350030057BEC8	12	Cimcon	SSN	37323	38321	998	1002.223	99.58	-0.42	5% +/- 1Wh		
04/15/16	8:25:00	4.6.2.6	Effect of variation of frequency (LL)	120	61.2	1	1.00	001350030055EA21	11	Cimcon	SSN	11328	12321	993	1002.223	99.08	-0.92	5% +/- 1Wh		
04/15/16	8:25:00	4.6.2.6	Effect of variation of frequency (LL)	120	61.2	1	1.00	001350030055EB8B	14	Cimcon	SSN	39298	40294	996	1002.223	99.38	-0.62	5% +/- 1Wh		
04/28/16	12:00:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	3944	12	Cimcon	Cimcon	3.77	NA	NA	NA	NA	NA	2.0% +/- 1Wh	Node appears to have a problem. When applying 10A of load, the relay seems to be opening.	
04/28/16	12:00:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	4159	11	Cimcon	Cimcon	2.70	3.54	840	901.750	93.15	-6.85	2.0% +/- 1Wh		
04/28/16	12:00:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	10	1.00	3841	12	Cimcon	Cimcon	2.70	3.53	830	901.750	92.04	-7.96	2.0% +/- 1Wh		
04/28/16	12:00:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	3866	13	Cimcon	Cimcon	2.70	3.54	840	901.750	93.15	-6.85	2.0% +/- 1Wh		
04/28/16	12:00:00	4.6.1.2	Effect of variation of voltage (FL)	108	60	10	1.00	3945	14	Cimcon	Cimcon	2.70	3.54	840	901.750	93.15	-6.85	2.0% +/- 1Wh		
05/03/16	18:10:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	4159	11	Cimcon	Cimcon	9.48	10.20	720	895.127	80.44	-19.56	2.0% +/- 1Wh		
05/03/16	18:10:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	3841	12	Cimcon	Cimcon	9.42	10.19	770	895.127	86.02	-13.98	2.0% +/- 1Wh		
05/03/16	18:10:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	3866	13	Cimcon	Cimcon	9.48	NA	NA	895.127	NA	NA	2.0% +/- 1Wh	Equipment problem kept me from finishing this test.	
05/03/16	18:10:00	4.6.1.5	Effect of variation of voltage (LL)	108	60	1	1.00	3945	14	Cimcon	Cimcon	9.46	9.90	440	895.127	49.16	-50.84	2.0% +/- 1Wh		
04/29/16	9:30:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	4159	11	Cimcon	Cimcon	3.54	4.57	1030	1102.607	93.41	-6.59	2.0% +/- 1Wh		
04/29/16	9:30:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	3841	12	Cimcon	Cimcon	3.53	4.55	1020	1102.607	92.51	-7.49	2.0% +/- 1Wh		
04/29/16	9:30:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	3866	13	Cimcon	Cimcon	3.54	4.57	1030	1102.607	93.41	-6.59	2.0% +/- 1Wh		
04/29/16	9:30:00	4.6.1.3	Effect of variation of voltage (FL)	132	60	10	1.00	3945	14	Cimcon	Cimcon	3.54	4.56	1020	1102.607	92.51	-7.49	2.0% +/- 1Wh		
05/03/16	9:35:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	4159	11	Cimcon	Cimcon	8.38	9.48	1100	1103.352	99.70	-0.30	2.0% +/- 1Wh		
05/03/16	9:35:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	3841	12	Cimcon	Cimcon	8.33	9.42	1090	1103.352	98.79	-1.21	2.0% +/- 1Wh		
05/03/16	9:35:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	3866	13	Cimcon	Cimcon	8.38	9.48	1100	1103.352	99.70	-0.30	2.0% +/- 1Wh		
05/03/16	9:35:00	4.6.1.6	Effect of variation of voltage (LL)	132	60	1	1.00	3945	14	Cimcon	Cimcon	8.36	9.46	1100	1103.352	99.70	-0.30	2.0% +/- 1Wh		
04/29/16	13:50:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	4159	11	Cimcon	Cimcon	4.57	5.44	870	1002.61	86.77	-13.23	2.0% +/- 1Wh		
04/29/16	13:50:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	3841	12	Cimcon	Cimcon	4.55	5.43	880	1002.61	87.77	-12.23	2.0% +/- 1Wh		
04/29/16	13:50:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	3866	13	Cimcon	Cimcon	4.57	5.44	870	1002.61	86.77	-13.23	2.0% +/- 1Wh		
04/29/16	13:50:00	4.6.2.2	Effect of variation of frequency (FL)	120	58.8	10	1.00	3945	14	Cimcon	Cimcon	4.56	5.44	880	1002.61	87.77	-12.23	2.0% +/- 1Wh		
04/29/16	15:35:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	4159	11	Cimcon	Cimcon	5.44	6.37	930	1001.843	92.83	-7.17	2.0% +/- 1Wh		
04/29/16	15:35:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	3841	12	Cimcon	Cimcon	5.43	6.35	920	1001.843	91.83	-8.17	2.0% +/- 1Wh		
04/29/16	15:35:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	3866	13	Cimcon	Cimcon	5.44	6.37	930	1001.843	92.83	-7.17	2.0% +/- 1Wh		
04/29/16	15:35:00	4.6.2.3	Effect of variation of frequency (FL)	120	61.2	10	1.00	3945	14	Cimcon	Cimcon	5.44	6.37	930	1001.843	92.83	-7.17	2.0% +/- 1Wh		
05/02/16	17:20:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	4159	11	Cimcon	Cimcon	7.38	8.38	1000	1004.887	99.51	-0.49	2.0% +/- 1Wh		
05/02/16	17:20:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	3841	12	Cimcon	Cimcon	7.34	8.33	990	1004.887	98.52	-1.48	2.0% +/- 1Wh		
05/02/16	17:20:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	3866	13	Cimcon	Cimcon	7.37	8.38	1010	1004.887	100.51	0.51	2.0% +/- 1Wh		
05/02/16	17:20:00	4.6.2.5	Effect of variation of frequency (LL)	120	58.8	1	1.00	3945	14	Cimcon	Cimcon	7.36	8.36	1000</						

Date	Time	Test#	Description	Volts	Frequency	Amps	Power Factor	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	Observations	Notes
05/06/16	9:30:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	4159	11	Cimcon	Cimcon	10.20	10.98	780	1155.099	67.53	-32.47 2.0% +/- 10Wh			
05/06/16	9:30:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	3841	12	Cimcon	Cimcon	10.19	10.97	780	1155.099	67.53	-32.47 2.0% +/- 10Wh			
05/06/16	9:30:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	3866	13	Cimcon	Cimcon	9.48	10.38	900	1155.099	77.92	-22.08 2.0% +/- 10Wh			
05/06/16	9:30:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	3945	14	Cimcon	Cimcon	9.90	10.98	1080	1155.099	93.50	-6.50 2.0% +/- 10Wh			
05/06/16	10:45:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	4159	11	Cimcon	Cimcon	10.98	11.93	950	1205.637	78.80	-21.20 2.0% +/- 10Wh			
05/06/16	10:45:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	3841	12	Cimcon	Cimcon	10.97	11.92	950	1205.637	78.80	-21.20 2.0% +/- 10Wh			
05/06/16	10:45:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	3866	13	Cimcon	Cimcon	10.38	11.33	950	1205.637	78.80	-21.20 2.0% +/- 10Wh			
05/06/16	10:45:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	3945	14	Cimcon	Cimcon	10.98	11.93	950	1205.637	78.80	-21.20 2.0% +/- 10Wh			
05/12/16	15:00:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	4159	11	Cimcon	Cimcon	11.70	12.50	800	851.042	94.00	-6.00 2.0% +/- 10Wh			
05/12/16	15:00:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	3841	12	Cimcon	Cimcon	11.70	12.49	790	851.042	92.83	-7.17 2.0% +/- 10Wh			
05/12/16	15:00:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	3866	13	Cimcon	Cimcon	11.10	11.90	800	851.042	94.00	-6.00 2.0% +/- 10Wh			
05/12/16	15:00:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	3945	14	Cimcon	Cimcon	11.70	12.50	800	851.042	94.00	-6.00 2.0% +/- 10Wh			
05/12/16	16:15:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	4159	11	Cimcon	Cimcon	12.31	13.05	740	800.889	92.40	-7.60 2.0% +/- 10Wh	Wh for this node went from 12.50 at the end of the last test to 12.31 at the beginning of this one.	This may have been happening for some time. Must recheck data	
05/12/16	16:15:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	3841	12	Cimcon	Cimcon	12.30	13.04	740	800.889	92.40	-7.60 2.0% +/- 10Wh	Wh for this node went from 12.50 at the end of the last test to 12.31 at the beginning of this one.	This may have been happening for some time. Must recheck data	
05/12/16	16:15:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	3866	13	Cimcon	Cimcon	11.70	12.45	750	800.889	93.65	-6.35 2.0% +/- 10Wh	Wh for this node went from 12.50 at the end of the last test to 12.31 at the beginning of this one.	This may have been happening for some time. Must recheck data	
05/12/16	16:15:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	3945	14	Cimcon	Cimcon	12.31	13.05	740	800.889	92.40	-7.60 2.0% +/- 10Wh	Wh for this node went from 12.50 at the end of the last test to 12.31 at the beginning of this one.	This may have been happening for some time. Must recheck data	
05/06/16	15:00:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	001350030055EAF6	14	Cimcon	SSN	30771	31846	1075	1153.953	93.16	-6.84 5% +/- 1Wh			
05/06/16	15:00:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	001350030057D29A	12	Cimcon	SSN	30069	31145	1076	1153.953	93.24	-6.76 5% +/- 1Wh			
05/06/16	15:00:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	001350030057C67E	13	Cimcon	SSN	27797	27797	0	1153.953	0.00	-100.00 5% +/- 1Wh	Apparent failure of node on this test. No Wh registered. Relay open. Will not close		
05/06/16	15:00:00	4.6.3	Additional Test (+15%) Volts (FL)	138	60	10	1.00	001350030055EA20	11	Cimcon	SSN	30597	31676	1079	1153.953	93.50	-6.50 5% +/- 1Wh			
05/06/16	16:00:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	001350030055EAF6	14	Cimcon	SSN	31846	32968	1122	1203.403	93.24	-6.76 5% +/- 1Wh			
05/06/16	16:00:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	001350030057D29A	12	Cimcon	SSN	31145	32268	1123	1203.403	93.32	-6.68 5% +/- 1Wh			
05/06/16	16:00:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	001350030057C67E	13	Cimcon	SSN	27797	27797	0	1203.403	0.00	-100.00 5% +/- 1Wh	Apparent failure of node on this test. No Wh registered. Relay open. Will not close		
05/06/16	16:00:00	4.6.3	Additional Test (+20%) Volts (FL)	144	60	10	1.00	001350030055EA20	11	Cimcon	SSN	31676	32801	1125	1203.403	93.48	-6.52 5% +/- 1Wh			
05/17/16	16:45:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	001350030057D29A	12	Cimcon	SSN	32289	33081	792	850.535	93.12	-6.88 5% +/- 1Wh			
05/17/16	16:45:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	001350030055EA20	11	Cimcon	SSN	32821	33615	794	850.535	93.35	-6.65 5% +/- 1Wh			
05/17/16	16:45:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	001350030057C67E	14	Cimcon	SSN	27797	27797	0	850.535	0.00	-100.00 5% +/- 1Wh	Apparent failure of node on this test. No Wh registered. Relay open. Will not close		
05/17/16	16:45:00	4.6.3	Additional Test (-15%) Volts (FL)	102	60	10	1.00	001350030055EAF6	13	Cimcon	SSN	32988	33779	791	850.535	93.00	-7.00 5% +/- 1Wh			
05/17/16	17:45:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	001350030057D29A	12	Cimcon	SSN	33093	33839	746	800.299	93.22	-6.78 5% +/- 1Wh			
05/17/16	17:45:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	001350030055EA20	11	Cimcon	SSN	33627	34374	747	800.299	93.34	-6.66 5% +/- 1Wh			
05/17/16	17:45:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	001350030057C67E	14	Cimcon	SSN	27797	27797	0	800.299	0.00	-100.00 5% +/- 1Wh	Apparent failure of node on this test. No Wh registered. Relay open. Will not close		
05/17/16	17:45:00	4.6.3	Additional Test (-20%) Volts (FL)	96	60	10	1.00	001350030055EAF6	13	Cimcon	SSN	33791	34535	744	800.299	92.97	-7.03 5% +/- 1Wh			
06/01/16	14:45:00	4.6.4	Additional Test (15A)	120	60	15	1.00	4159	11	Cimcon	Cimcon	12.91	13.59	680	980.846	69.33	-30.67 2.0% +/- 10Wh	13.51 after power cycle		
06/01/16	14:45:00	4.6.4	Additional Test (15A)	120	60	15	1.00	3841	12	Cimcon	Cimcon	12.90	13.58	680	980.846	69.33	-30.67 2.0% +/- 10Wh	13.50 after power cycle		
06/01/16	14:45:00	4.6.4	Additional Test (15A)	120	60	15	1.00	3866	13	Cimcon	Cimcon	12.30	12.98	680	980.846	69.33	-30.67 2.0% +/- 10Wh	12.90 after power cycle		
06/01/16	14:45:00	4.6.4	Additional Test (15A)	120	60	15	1.00	3945	14	Cimcon	Cimcon	12.91	13.58	670	980.846	68.31	-31.69 2.0% +/- 10Wh	13.51 after power cycle		
06/01/16	16:00:00	4.6.4	Additional Test (0.5A)	120	60	0.5	1.00	4159	11	Cimcon	Cimcon	13.51	14.51	1000	1002.833	99.72	-0.28 2.0% +/- 10Wh	14.41 after power cycle		
06/01/16	16:00:00	4.6.4	Additional Test (0.5A)	120	60	0.5	1.00	3841	12	Cimcon	Cimcon	13.50	14.49	990	1002.833	98.72	-1.28 2.0% +/- 10Wh	14.40 after power cycle		
06/01/16	16:00:00	4.6.4	Additional Test (0.5A)	120	60	0.5	1.00	3866	13	Cimcon	Cimcon	12.90	13.91	1010	1002.833	100.71	0.71 2.0% +/- 10Wh	13.80 after power cycle		
06/01/16	16:00:00	4.6.4	Additional Test (0.5A)	120	60	0.5	1.00	3945	14	Cimcon	Cimcon	13.51	14.50	990	1002.833	98.72	-1.28 2.0% +/- 10Wh	14.41 after power cycle		

Date	Time	Test#	Description	Volts	Frequency	Metered Load (Amps)	Parasitic Load (mA)	Parasitic Load (VA)	Node ID	Socket #	Manufacturer	Method	Observations	Notes
06/13/16	11:20:00	N/A	Parasitic Load	120.257	60	0	6.94	0.835	3948	11	Cimcon	Cimcon		
06/13/16	11:22:00	N/A	Parasitic Load	120.257	60	0	6.94	0.835	4159	11	Cimcon	Cimcon		
06/13/16	11:24:00	N/A	Parasitic Load	120.257	60	0	6.95	0.836	3945	11	Cimcon	Cimcon		
06/13/16	11:26:00	N/A	Parasitic Load	120.257	60	0	7.10	0.854	3841	11	Cimcon	Cimcon		
06/13/16	11:28:00	N/A	Parasitic Load	120.257	60	0	6.96	0.837	3944	11	Cimcon	Cimcon		
06/13/16	11:30:00	N/A	Parasitic Load	120.257	60	0	7.70	0.926	001350030055EA21	11	Cimcon	SSN	Parasitic Load varied from 7.6 to 7.8mA	
06/13/16	11:32:00	N/A	Parasitic Load	120.257	60	0	7.70	0.926	001350030055EA20	11	Cimcon	SSN	Parasitic Load varied from 7.6 to 7.8mA	
06/13/16	11:34:00	N/A	Parasitic Load	120.257	60	0	7.80	0.938	001350030055EB8B	11	Cimcon	SSN	Parasitic Load varied from 7.7 to 7.9mA	
06/13/16	11:36:00	N/A	Parasitic Load	120.257	60	0	7.36	0.885	001350030057C67E	11	Cimcon	SSN		
06/13/16	11:38:00	N/A	Parasitic Load	120.257	60	0	7.60	0.914	001350030057D29A	11	Cimcon	SSN	Parasitic Load varied from 7.5 to 7.7mA	

Date	Testing Notes
18-Mar	Cimcon SSN nodes are all at network ID 1341, rather than 1421 as instructed.
21-Mar	Takes a few minutes for any of these nodes to come online after even a brief (<10sec) power outage
25-Mar	The Cimcon/SSN nodes seem to continue to communicate for a period of time after they have been powered down.
4-Apr	Cimcon Cimcon nodes seem to take longer to boot and respond to the handheld configurator. Had to query each node a number of times.
4-Apr	Cimcon Cimcon nodes only have 10Wh resolution. This should make testing much slower. Decided to test with same time and forego the required resolution. This might make testing these units impractical given the amount of time that it would take to get the right resolution.
6-Apr	Handheld configurator had been set to wrong channel (probably a data entry mistake that I made). This issue was corrected (proper channel =21). However, the fact remains that it takes up to 7 retries of pressing the "Read Data" button to actually get the data and not get a timeout message
20-Apr	Board calibrated. Was due 4/21/16
29-Apr	Note that the granularity in the accuracy readings for the Cimcon/Cimcon nodes can explain some of the errors that we saw. For time sake, the tests were kept short, and since these nodes only report 10s of Wh, the error variance in the calculations could be quite high.
5-May	Noted that on some Cimcon/Cimcon nodes, the end WH reading was greater than the start Wh reading for the next test, indicating that the Wh reading was being reduced, possibly during power cycles.

Test#	Description	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	P/F Criteria (%)	Pass/Fail	Observations	Notes
4.5.1	No Load	3899	11	Cimcon	Cimcon	0	0	0		100.00	0.00	2.0% +/- 1Wh		P		
4.5.1	No Load	3948	12	Cimcon	Cimcon	0	0	0		100.00	0.00	2.0% +/- 1Wh		P		
4.5.1	No Load	3859	13	Cimcon	Cimcon	0	0	0		100.00	0.00	2.0% +/- 1Wh		P		
4.5.1	No Load	3943	14	Cimcon	Cimcon	0	0	0		100.00	0.00	2.0% +/- 1Wh		P		
4.5.1	No Load	3953	11	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh		P		
4.5.1	No Load	3841	12	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh		P		
4.5.1	No Load	3945	13	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh		P		
4.5.1	No Load	3944	14	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh		P		
4.5.1	No Load	3866	11	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh		P		
4.5.1	No Load	4159	12	Cimcon	Cimcon	0.00	0.00	0		100.00	0.00	2.0% +/- 1Wh		P		
4.5.1	No Load	001350030057BEC8	13	CIMCON	SSN	28524	28524	0	0.000	100.00	0.00	5% +/- 1Wh		P		
4.5.1	No Load	001350030055EAED	11	CIMCON	SSN	28204	28204	0	0.000	100.00	0.00	5% +/- 1Wh		P		
4.5.1	No Load	001350030055EA20	12	CIMCON	SSN	28347	28347	0	0.000	100.00	0.00	5% +/- 1Wh		P		
4.5.1	No Load	001350030057D29A	14	CIMCON	SSN	27826	27826	0	0.000	100.00	0.00	5% +/- 1Wh		P		
4.5.1	No Load	001350030057D299	12	CIMCON	SSN	27966	27966	0		100.00	0.00	5% +/- 1Wh		P		
4.5.1	No Load	001350030055EA21	11	CIMCON	SSN	0	0	0		100.00	0.00	5% +/- 1Wh		P		
4.5.1	No Load	001350030057C67E	13	CIMCON	SSN	27797	27797	0		100.00	0.00	5% +/- 1Wh		P		
4.5.1	No Load	001350030055EB8B	14	CIMCON	SSN	27756	27756	0		100.00	0.00	5% +/- 1Wh		P		
4.5.1	No Load	001350030055EAF6	11	CIMCON	SSN	27875	27875	0		100.00	0.00	5% +/- 1Wh		P		
4.5.1	No Load	001350030057BFC2	12	CIMCON	SSN	27833	27833	0		100.00	0.00	5% +/- 1Wh		P		
4.5.3	Load Performance (LL)	3899	11	Cimcon	Cimcon	2.11	3.10	990	1002.871	98.72	-1.28	2.0% +/- 1Wh	2.100	P	Energy readings are in kWh for these units	Could be handheld problem
4.5.3	Load Performance (LL)	3948	12	Cimcon	Cimcon	2.10	3.09	990	1002.871	98.72	-1.28	2.0% +/- 1Wh	2.100	P	Energy readings are in kWh for these units	Could be handheld problem
4.5.3	Load Performance (LL)	3859	13	Cimcon	Cimcon	1.80	2.80	1000	1002.871	99.71	-0.29	2.0% +/- 1Wh	2.100	P	Energy readings are in kWh for these units	Could be handheld problem
4.5.3	Load Performance (LL)	3943	14	Cimcon	Cimcon	2.09	3.08	990	1002.871	98.72	-1.28	2.0% +/- 1Wh	2.100	P	Energy readings are in kWh for these units	Could be handheld problem
4.5.3	Load Performance (LL)	3953	11	Cimcon	Cimcon	1.89	2.90	1010	1002.877	100.71	0.71	2.0% +/- 1Wh	2.100	P		
4.5.3	Load Performance (LL)	3841	12	Cimcon	Cimcon	1.93	2.92	990	1002.877	98.72	-1.28	2.0% +/- 1Wh	2.100	P		
4.5.3	Load Performance (LL)	3945	13	Cimcon	Cimcon	1.94	2.94	1000	1002.877	99.71	-0.29	2.0% +/- 1Wh	2.100	P		
4.5.3	Load Performance (LL)	3866	11	Cimcon	Cimcon	1.88	2.89	1010	1003.189	100.68	0.68	2.0% +/- 1Wh	2.100	P		
4.5.3	Load Performance (LL)	4159	12	Cimcon	Cimcon	1.88	2.89	1010	1003.189	100.68	0.68	2.0% +/- 1Wh	2.100	P		
4.5.3	Load Performance (LL)	001350030057D29A	14	CIMCON	SSN	28840	28940	100	100.062	99.94	-0.06	5% +/- 1Wh	1.499	P		
4.5.3	Load Performance (LL)	001350030055EA20	12	CIMCON	SSN	29363	29463	100	100.062	99.94	-0.06	5% +/- 1Wh	1.499	P		
4.5.3	Load Performance (LL)	001350030055EAED	11	CIMCON	SSN	29222	29322	100	100.062	99.94	-0.06	5% +/- 1Wh	1.499	P		
4.5.3	Load Performance (LL)	001350030057BEC8	13	CIMCON	SSN	29542	29642	100	100.062	99.94	-0.06	5% +/- 1Wh	1.499	P		
4.5.3	Load Performance (LL)	001350030057D299	12	CIMCON	SSN	3779	4780	1001	1002.470	99.85	-0.15	5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	001350030057C67E	13	CIMCON	SSN	31736	32736	1000	1002.470	99.75	-0.25	5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	001350030055EB8B	14	CIMCON	SSN	31536	32536	1000	1002.470	99.75	-0.25	5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	001350030055EAF6	11	CIMCON	SSN	29753	30754	1001	1002.804	99.82	-0.18	5% +/- 1Wh	0.600	P		
4.5.3	Load Performance (LL)	001350030057BFC2	12	CIMCON	SSN	29723	30724	1001	1002.804	99.82	-0.18	5% +/- 1Wh	0.600	P		
4.6.1.5	Effect of variation of voltage (LL)	001350030057BEC8	12	Cimcon	SSN	31417	32317	900	901.813	99.80	-0.20	5% +/- 1Wh	0.611	P		
4.6.1.5	Effect of variation of voltage (LL)	001350030055EB8B	14	Cimcon	SSN	33409	34308	899	901.813	99.69	-0.31	5% +/- 1Wh	0.611	P		
4.6.1.5	Effect of variation of voltage (LL)	001350030055EAED	13	Cimcon	SSN	31101	32002	901	901.813	99.91	-0.09	5% +/- 1Wh	0.611	P		
4.6.1.5	Effect of variation of voltage (LL)	001350030055EA21	11	Cimcon	SSN	5429	6329	900	901.813	99.80	-0.20	5% +/- 1Wh	0.611	P		
4.6.1.6	Effect of variation of voltage (LL)	4159	11	Cimcon	Cimcon	8.38	9.48	1100	1103.352	99.70	-0.30	2.0% +/- 1Wh	2.091	P		
4.6.1.6	Effect of variation of voltage (LL)	3841	12	Cimcon	Cimcon	8.33	9.42	1090	1103.352	98.79	-1.21	2.0% +/- 1Wh	2.091	P		
4.6.1.6	Effect of variation of voltage (LL)	3866	13	Cimcon	Cimcon	8.38	9.48	1100	1103.352	99.70	-0.30	2.0% +/- 1Wh	2.091	P		
4.6.1.6	Effect of variation of voltage (LL)	3945	14	Cimcon	Cimcon	8.36	9.46	1100	1103.352	99.70	-0.30	2.0% +/- 1Wh	2.091	P		
4.6.1.6	Effect of variation of voltage (LL)	001350030057BEC8	12	Cimcon	SSN	33349	34451	1102	1102.948	99.91	-0.09	5% +/- 1Wh	0.591	P		
4.6.1.6	Effect of variation of voltage (LL)	001350030055EB8B	14	Cimcon	SSN	35335	36435	1100	1102.948	99.73	-0.27	5% +/- 1Wh	0.591	P		
4.6.1.6	Effect of variation of voltage (LL)	001350030055EAED	13	Cimcon	SSN	33033	34134	1101	1102.948	99.82	-0.18	5% +/- 1Wh	0.591	P		
4.6.1.6	Effect of variation of voltage (LL)	001350030055EA21	11	Cimcon	SSN	7359	8460	1101	1102.948	99.82	-0.18	5% +/- 1Wh	0.591	P		
4.6.2.5	Effect of variation of frequency (LL)	4159	11	Cimcon	Cimcon	7.38	8.38	1000	1004.887	99.51	-0.49	2.0% +/- 1Wh	2.100	P		
4.6.2.5	Effect of variation of frequency (LL)	3841	12	Cimcon	Cimcon	7.34	8.33	990	1004.887	98.52	-1.48	2.0% +/- 1Wh	2.100	P		
4.6.2.5	Effect of variation of frequency (LL)	3866	13	Cimcon	Cimcon	7.37	8.38	1010	1004.887	100.51	0.51	2.0% +/- 1Wh	2.100	P		
4.6.2.5	Effect of variation of frequency (LL)	3945	14	Cimcon	Cimcon	7.36	8.36	1000	1004.887	99.51	-0.49	2.0% +/- 1Wh	2.100	P		
4.6.2.5	Effect of variation of frequency (LL)	001350030055EAED	13	Cimcon	SSN	36006	37008	1002	1002.834	99.92	-0.08	5% +/- 1Wh	0.600	P		

Test#	Description	Node ID	Socket #	Manufacturer	Method	Start Reading	End Reading	Node Wh	Reference Std Wh	Registration %	Error %	Expected	P/F Criteria (%)	Pass/Fail	Observations	Notes
4.6.2.5	Effect of variation of frequency (LL)	001350030057BEC8	12	Cimcon	SSN	36322	37323	1001	1002.834	99.82	-0.18	5% +/- 1Wh	0.600	P		
4.6.2.5	Effect of variation of frequency (LL)	001350030055EA21	11	Cimcon	SSN	10327	11328	1001	1002.834	99.82	-0.18	5% +/- 1Wh	0.600	P		
4.6.2.5	Effect of variation of frequency (LL)	001350030055EB8B	14	Cimcon	SSN	38298	39298	1000	1002.834	99.72	-0.28	5% +/- 1Wh	0.600	P		
4.6.2.6	Effect of variation of frequency (LL)	4159	11	Cimcon	Cimcon	6.37	7.38	1010	1002.408	100.76	0.76	2.0% +/- 1Wh	2.100	P		
4.6.2.6	Effect of variation of frequency (LL)	3841	12	Cimcon	Cimcon	6.35	7.34	990	1002.408	98.76	-1.24	2.0% +/- 1Wh	2.100	P		
4.6.2.6	Effect of variation of frequency (LL)	3866	13	Cimcon	Cimcon	6.37	7.37	1000	1002.408	99.76	-0.24	2.0% +/- 1Wh	2.100	P		
4.6.2.6	Effect of variation of frequency (LL)	3945	14	Cimcon	Cimcon	6.37	7.36	990	1002.408	98.76	-1.24	2.0% +/- 1Wh	2.100	P		
4.6.2.6	Effect of variation of frequency (LL)	001350030057BEC8	12	Cimcon	SSN	37323	38321	998	1002.223	99.58	-0.42	5% +/- 1Wh	0.600	P		
4.6.4	Additional Test (0.5A)	4159	11	Cimcon	Cimcon	13.51	14.51	1000	1002.833	99.72	-0.28	2.0% +/- 10Wh	2.100	P	14.41 after power cycle	
4.6.4	Additional Test (0.5A)	3841	12	Cimcon	Cimcon	13.50	14.49	990	1002.833	98.72	-1.28	2.0% +/- 10Wh	2.100	P	14.40 after power cycle	
4.6.4	Additional Test (0.5A)	3866	13	Cimcon	Cimcon	12.90	13.91	1010	1002.833	100.71	0.71	2.0% +/- 10Wh	2.100	P	13.80 after power cycle	
4.6.4	Additional Test (0.5A)	3945	14	Cimcon	Cimcon	13.51	14.50	990	1002.833	98.72	-1.28	2.0% +/- 10Wh	2.100	P	14.41 after power cycle	

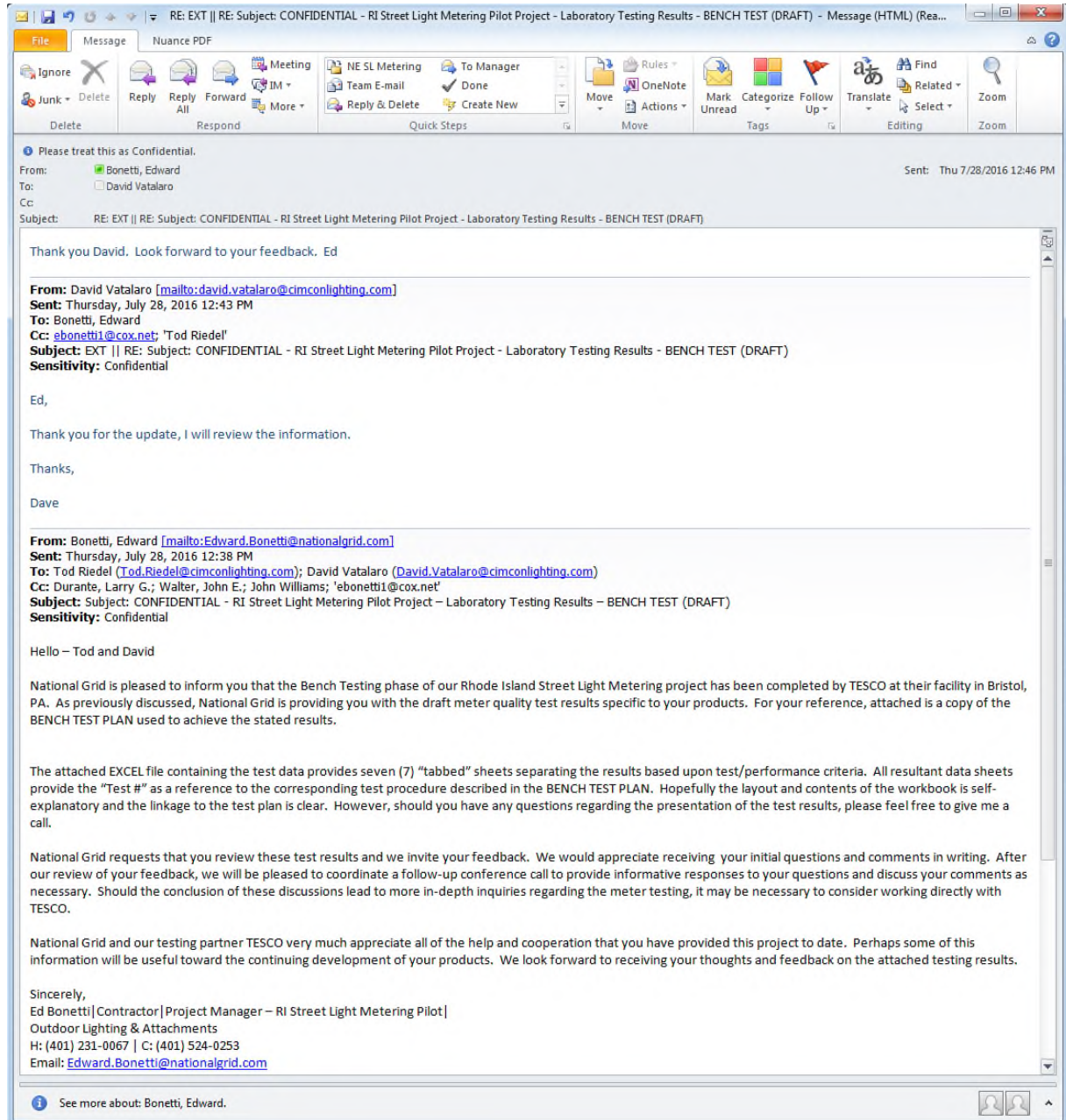
Test#	Description	Node ID	Socket #	Manufacturer	Method	Error %	Expected	P/F Criteria (%)	Pass/Fail	Observations	Notes
4.5.2	Starting Load		3899	11 Cimcon	Cimcon	0.00	2.0% +/- 1Wh		F	A set to 10mA, node read 0mA. W read 0W	
4.5.2	Starting Load		3948	12 Cimcon	Cimcon	0.00	2.0% +/- 1Wh		F	A set to 10mA, node read 0mA. W read 0W	
4.5.2	Starting Load		3859	13 Cimcon	Cimcon	0.00	2.0% +/- 1Wh		F	A set to 10mA, node read 0mA. W read 0W	
4.5.2	Starting Load		3943	14 Cimcon	Cimcon	0.00	2.0% +/- 1Wh		F	A set to 10mA, node read 0mA. W read 0W	
4.5.2	Starting Load		3953	11 Cimcon	Cimcon	0.00	2.0% +/- 1Wh		F	A set to 10mA, node read 0mA. W read 0W	
4.5.2	Starting Load		3841	12 Cimcon	Cimcon	0.00	2.0% +/- 1Wh		F	A set to 10mA, node read 0mA. W read 0W	
4.5.2	Starting Load		3945	13 Cimcon	Cimcon	0.00	2.0% +/- 1Wh		F	A set to 10mA, node read 0mA. W read 0W	
4.5.2	Starting Load		3944	14 Cimcon	Cimcon	0.00	2.0% +/- 1Wh		F	A set to 10mA, node read 0mA. W read 0W	
4.5.2	Starting Load		3866	11 Cimcon	Cimcon	0.00	2.0% +/- 1Wh		F	A set to 10mA, node read 0mA. W read 0W	
4.5.2	Starting Load		4159	12 Cimcon	Cimcon	0.00	2.0% +/- 1Wh		F	A set to 10mA, node read 0mA. W read 0W	
4.5.2	Starting Load	001350030057BEC8	13	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	Spec says min volts =85
4.5.2	Starting Load	001350030055EAED	11	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	Spec says min volts =85
4.5.2	Starting Load	001350030055EA20	12	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	Spec says min volts =85
4.5.2	Starting Load	001350030057D29A	14	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	Spec says min volts =85
4.5.2	Starting Load	001350030057D299	12	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	
4.5.2	Starting Load	001350030055EA21	11	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	Unit faulted out at 85V; relay opened up
4.5.2	Starting Load	001350030057C67E	13	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	
4.5.2	Starting Load	001350030055EB88	14	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	
4.5.2	Starting Load	001350030055EA21	11	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Reran test at 105V, same results	
4.5.2	Starting Load	001350030057C67E	13	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Reran test at 105V, same results	Unit faulted out at 85V; relay opened up
4.5.2	Starting Load	001350030057D299	12	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Reran test at 105V, same results	
4.5.2	Starting Load	001350030055EB88	14	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Reran test at 105V, same results	
4.5.2	Starting Load	001350030055EAF6	11	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	
4.5.2	Starting Load	001350030057BFC2	12	CIMCON	SSN	0.00	.5% +/- 1Wh		F	Current registered as 0mA on node and .01A on ref. std. Watts also registered 0 on the node	
4.5.3	Load Performance (FL)		3899	11 Cimcon	Cimcon	-6.68	2.0% +/- 1Wh	2.099	F	Energy readings are in kWh for these units	
4.5.3	Load Performance (FL)		3948	12 Cimcon	Cimcon	-7.68	2.0% +/- 1Wh	2.099	F	Energy readings are in kWh for these units	
4.5.3	Load Performance (FL)		3859	13 Cimcon	Cimcon	-6.68	2.0% +/- 1Wh	2.099	F	Energy readings are in kWh for these units	
4.5.3	Load Performance (FL)		3943	14 Cimcon	Cimcon	-7.68	2.0% +/- 1Wh	2.099	F	Energy readings are in kWh for these units	
4.5.3	Load Performance (FL)		3953	11 Cimcon	Cimcon	-7.15	2.0% +/- 1Wh	2.100	F		
4.5.3	Load Performance (FL)		3841	12 Cimcon	Cimcon	-7.15	2.0% +/- 1Wh	2.100	F		
4.5.3	Load Performance (FL)		3945	13 Cimcon	Cimcon	-7.15	2.0% +/- 1Wh	2.100	F		
4.5.3	Load Performance (FL)		3944	14 Cimcon	Cimcon	-8.14	2.0% +/- 1Wh	2.100	F		
4.5.3	Load Performance (FL)		3866	11 Cimcon	Cimcon	-7.15	2.0% +/- 1Wh	2.100	F		
4.5.3	Load Performance (FL)		4159	12 Cimcon	Cimcon	-7.15	2.0% +/- 1Wh	2.100	F		
4.5.3	Load Performance (FL)	001350030057D29A	14	CIMCON	SSN	-6.73	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350030055EA20	12	CIMCON	SSN	-6.63	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350030055EAED	11	CIMCON	SSN	-6.43	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350030057BEC8	13	CIMCON	SSN	-6.33	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350030057D299	12	CIMCON	SSN	-6.65	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350030055EA21	11	CIMCON	SSN	-100.00	.5% +/- 1Wh	0.600	F	Meter appears to be faulted. Relay is off, brightness is reading 0, current is reading 0	
4.5.3	Load Performance (FL)	001350030057C67E	13	CIMCON	SSN	-6.95	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350030055EB88	14	CIMCON	SSN	-6.75	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350030055EAF6	11	CIMCON	SSN	-6.93	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)	001350030057BFC2	12	CIMCON	SSN	-6.53	.5% +/- 1Wh	0.600	F		
4.5.3	Load Performance (FL)		3953	11 Cimcon	Cimcon	-99.00	2.0% +/- 1Wh	2.100	NA	Test failed. Mistakenly set current to 1A rather than 10A.	
4.5.3	Load Performance (FL)		3841	12 Cimcon	Cimcon	-95.01	2.0% +/- 1Wh	2.100	NA	Test failed. Mistakenly set current to 1A rather than 10A.	
4.5.3	Load Performance (FL)		3945	13 Cimcon	Cimcon	-94.01	2.0% +/- 1Wh	2.100	NA	Test failed. Mistakenly set current to 1A rather than 10A.	
4.5.3	Load Performance (FL)		3944	14 Cimcon	Cimcon	-8.15	2.0% +/- 1Wh	2.100	NA	Test failed. Mistakenly set current to 1A rather than 10A.	
4.5.3	Load Performance (LL)		3944	14 Cimcon	Cimcon	-2.28	2.0% +/- 1Wh	2.100	F		
4.5.3	Load Performance (LL)	001350030055EA21	11	CIMCON	SSN	-100.00	.5% +/- 1Wh	0.600	F	Meter appears to be faulted. Relay is off, brightness is reading 0, current is reading 0	
4.5.3	Load Performance (PF)		3899	11 Cimcon	Cimcon	-7.18	2.0% +/- 1Wh	2.098	F	Energy readings are in kWh for these units	
4.5.3	Load Performance (PF)		3948	12 Cimcon	Cimcon	-7.18	2.0% +/- 1Wh	2.098	F	Energy readings are in kWh for these units	
4.5.3	Load Performance (PF)		3859	13 Cimcon	Cimcon	-8.16	2.0% +/- 1Wh	2.098	F	Energy readings are in kWh for these units	
4.5.3	Load Performance (PF)		3943	14 Cimcon	Cimcon	-8.16	2.0% +/- 1Wh	2.098	F	Energy readings are in kWh for these units	
4.5.3	Load Performance (PF)		3953	11 Cimcon	Cimcon	-7.48	2.0% +/- 1Wh	2.097	F		
4.5.3	Load Performance (PF)		3841	12 Cimcon	Cimcon	-7.48	2.0% +/- 1Wh	2.097	F		
4.5.3	Load Performance (PF)		3945	13 Cimcon	Cimcon	-7.48	2.0% +/- 1Wh	2.097	F		
4.5.3	Load Performance (PF)		3944	14 Cimcon	Cimcon	-7.48	2.0% +/- 1Wh	2.097	F		
4.5.3	Load Performance (PF)		3866	11 Cimcon	Cimcon	-6.93	2.0% +/- 1Wh	2.098	F		
4.5.3	Load Performance (PF)		4159	12 Cimcon	Cimcon	-6.93	2.0% +/- 1Wh	2.098	F		
4.5.3	Load Performance (PF)	001350030057D29A	14	CIMCON	SSN	-7.21	.5% +/- 1Wh	0.583	F		

Test#	Description	Node ID	Socket #	Manufacturer	Method	Error %	Expected	P/F Criteria (%)	Pass/Fail	Observations	Notes
4.5.3	Load Performance (PF)	001350030055EA20	12	CIMCON	SSN	-7.04	.5% +/- 1Wh	0.583	F		
4.5.3	Load Performance (PF)	001350030055EAED	11	CIMCON	SSN	-6.87	.5% +/- 1Wh	0.583	F		
4.5.3	Load Performance (PF)	001350030057BEC8	13	CIMCON	SSN	-6.63	.5% +/- 1Wh	0.583	F		
4.5.3	Load Performance (PF)	001350030057D299	12	CIMCON	SSN	-6.95	.5% +/- 1Wh	0.598	F		
4.5.3	Load Performance (PF)	001350030055EA21	11	CIMCON	SSN	-100.00	.5% +/- 1Wh	0.598	F	Meter appears to be faulted. Relay is off, brightness is reading 0, current is reading 0	
4.5.3	Load Performance (PF)	001350030057C67E	13	CIMCON	SSN	-7.34	.5% +/- 1Wh	0.598	F		
4.5.3	Load Performance (PF)	001350030055EB88	14	CIMCON	SSN	-6.95	.5% +/- 1Wh	0.598	F		
4.5.3	Load Performance (PF)	001350030055EAF6	11	CIMCON	SSN	-7.42	.5% +/- 1Wh	0.598	F		
4.5.3	Load Performance (PF)	001350030057BFC2	12	CIMCON	SSN	-6.64	.5% +/- 1Wh	0.598	F		
4.6.1.2	Effect of variation of voltage (FL)	3944	12	Cimcon	Cimcon	NA	2.0% +/- 1Wh		F	Node appears to have a problem. When applying 10A of load, the relay seems to be opening.	
4.6.1.2	Effect of variation of voltage (FL)	4159	11	Cimcon	Cimcon	-6.85	2.0% +/- 1Wh	2.111	F		
4.6.1.2	Effect of variation of voltage (FL)	3866	13	Cimcon	Cimcon	-6.85	2.0% +/- 1Wh	2.111	F		
4.6.1.2	Effect of variation of voltage (FL)	3945	14	Cimcon	Cimcon	-6.85	2.0% +/- 1Wh	2.111	F		
4.6.1.2	Effect of variation of voltage (FL)	001350030057BEC8	12	Cimcon	SSN	-27.28	.5% +/- 1Wh	0.611	F		
4.6.1.2	Effect of variation of voltage (FL)	001350030055EB88	14	Cimcon	SSN	-3.41	.5% +/- 1Wh	0.611	F		
4.6.1.2	Effect of variation of voltage (FL)	001350030055EAED	13	Cimcon	SSN	-26.95	.5% +/- 1Wh	0.611	F		
4.6.1.2	Effect of variation of voltage (FL)	001350030055EA21	11	Cimcon	SSN	-27.06	.5% +/- 1Wh	0.611	F		
4.6.1.3	Effect of variation of voltage (FL)	4159	11	Cimcon	Cimcon	-6.59	2.0% +/- 1Wh	2.091	F		
4.6.1.3	Effect of variation of voltage (FL)	3841	12	Cimcon	Cimcon	-7.49	2.0% +/- 1Wh	2.091	F		
4.6.1.3	Effect of variation of voltage (FL)	3866	13	Cimcon	Cimcon	-6.59	2.0% +/- 1Wh	2.091	F		
4.6.1.3	Effect of variation of voltage (FL)	3945	14	Cimcon	Cimcon	-7.49	2.0% +/- 1Wh	2.091	F		
4.6.1.3	Effect of variation of voltage (FL)	001350030057BEC8	12	Cimcon	SSN	-6.33	.5% +/- 1Wh	0.591	F		
4.6.1.3	Effect of variation of voltage (FL)	001350030055EB88	14	Cimcon	SSN	-6.79	.5% +/- 1Wh	0.591	F		
4.6.1.3	Effect of variation of voltage (FL)	001350030055EAED	13	Cimcon	SSN	-6.42	.5% +/- 1Wh	0.591	F		
4.6.1.3	Effect of variation of voltage (FL)	001350030055EA21	11	Cimcon	SSN	-6.52	.5% +/- 1Wh	0.591	F		
4.6.1.5	Effect of variation of voltage (LL)	3841	12	Cimcon	Cimcon	-7.96	2.0% +/- 1Wh	2.111	F		
4.6.1.5	Effect of variation of voltage (LL)	4159	11	Cimcon	Cimcon	-19.56	2.0% +/- 1Wh	2.112	F		
4.6.1.5	Effect of variation of voltage (LL)	3841	12	Cimcon	Cimcon	-13.98	2.0% +/- 1Wh	2.112	F		
4.6.1.5	Effect of variation of voltage (LL)	3866	13	Cimcon	Cimcon	NA	2.0% +/- 1Wh		F	Equipment problem kept me from finishing this test.	
4.6.1.5	Effect of variation of voltage (LL)	3945	14	Cimcon	Cimcon	-50.84	2.0% +/- 1Wh	2.112	F		
4.6.2.2	Effect of variation of frequency (FL)	4159	11	Cimcon	Cimcon	-13.23	2.0% +/- 1Wh	2.100	F		
4.6.2.2	Effect of variation of frequency (FL)	3841	12	Cimcon	Cimcon	-12.23	2.0% +/- 1Wh	2.100	F		
4.6.2.2	Effect of variation of frequency (FL)	3866	13	Cimcon	Cimcon	-13.23	2.0% +/- 1Wh	2.100	F		
4.6.2.2	Effect of variation of frequency (FL)	3945	14	Cimcon	Cimcon	-12.23	2.0% +/- 1Wh	2.100	F		
4.6.2.2	Effect of variation of frequency (FL)	001350030055EAED	13	Cimcon	SSN	-6.51	.5% +/- 1Wh	0.600	F		
4.6.2.2	Effect of variation of frequency (FL)	001350030057BEC8	12	Cimcon	SSN	-6.80	.5% +/- 1Wh	0.600	F		
4.6.2.2	Effect of variation of frequency (FL)	001350030055EA21	11	Cimcon	SSN	-6.90	.5% +/- 1Wh	0.600	F		
4.6.2.2	Effect of variation of frequency (FL)	001350030055EB88	14	Cimcon	SSN	-7.10	.5% +/- 1Wh	0.600	F		
4.6.2.3	Effect of variation of frequency (FL)	4159	11	Cimcon	Cimcon	-7.17	2.0% +/- 1Wh	2.100	F		
4.6.2.3	Effect of variation of frequency (FL)	3841	12	Cimcon	Cimcon	-8.17	2.0% +/- 1Wh	2.100	F		
4.6.2.3	Effect of variation of frequency (FL)	3866	13	Cimcon	Cimcon	-7.17	2.0% +/- 1Wh	2.100	F		
4.6.2.3	Effect of variation of frequency (FL)	3945	14	Cimcon	Cimcon	-7.17	2.0% +/- 1Wh	2.100	F		
4.6.2.3	Effect of variation of frequency (FL)	001350030055EAED	13	Cimcon	SSN	-6.46	.5% +/- 1Wh	0.600	F		
4.6.2.3	Effect of variation of frequency (FL)	001350030057BEC8	12	Cimcon	SSN	-6.26	.5% +/- 1Wh	0.600	F		
4.6.2.3	Effect of variation of frequency (FL)	001350030055EA21	11	Cimcon	SSN	-6.56	.5% +/- 1Wh	0.600	F		
4.6.2.3	Effect of variation of frequency (FL)	001350030055EB88	14	Cimcon	SSN	-6.76	.5% +/- 1Wh	0.600	F		
4.6.2.6	Effect of variation of frequency (LL)	001350030055EAED	13	Cimcon	SSN	-0.72	.5% +/- 1Wh	0.600	F		
4.6.2.6	Effect of variation of frequency (LL)	001350030055EA21	11	Cimcon	SSN	-0.92	.5% +/- 1Wh	0.600	F		
4.6.2.6	Effect of variation of frequency (LL)	001350030055EB88	14	Cimcon	SSN	-0.62	.5% +/- 1Wh	0.600	F		
4.6.3	Additional Test (+15%) Volts (FL)	4159	11	Cimcon	Cimcon	-32.47	2.0% +/- 10Wh	2.087	F		
4.6.3	Additional Test (+15%) Volts (FL)	3841	12	Cimcon	Cimcon	-32.47	2.0% +/- 10Wh	2.087	F		
4.6.3	Additional Test (+15%) Volts (FL)	3866	13	Cimcon	Cimcon	-22.08	2.0% +/- 10Wh	2.087	F		
4.6.3	Additional Test (+15%) Volts (FL)	3945	14	Cimcon	Cimcon	-6.50	2.0% +/- 10Wh	2.087	F		
4.6.3	Additional Test (+15%) Volts (FL)	001350030055EAF6	14	Cimcon	SSN	-6.84	.5% +/- 1Wh	0.587	F		
4.6.3	Additional Test (+15%) Volts (FL)	001350030057D29A	12	Cimcon	SSN	-6.76	.5% +/- 1Wh	0.587	F		
4.6.3	Additional Test (+15%) Volts (FL)	001350030057C67E	13	Cimcon	SSN	-100.00	.5% +/- 1Wh	0.587	F	Apparent failure of node on this test. No Wh registered. Relay open. Will not close	
4.6.3	Additional Test (+15%) Volts (FL)	001350030055EA20	11	Cimcon	SSN	-6.50	.5% +/- 1Wh	0.587	F		
4.6.3	Additional Test (+20%) Volts (FL)	4159	11	Cimcon	Cimcon	-21.20	2.0% +/- 10Wh	2.083	F		
4.6.3	Additional Test (+20%) Volts (FL)	3841	12	Cimcon	Cimcon	-21.20	2.0% +/- 10Wh	2.083	F		
4.6.3	Additional Test (+20%) Volts (FL)	3866	13	Cimcon	Cimcon	-21.20	2.0% +/- 10Wh	2.083	F		
4.6.3	Additional Test (+20%) Volts (FL)	3945	14	Cimcon	Cimcon	-21.20	2.0% +/- 10Wh	2.083	F		

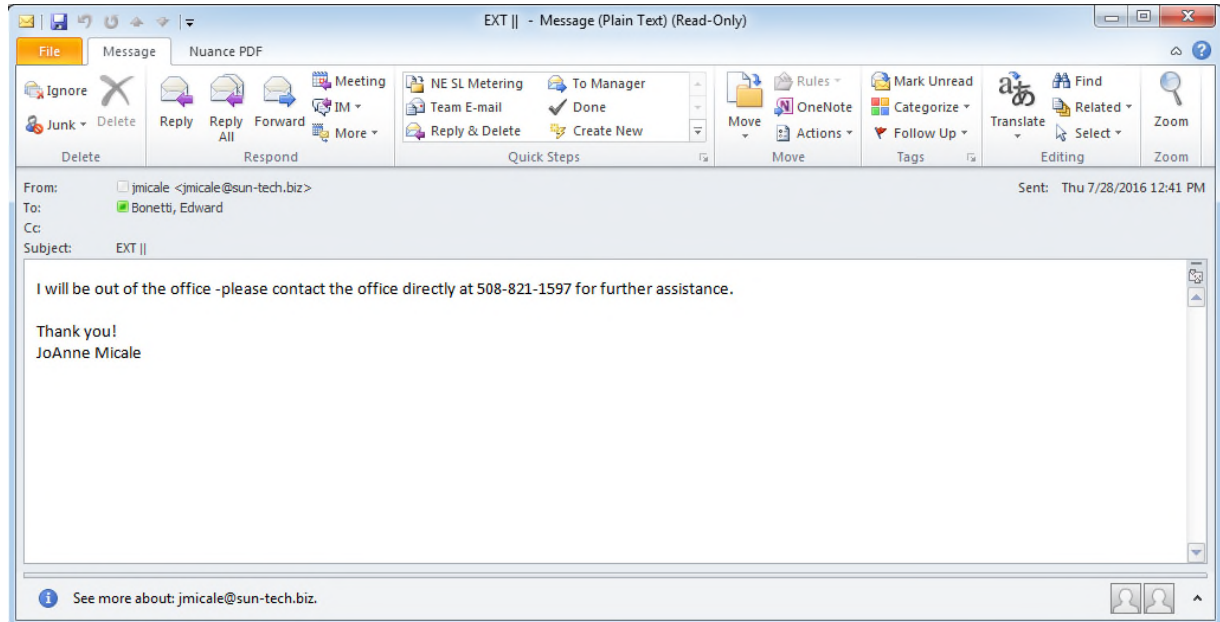
Test#	Description	Node ID	Socket #	Manufacturer	Method	Error %	Expected	P/F Criteria (%)	Pass/Fail	Observations	Notes
4.6.3	Additional Test (+20%) Volts (FL)	001350030055EAF6	14	Cimcon	SSN	-6.76	.5% +/- 1Wh	0.583	F		
4.6.3	Additional Test (+20%) Volts (FL)	001350030057D29A	12	Cimcon	SSN	-6.68	.5% +/- 1Wh	0.583	F		
4.6.3	Additional Test (+20%) Volts (FL)	001350030057C67E	13	Cimcon	SSN	-100.00	.5% +/- 1Wh	0.583	F	Apparent failure of node on this test. No Wh registered. Relay open. Will not close	
4.6.3	Additional Test (+20%) Volts (FL)	001350030055EA20	11	Cimcon	SSN	-6.52	.5% +/- 1Wh	0.583	F		
4.6.3	Additional Test (-15%) Volts (FL)	4159	11	Cimcon	Cimcon	-6.00	2.0% +/- 10Wh	2.118	F		
4.6.3	Additional Test (-15%) Volts (FL)	3841	12	Cimcon	Cimcon	-7.17	2.0% +/- 10Wh	2.118	F		
4.6.3	Additional Test (-15%) Volts (FL)	3866	13	Cimcon	Cimcon	-6.00	2.0% +/- 10Wh	2.118	F		
4.6.3	Additional Test (-15%) Volts (FL)	3945	14	Cimcon	Cimcon	-6.00	2.0% +/- 10Wh	2.118	F		
4.6.3	Additional Test (-15%) Volts (FL)	001350030057D29A	12	Cimcon	SSN	-6.88	.5% +/- 1Wh	0.618	F		
4.6.3	Additional Test (-15%) Volts (FL)	001350030055EA20	11	Cimcon	SSN	-6.65	.5% +/- 1Wh	0.618	F		
4.6.3	Additional Test (-15%) Volts (FL)	001350030057C67E	14	Cimcon	SSN	-100.00	.5% +/- 1Wh	0.618	F	Apparent failure of node on this test. No Wh registered. Relay open. Will not close	
4.6.3	Additional Test (-15%) Volts (FL)	001350030055EAF6	13	Cimcon	SSN	-7.00	.5% +/- 1Wh	0.618	F		
4.6.3	Additional Test (-20%) Volts (FL)	4159	11	Cimcon	Cimcon	-7.60	2.0% +/- 10Wh	2.125	F	Wh for this node went from 12.50 at the end of the last test to 12.31 at the beginning of this one.	This may have been happening for some time. Must recheck data
4.6.3	Additional Test (-20%) Volts (FL)	3841	12	Cimcon	Cimcon	-7.60	2.0% +/- 10Wh	2.125	F	Wh for this node went from 12.50 at the end of the last test to 12.31 at the beginning of this one.	This may have been happening for some time. Must recheck data
4.6.3	Additional Test (-20%) Volts (FL)	3866	13	Cimcon	Cimcon	-6.35	2.0% +/- 10Wh	2.125	F	Wh for this node went from 12.50 at the end of the last test to 12.31 at the beginning of this one.	This may have been happening for some time. Must recheck data
4.6.3	Additional Test (-20%) Volts (FL)	3945	14	Cimcon	Cimcon	-7.60	2.0% +/- 10Wh	2.125	F	Wh for this node went from 12.50 at the end of the last test to 12.31 at the beginning of this one.	This may have been happening for some time. Must recheck data
4.6.3	Additional Test (-20%) Volts (FL)	001350030057D29A	12	Cimcon	SSN	-6.78	.5% +/- 1Wh	0.625	F		
4.6.3	Additional Test (-20%) Volts (FL)	001350030055EA20	11	Cimcon	SSN	-6.66	.5% +/- 1Wh	0.625	F		
4.6.3	Additional Test (-20%) Volts (FL)	001350030057C67E	14	Cimcon	SSN	-100.00	.5% +/- 1Wh	0.625	F	Apparent failure of node on this test. No Wh registered. Relay open. Will not close	
4.6.3	Additional Test (-20%) Volts (FL)	001350030055EAF6	13	Cimcon	SSN	-7.03	.5% +/- 1Wh	0.625	F		
4.6.4	Additional Test (15A)	4159	11	Cimcon	Cimcon	-30.67	2.0% +/- 10Wh	2.102	F	13.51 after power cycle	
4.6.4	Additional Test (15A)	3841	12	Cimcon	Cimcon	-30.67	2.0% +/- 10Wh	2.102	F	13.50 after power cycle	
4.6.4	Additional Test (15A)	3866	13	Cimcon	Cimcon	-30.67	2.0% +/- 10Wh	2.102	F	12.90 after power cycle	
4.6.4	Additional Test (15A)	3945	14	Cimcon	Cimcon	-31.69	2.0% +/- 10Wh	2.102	F	13.51 after power cycle	

Attachment R-II-1-2

CIMCON -

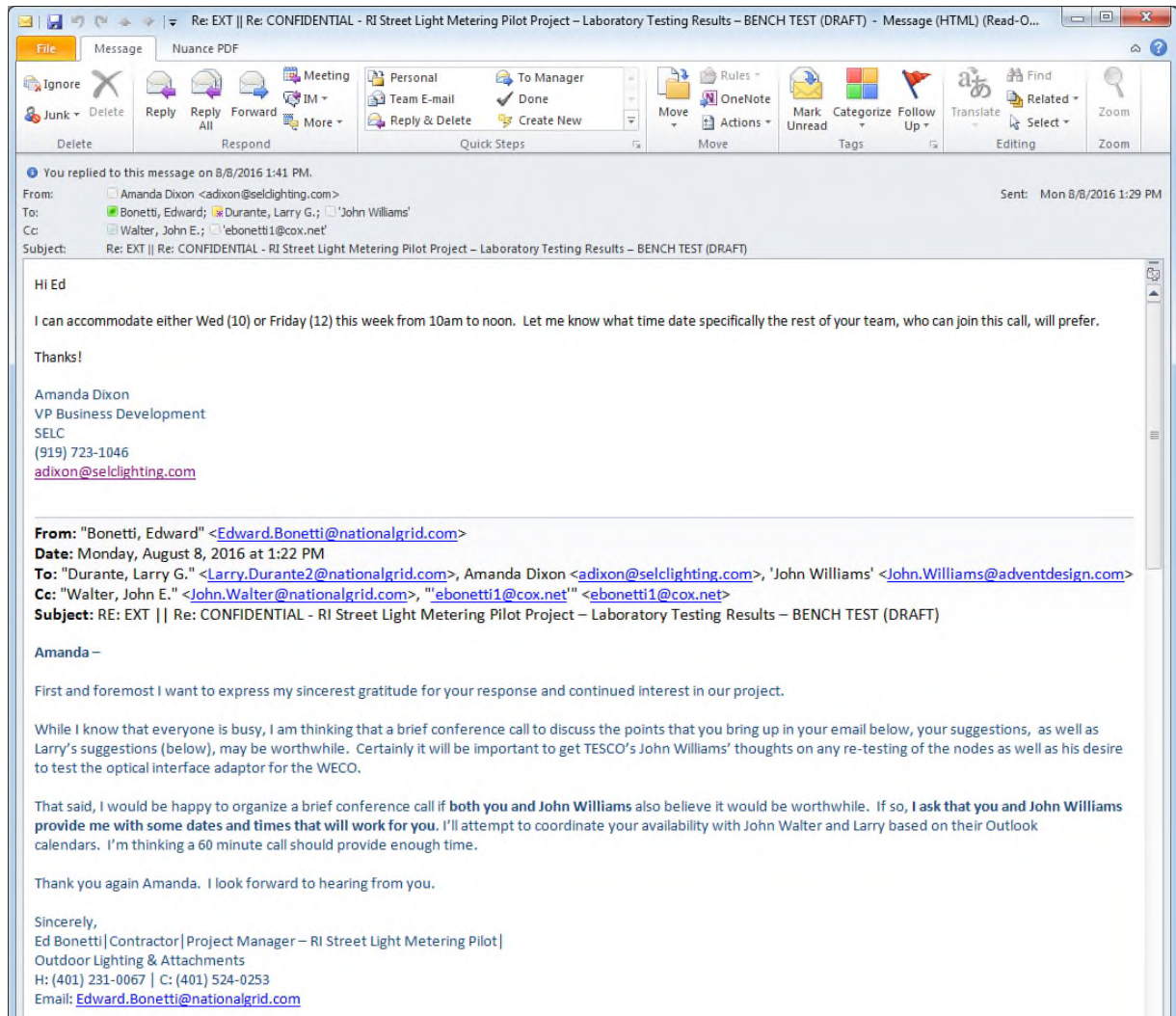


Sunrise Technologies –



(Note: This email is an automated “Out of Office” response.)

Attachment R-II-1-3



Continued on Page 2

From: Durante, Larry G.
Sent: Monday, August 08, 2016 1:04 PM
To: 'Amanda Dixon'; Bonetti, Edward
Cc: Walter, John E.; 'John Williams'; 'ebonetti1@cox.net'
Subject: RE: EXT || Re: CONFIDENTIAL - RI Street Light Metering Pilot Project – Laboratory Testing Results – BENCH TEST (DRAFT)

Hi Amanda,

May I recommend that you ensure your calibration instrumentation be calibrated periodically and traceability to NIST be maintained.

I do know this formality and documentation of same will be required for approval to use the product in NYS.

Hi Ed,

Please have the most recent units, once manufactured, retested by TESCO and reported to National Grid and results also provided, as a courtesy, to this manufacturer.

thank you,

Larry

Larry Durante, PE
National Grid
Manager, Labs
315.447.2235

From: Amanda Dixon [<mailto:adixon@selclighting.com>]
Sent: Monday, August 08, 2016 12:57 PM
To: Bonetti, Edward
Cc: Durante, Larry G.; Walter, John E.; John Williams; 'ebonetti1@cox.net'
Subject: EXT || Re: CONFIDENTIAL - RI Street Light Metering Pilot Project – Laboratory Testing Results – BENCH TEST (DRAFT)

Hi Ed

Our team has reviewed the results, and comments. We know the calibration details shows around a 1%-2% accuracy level for some of our nodes.

The data reported matches what we have found during our detailed analysis of the calibration system we currently use. We have identified an offset error and a gain error during calibration that have caused the high readings.

We have tested modifications to the calibration setup and verified that we can obtain much better accuracy with these changes, which we believe will satisfy your test requirements.

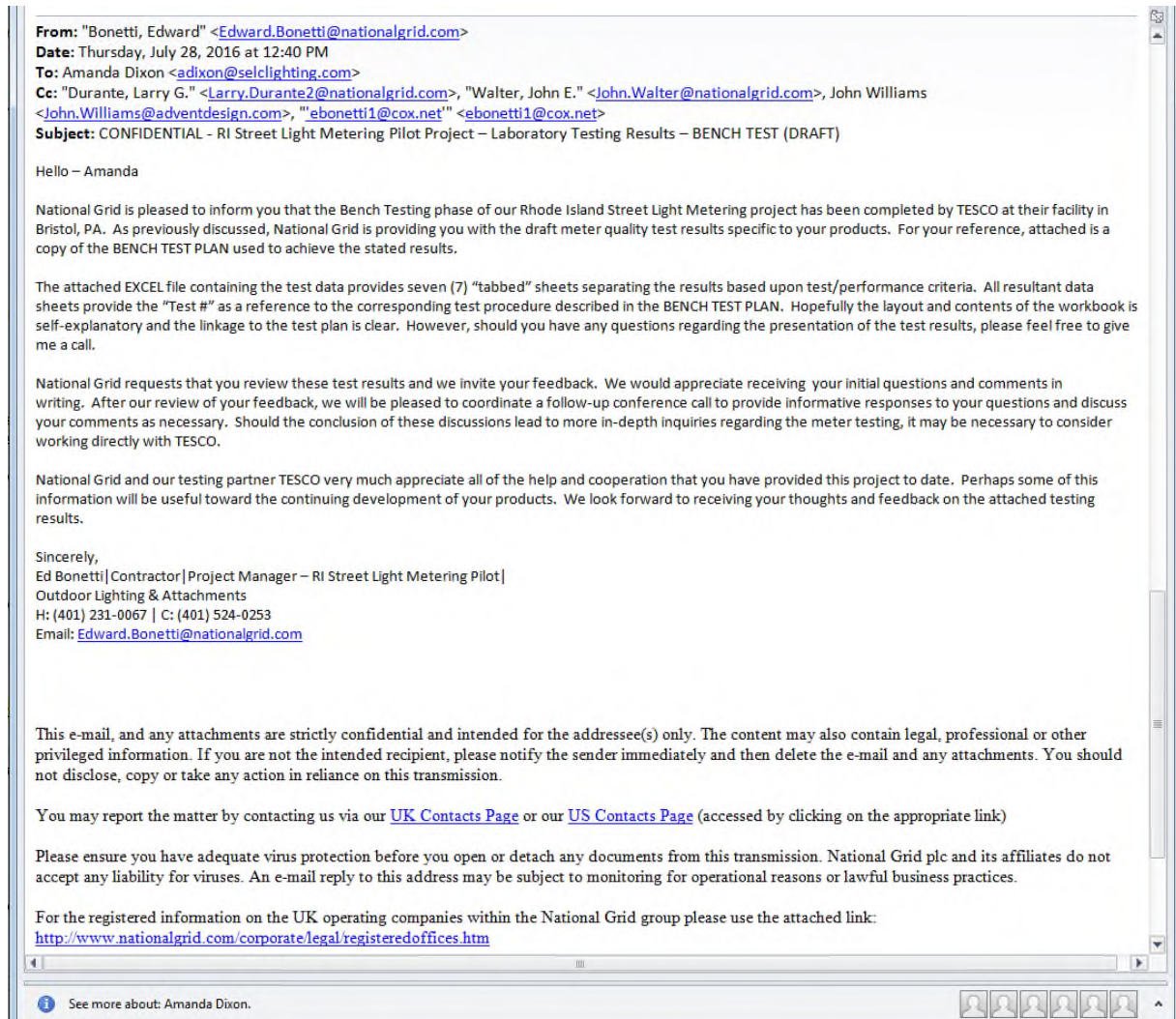
We are currently performing an upgrade to the production calibration unit and will be able to produce nodes on the upgraded production tester at the end of August.

We've also added an optical interface that communicates the metering measurements of the node without having to go through the radio card network. The only requirement needed to test our unit is to have an adapter for your WECO that can interface through a 7 or 3 pin receptacle. Would TESCO be interested in testing this unit? If so, we can send 2-4 units (whatever is needed for John Williams) for a bench test. I know this request, extends the services of asking TESCO to support another bench test, so please let me know your preference. I look forward to hearing back from you.

Best Regards-

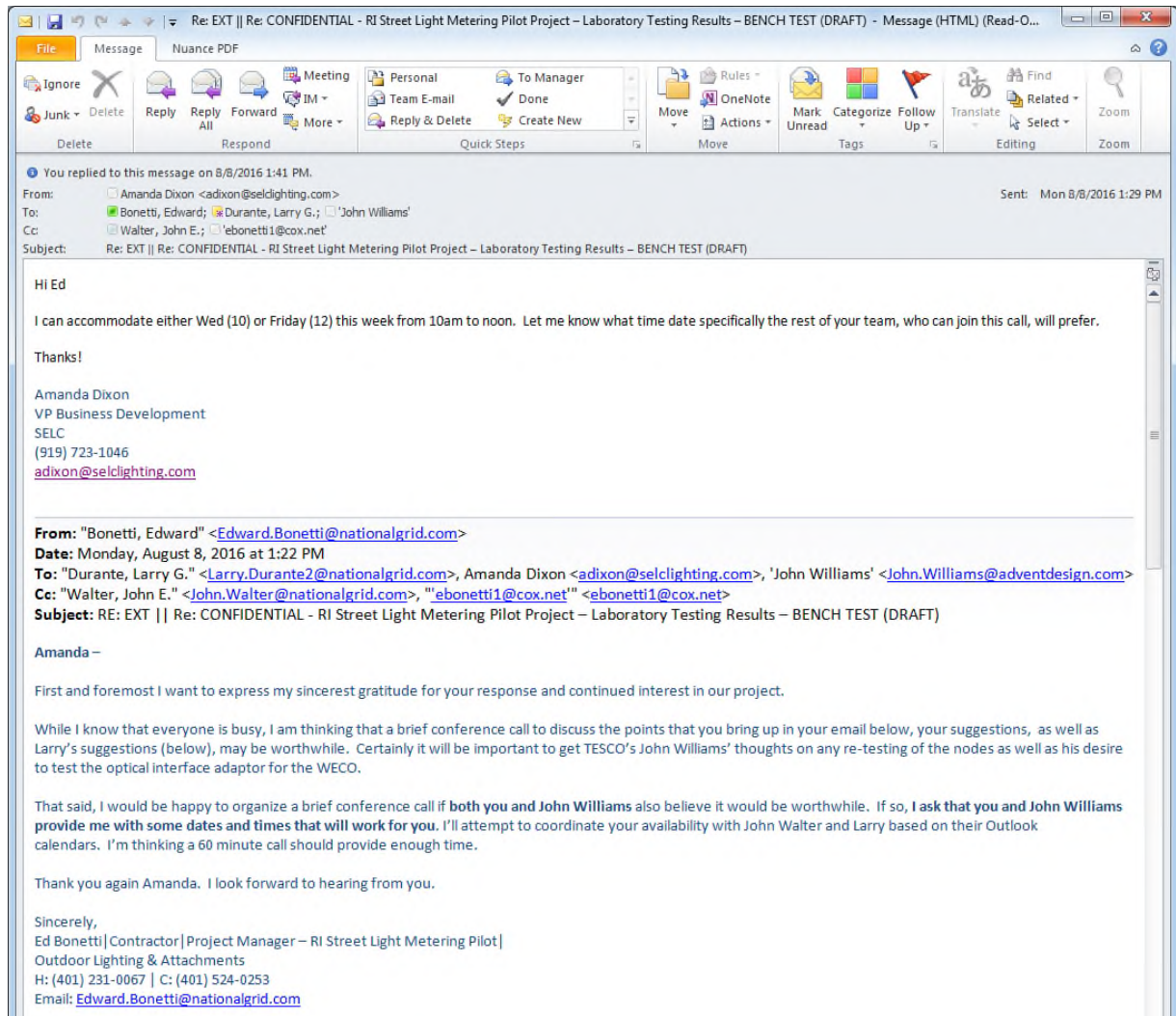
Amanda Dixon
VP Business Development
SELC
(919) 723-1046
adixon@selclighting.com

Continued on Page 3



End of Email

Attachment R-II-1-3



Continued on Page 2

From: Durante, Larry G.
Sent: Monday, August 08, 2016 1:04 PM
To: 'Amanda Dixon'; Bonetti, Edward
Cc: Walter, John E.; 'John Williams'; 'ebonetti1@cox.net'
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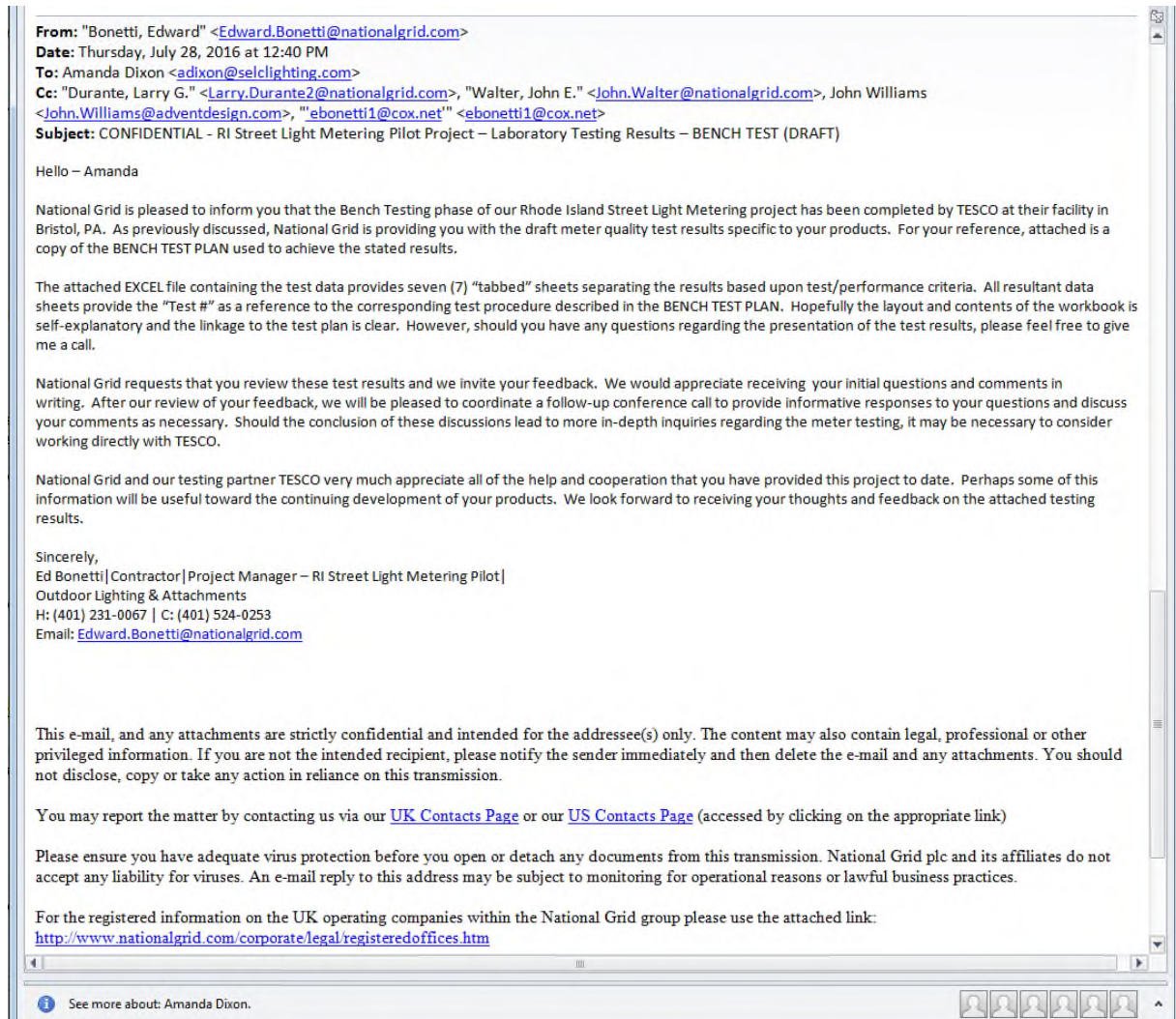
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Best Regards-

Amanda Dixon
VP Business Development
SELC
(919) 723-1046
adixon@selclighting.com

Continued on Page 3



End of Email



December 7, 2016

John Walter
Principal Engineer
National Grid
280 Melrose Street
Providence, RI 02907

Dear Mr. Walter,

Thank you again for taking time yesterday to discuss the results of the metrology testing of our iSLC-3100 Street Light controller which was conducted by TESCO.

In reviewing the results, our controllers were primarily tested at loads of 0A, 10mA, 1A and 10A, with optional testing being conducted at 0.5A and at 15A. The results of the tests at 0A, 0.5A, and 1A were excellent, meeting or exceeding the accuracy specification for 34 of the 35 tests, with 1 test excluded due to unexplained equipment malfunction.

The other results from the tests, those conducted at loads of 10mA, 10A and 15A, were outside of specifications but for clearly identifiable reasons. CIMCON Lighting's iSLC-3100 is rated for 960W, which results in an 8A load at 120VAC. So we only calibrate our meter to 8.5A, which would be on the high limit of our load specification. So the tests conducted at 10A and 15A were outside of our calibration range.

As for the tests conducted with a load of 10mA, the reason that accurate values were not reported is because we establish a Current Creep Limit (CCL) in the firmware of our controller, and any current value measured below this CCL is reported as 0A. The CCL is calculated to be 10% of full load of the fixture, but with a Minimum limit of 30mA and a Maximum limit of 100mA. So because the tests conducted at a load of 10mA was below our Minimum CCL of 30mA, the reported current value 0A resulted in a 100% error.

If future testing is conducted, we can modify the CCL firmware to allow us to read down to 10mA if that's desired, and we can modify our meter calibration to extend up to 10A. But we're completely confident that any testing between our CCL and 8.5A would fall within our specifications, which I trust the test results from the test at loads of 0.5A and 1A demonstrate.

I hope this information is helpful and clarifies the test results. We appreciate being included in this testing and look forward to working with National Grid on various Smart Lighting Control projects across your territories. If I can ever be of any assistance, please don't hesitate to contact me.

Warm regards,

Mark Carter
Director, Sales - Northeast
CIMCON Lighting, Inc.

Division R-II-2

Request:

Provide a copy of the manufacturers' feedback noted in Mr. Walter's Rebuttal Testimony on page 14, lines 10 through 13.

Response:

On March 3, 2016, the Company provided Sunrise Technologies with an initial draft of the Company's laboratory test plan (see Attachment R-II-2-1). On March 4, 2016, the Company held a conference call with TESCO and Sunrise Technologies. The participants in the call included Edward Bonetti from National Grid, John Williams from TESCO, and Joanne Micale and Vance Spilman from Sunrise Technologies. During the call, the Company confirmed the use of ANSI C12.20 meter testing protocols because the forthcoming ANSI C136 NLC metering standard (proposed as ANSI C136.50) was still in development. Mr. Spilman stated that the forthcoming ANSI C136 standard, when completed, would specify a 15A current load criterion, and he expressed concern that the present 10A current load was too low. Mr. Bonetti stated that consideration was being given to optional "non-ANSI" tests, of which one included a 15A current load should project time and resources permit the testing. Mr. Spilman cited several examples in which lighting circuit loads controlled by a single networked lighting control (NLC) could exceed the 10A criterion, and therefore stressed the need to minimally test at the 15A load criterion.

The Company considered the feedback from this conference call, as described in Attachment R-II-2-2, and eventually included "optional" test protocols within the later revision (revision 3) of the laboratory test plan that was issued to all participating NLC manufacturers.

Division R-II-3

Request:

What are the impediments to the Company installing metering at each transformer feeding the streetlights to achieve a revenue metering accuracy? Can such a redundant metering system increase the confidence and use of the NLC technology adoption on a pilot basis?

Response:

A typical service voltage electric circuit used to energize street lights is often configured to provide electric service to other non-lighting customers. This circuit configuration is predominant in overhead primary/secondary electric distribution with wood pole supported orientation (overhead), but may also be present in certain underground network circuit arrangements. Dedicated street lighting electric circuits may exist from a transformer source within certain urban and suburban underground circuit applications, including many underground residential distribution (URD) systems.

Street lights that are electrically sourced from an overhead service conductor are typically fed from an individual tap of the service conductor. This design would require either (a) an individual meter and meter drop installation at each individual distribution pole having a street light; or (b) the redundant installation of a separate, parallel, dedicated street light service voltage conductor on each wood pole from the transformer to the last affected street light.

Specific dedicated underground street light circuits, which are constructed from a designated distribution transformer source that services only street light electric loads, can be reconfigured to facilitate the installation of a meter pedestal to manage a street light's energy consumption. Similarly, a meter pedestal installation could be configured within existing URD street lighting systems; however, those dedicated street lighting circuits typically source only one or two street lights each.

Based upon the efficient and economic electric circuit designs presently used for sourcing street lighting, the identified infrastructure changes and accompanying costs represent the impediments associated with utilizing existing standard revenue grade electric meters for street lighting applications. For these reasons, and with former lighting technologies operating on a consistent standard dusk-to-dawn schedule, the industry has accepted the unmetered street lighting energy consumption billing approach.

Division R-II-3, page 2

The redundant metering systems are a means to assess the relative accuracy of the networked lighting control (NLC) technology against the standard revenue grade meter as the baseline. This approach is founded on the basis that the aggregated meter reads of all individual NLCs are to be compared to the electrical load measured on the entire electric circuit by the standard revenue grade meter. As referenced in the Rebuttal Testimony of John E. Walter, throughout the various testing phases the Company experienced operational or performance incidents associated with either the street light, NLC, or the network service/head-end system, which impacted the circuit's aggregate NLC energy consumption measure. These incident occurrences, whether identified or unidentified, resulted in dissimilar meter readings over the designated period, which reduced the Company's confidence of the NLC technology. However, the cause of the Company's reduced confidence level is not only associated with the inherent accuracy of the integrated circuit meter, but also with the anomalies associated with other functions of the overall technology.

Additionally, the Company performed redundant metering system application tests during the Stage 1-Phase 2 field application testing portion of the Street Light Metering Pilot (Pilot). Although several field application test results have been contested due to the inclusion of inadvertent ancillary electrical loads, the testing performed at the Rhode Island Department of Transportation Park and Ride locations replicated the physical conditions described in this request. The Park and Ride testing included all three manufacturer's NLCs functioning under several varied operating schedules. The comparative energy consumption measurement results of these Park and Ride tests, including the unmetered calculation (Calculated), aggregate NLC determination (XML Data), and the standard revenue grade meter readings (NGrid Meter), can be found in Attachments 16 and 17 of the Pilot's Final Report dated November 21, 2017.

Division R-II-4

Request:

Provide a copy of the Memorandum of Understanding and any Non-Disclosure Agreement executed between CIMCON and National Grid associated with the street lighting pilot.

Response:

Please see Attachment R-II-4-1 for a copy of the executed Memorandum of Understanding between CIMCON and National Grid.

Please see Attachment R-II-4-2 for a copy of the executed Non-Disclosure Agreement between CIMCON and National Grid.

MEMORANDUM OF UNDERSTANDING

METERING PILOT PROJECT

This **Memorandum of Understanding** (this "**MOU**") is effective as of November 1, 2015 ("**Effective Date**"), by and between CIMCON Lighting, Inc. ("**CIMCON**") and The Narragansett Electric Company d/b/a National Grid ("**National Grid**" or "**Company**"). Each referred to herein as a "**Party**" and collectively as the "**Parties**".

RECITALS

WHEREAS, in compliance with the Rhode Island Public Utilities Commission ("**RI PUC**") Docket No.4513 National Grid will execute an evaluation plan which is detailed in a document entitled "Street Light Metering Pilot" dated, and submitted to the RI PUC on, July 27, 2015 and proposes to evaluate new metering technology for its compatibility with street lighting applications ("**Project**"); and

WHEREAS, the Rhode Island Department of Transportation ("**RI DOT**") pilot project changes include utilizing Silver Spring Networks, Inc. ("**SSN**") as its sole network communications service provider and SSN compatible street light control devices manufactured by CIMCON Lighting, Inc. ("**CIMCON**") which incorporate integrated circuit ("**IC**") meter technology, manufactured by Cirrus Logic, Inc.; and

WHEREAS, for the Project: (i) the Company intends to work with the RI DOT for the field testing portion of the Project, leveraging RI DOT's relationship with SSN and CIMCON; (ii) for Project testing purposes, the Company may temporarily substitute (unless otherwise agreed upon by the Parties) other manufactures' IC metering technology at select field locations, permitted by RI DOT; and (iii) during the Project laboratory testing, the Company intends to test both SSN and CIMCON's network communications platforms as well as several manufactures' IC meter technology; and

WHEREAS, National Grid currently offers street lighting as an unmetered service that relies on fixed operating schedules and industry standard light source wattage ratings to determine energy consumption; and

WHEREAS, under the Street Lighting Metering Pilot National Grid will review the accuracy and capabilities of various IC meter technologies available for street lights which may be helpful in providing the Company with various forms of location specific meter data, such as actual time-of-use energy consumption, to test meter accuracy.

NOW, THEREFORE, in consideration of the mutual covenants set forth herein the Parties have the following understanding:

1. **Purpose.** The purpose of this MOU is to set forth the Parties' mutual understanding of the of the roles, responsibilities, and commitments associated with achieving the Objectives in connection with the Project as well as to continue to develop and expand a framework of cooperation and collaboration between the Parties to facilitate the successful completion of this Project in compliance with RI PUC Commission Docket # 4513.

- o The Project is an effort by the Company to execute the evaluation plan set forth under Street Light Metering Pilot document which is comprised of four key components: (i) laboratory testing, (ii) field testing, (iii) information system integration study and (iv) metered/unmetered bill comparison.
- o As part of the laboratory testing component of the Project, the Company proposes to engage a specialty meter testing firm in order to establish a controlled laboratory environment. The laboratory will be used to conduct a complete technical evaluation of CIMCON IC metering devices as well as an end-to-end performance evaluation of the

SP

network communication platform. A functional "meter farm" laboratory test environment will be established to facilitate end-to-end testing.

- o As a part of the field testing component of the Project, the Company proposes to engage the RI DOT in order that the Company may utilize the street lighting infrastructure for the purpose of observing operational information of the street lighting system to be provided by the RI DOT's vendor, CIMCON. CIMCON will collect and/or manage energy consumption data from the IC meters located at specific individual street light luminaires.
- o As part of the information system integration study component of the Project, the Company plans to assess the information system and billing-related impacts associated with adopting the CIMCON IC meter technology and networked communications platform. To that end, this MOU proposes to engage CIMCON, as necessary, in order to obtain information from laboratory and field testing. The Company also will work with CIMCON network solution architects and other necessary CIMCON resources. Doing so will help the Company to identify the requirements necessary to scope the information system interfaces and ensure compatibility with Company data management and billing systems.
- o The objectives of the Project are to: (i) review the accuracy, reliability, and other capabilities of various IC meter technologies available for street lights which may be helpful in providing the Company with various forms of location specific meter data; (ii) monitor and assess related data transmission functionality of the networked intelligent wireless street lighting control equipment installed as part of the RI DOT pilots; and (iii) use the information obtained from laboratory and field testing to identify the requirements necessary to scope the information systems interfaces (collectively, the "Objectives").

2. Scope of Work. The Company and CIMCON will work together in good faith to execute the Project in order to meet the Objectives. The RI DOT will allow National Grid to perform field testing on street lights at various RI DOT locations including, but not limited to the following:

- (i) DOT Pilot Phase 1 (I 295 / Rt 44 – Exit 7 Smithfield)
- (ii) DOT Pilot Phase 2 (I 295 / Rt 146 North & South Project)
- (iii) DOT Pilot Phase 3 ("Park and Ride Locations")

The Company plans to use the services of a specialty meter testing firm, such as The Eastern Specialty Company (TESCO) to provide consultation as well as physically conduct the laboratory testing (IC meter test program development, execution, and oversight). Although CIMCON will not create the laboratory testing environment, CIMCON will create the plan/model for an end-to-end system application within the laboratory environment. The actual laboratory environment will be created by the designated meter testing firm.

The Company will use the technical knowledge and research capabilities of the Battelle Memorial Institute, Pacific Northwest Division (the "BATTELLE"), under its own right and under the authority of Contract No. DE-AC05-76RL0 1830 for the management and operation of the Pacific Northwest National Laboratory for the U.S. Department of Energy ("PNNL") to provide independent consultation, supervision and oversight during the laboratory and field testing components of the project. Subject to Section 14 below, the Parties understand that for PNNL's participation, PNNL plans to utilize knowledge, data and information gained from this Project in its industry reports and publications.

3. Intent of the Parties.

The Company will work with the RI DOT, and its vendor, CIMCON, for the field testing portion of the Project. The field testing will utilize street lighting infrastructure and network-control applications that are currently being evaluated in various separate RI DOT pilots. The Company will monitor and assess the independent IC meter technology performance, communication network operation, and related data

transmission functionality of the networked intelligent wireless street lighting control equipment installed as a part of the RI DOT pilots.

Further, the Company will work with CIMCON, for the laboratory testing and information systems integration portions of the Project. The Company will test CIMCON's IC meter technology as well as CIMCON's network services in the laboratory environment.

To that end:

- (i) For the field testing portion of the Project, the RI DOT will have, or will procure, IC metering devices from CIMCON and to allow National Grid to request, access and use, Data obtained from CIMCON which includes but is not limited to, the energy consumption meter data, operating characteristics and system wattage.

Roadway Locations. The RI DOT will allow National Grid to place its own CIMCON meter devices on street lights at various RI DOT roadway locations including the RI DOT Pilot Phase 1 and RI DOT Pilot Phase 2 Roadway Locations.

Park and Ride Locations. The RI DOT will further allow National Grid to place its own meter devices on street lights at various RI DOT Park and Ride locations including the RI DOT Pilot Phase 3 Park and Ride Locations.

- (ii) The Company will procure its own CIMCON meter devices, where needed, for installation and use on street lights for the laboratory and field and laboratory portions of the Project.

(iii) CIMCON will provide, on a temporary basis, loan to the Company, all components necessary to establish the network communications platform, including CIMCON hardware, software, and an estimated 10 meter devices, etc., for the test farm application in the laboratory testing environment. CIMCON will assist and advise the Company as necessary to ensure its proper installation, set-up, and use.

(iv) The Company and CIMCON will cooperate and collaborate in good faith to simulate various conditions in the laboratory and field and/or alternate performance levels/operating schedules to test the full spectrum of operations and functionality of the metering devices and associated communications networks.

(v) To ensure the proper evaluation of information systems compatibility, integration/interface requirements, network communications/data transmission, security, etc., Cimcom will cooperate and collaborate in good faith with the Company. CIMCON will provide network solution architects and other necessary resources to work with the Company's information systems (IS) resources to scope the integration efforts required to fully assimilate the metering head-end system for meter data transmission with the Company's back-office systems.

(vi) CIMCON will provide all necessary training, coaching and counselling on the proper use and set up of its products (equipment, hardware, software, networks, etc.) to Company and its specialty meter testing contractor (e.g. TESCO) to facilitate successful completion of this Project.

4. Resources. The Parties will allocate the necessary business resources for the implementation of the Project. National Grid will allocate one program manager and an appropriate team which will be under the direction of National Grid. CIMCON will allocate an appropriate team and designate a primary contact having appropriate Project related decision authority which shall be under the direction of CIMCON.

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5. Costs. All costs and expenses incurred by a Party in connection with the Project shall be borne solely by the Party that incurred such costs or expenses, unless otherwise agreed upon in writing by the Parties.

6. Term and Termination. The term of this MOU will commence on the Effective Date and end on the latter of September 30, 2016 or National Grid's filing date of final findings and conclusions after completion of the Project ("Term"). This MOU may be terminated at any time, for any reason, by the Company or CIMCON, after providing to the other Party at least sixty (60) days advance written notice of intent to terminate.

7. No Joint Venture. By execution of this MOU, the Parties are not creating any joint venture, agency, partnership or fiduciary obligations between the Parties. Rather, the Parties are independent contractors and neither Party has any power to bind the other Party for any purpose.

8. Amendments. This MOU may only be amended or modified by a written memorandum of understanding signed by both Parties.

9. Legal Effect. This MOU is a written commitment between the Parties to execute the Project. The MOU (including specifically the Recitals) is not intended to, and does not, create any legally binding obligations or liabilities on the Parties of this MOU.

10. Notices. Any notice, request or other communication required or permitted to be given under this MOU must be in writing and will be sent by one of the following means: electronic mail, facsimile transmission, hand delivery or courier to the other Party at the addresses set forth below:

CIMCON: CIMCON Lighting, Inc.
Attn: Tod Riedel
234 Littleton Road, Westford MA, 01886
Phone: (978) 692-9868 ext. 235
Email: tod.riedel@cimconlighting.com

National Grid: National Grid
Outdoor Lighting and Attachments
Attn: John Walter
144 Kensington Ave.,
Buffalo NY 14214
Phone: (716) 831-7739
Email: John.Walter@nationalgrid.com

Any such notice, request or other communication shall be deemed to have been duly given or made and to have become effective at the time of receipt thereof if received during normal business hours in the place of receipt, or otherwise at the opening of business on the business day in the place of receipt, immediately following the day of receipt. Notices given hereunder by electronic mail or facsimile will be deemed to have been effectively given the day indicated on the confirmation accompanying the electronic submission or facsimile. Any Party may, by written notice to another Party, change the referenced responsible contact and/or address to which notices, requests or other communications to such Party are to be delivered.

11. Headings. The headings of the Sections of this MOU are inserted for convenience only and do not constitute a part hereof or affect in any way the meaning or interpretation of this MOU.

12. Entire MOU. This MOU constitutes the entire understanding between the Parties hereto with respect to the subject matter herein and supersede and cancel any prior written understandings or MOUs, whether oral or written, between the Parties relating to the subject matter herein.


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13. **Assignment.** This MOU may not be assigned by either Party without the express written consent of the other Party, except that National Grid may assign this MOU to an Affiliate without consent. For the purposes of this MOU "Affiliate" means any person controlling, controlled by, or under common control with, any other person; "control" shall mean the ownership of, with right to vote, 50% or more of the outstanding voting securities, equity, membership interests, or equivalent, of such person.


14. **Publicity.** The Parties understand that PNNL will not issue any press release, publish any reports or other documents or otherwise make any publication in connection with this MOU, the Project or Street Light Metering Pilot without the review and prior written consent of National Grid, RI DOT, CIMCON and/or SSN if and to the extent that any press release, reports, documents or publication contains the information of National Grid, RI DOT, CIMCON and/or SSN.

IN WITNESS WHEREOF, this MOU has been executed by authorized representatives of the Parties as of the Effective Date.

CIMCON Lighting Inc.

By: 
Name: _____
Title: TOD RIEDEL
VP, BUSINESS DEVELOPMENT

The Narragansett Electric Company d/b/a National Grid

By: 
Name: Edward Lombardi
Title: MANAGER OUTDOOR LIGHTING & ATTACHMENTS
12/1/2015

NON-DISCLOSURE AGREEMENT

This Non-Disclosure Agreement ("Non-Disclosure Agreement") dated as of November 1, 2015 (the "Effective Date"), between CIMCON Lighting, Inc. (the "Contractor"), a Delaware corporation having offices at 234 Littleton Road, Westford, MA 01886 and The Narragansett Electric Company d/b/a National Grid ("National Grid"), a Rhode Island corporation, having offices at 280 Melrose Street, Providence, RI 02907 (each, individually, a "Party" and, collectively, the "Parties").

RECITALS

WHEREAS, the Parties and their respective Affiliates (as such term is defined below) possess certain confidential and proprietary Information (as such term is defined below); and

WHEREAS, each Party may elect, in its sole discretion, to disclose Information to the other Party, its Representatives (as such term is defined below) or its Affiliates in connection with National Grid conducting an evaluation of new metering technology for its compatibility with street lighting applications as detailed in a document entitled "Street Light Metering Pilot" dated, and submitted to the Rhode Island Public Utilities Commission on July 27, 2015 (the "Purpose"), subject to the terms and conditions of this Non-Disclosure Agreement.

NOW, THEREFORE, in consideration of the mutual covenants contained herein and for other good and valuable consideration, the sufficiency and receipt of which are hereby acknowledged, the Parties agree as follows:

§1. Certain Definitions.

(a) The term "Information" means

(i) all financial, technical and other non-public or proprietary information which is furnished or disclosed orally, in writing, electronically or in other form or media by the Disclosing Party, its Representatives or its Affiliates to the Recipient, its Representatives or its Affiliates in connection with the Purpose and that is described or identified (at the time of disclosure) as being non-public, confidential or proprietary, or the non-public or proprietary nature of which is apparent from the context of the disclosure or the contents or nature of the information disclosed; and

(ii) all memoranda, notes, reports, files, copies, extracts, inventions, discoveries, improvements or any other thing prepared or derived from the information described in §1(a)(i), above.

(b) The term "Recipient" means a Party to whom the other Party, its Representatives or its Affiliates discloses Information in its possession.

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(c) The term "Disclosing Party" means the Party disclosing Information in its possession, or on whose behalf Information is disclosed, to a Recipient.

(d) The term "Representative(s)" means the officers, directors, managers, partners, members, shareholders, employees, agents, attorneys, accountants, contractors and advisors of a Party or its Affiliates.

(e) The term "Affiliate" means any person controlling, controlled by, or under common control with, any other person; "control" shall mean the ownership of, with right to vote, 50% or more of the outstanding voting securities, equity, membership interests, or equivalent, of such person.

§2. Permitted Disclosure. Recipient shall receive all Information in strict confidence, shall exercise reasonable care to maintain the confidentiality and secrecy of the Information, and, except to the extent expressly permitted by this Non-Disclosure Agreement, shall not divulge Information to any third party without the prior written consent of the Disclosing Party. The foregoing notwithstanding, the Recipient may disclose Information to its Representatives and Affiliates to the extent each such Representative and Affiliate has a need to know such Information for the Purpose contemplated by this Non-Disclosure Agreement and agrees to observe and comply with the obligations of the Recipient under this Non-Disclosure Agreement with regard to such Information. The Recipient shall immediately notify the Disclosing Party regarding, and shall be responsible hereunder for, any breach of the terms of this Non-Disclosure Agreement to the extent caused by any of its Representatives and Affiliates.

§3. Exclusions from Application.

This Non-Disclosure Agreement shall not apply to Information that,

(i) at the time of disclosure by or on behalf of the Disclosing Party hereunder, is in the public domain, or thereafter enters the public domain without any breach of this Non-Disclosure Agreement by the Recipient or any of its Representatives or Affiliates,

(ii) is rightfully in the possession or knowledge of Recipient, its Representatives or its Affiliates prior to its disclosure by or on behalf of the Disclosing Party,

(iii) is rightfully acquired by Recipient, its Representatives or its Affiliates from a third party who is not under any obligation of confidence with respect to such Information, or

(iv) is developed by Recipient, its Representatives or its Affiliates independently of the Information disclosed hereunder by or on behalf of the Disclosing Party (as evidenced by written documentation).

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§4. Production of Information. The Recipient agrees that if it, or any of its Representatives or Affiliates, is required by law, by a court or by other governmental or regulatory authorities (including, without limitation, by oral question, interrogatory, request for information or documents, subpoena, civil or criminal investigative demand or other process) to disclose any of the Disclosing Party's Information, the Recipient shall provide the Disclosing Party with prompt notice of any such request or requirement, to the extent permitted to do so by applicable law, so that the Disclosing Party may seek an appropriate protective order or waive compliance with the provisions of this Non-Disclosure Agreement. If, failing the entry of a protective order or the receipt of a waiver hereunder, the Recipient (or any Representative or Affiliate of the Recipient) is, in the opinion of its counsel, legally compelled to disclose such Information, the Recipient may disclose, and may permit such Representative to disclose, that portion of the Information which its counsel advises must be disclosed and such disclosure shall not be deemed a breach of any term of this Non-Disclosure Agreement. In any event, the Recipient shall use (and, to the extent applicable, shall cause its Representatives and Affiliates to) use reasonable efforts to seek confidential treatment for Information so disclosed if requested to do so by Disclosing Party, and shall not oppose any action by, and shall reasonably cooperate with, the Disclosing Party to obtain an appropriate protective order or other reliable assurance that confidential treatment will be accorded the Information.

§5. Scope of Use. Recipient shall, and shall cause its Representatives and Affiliates to, use Information disclosed by or on behalf of the Disclosing Party solely in connection with the Purpose and shall not, and shall cause its Representatives and Affiliates not to, use, directly or indirectly, any Information for any other purpose without the Disclosing Party's prior written consent.

§6. No Representations; No Rights Conferred. Disclosing Party makes no representations or warranties, express or implied, with respect to any Information disclosed hereunder, including, without limitation, any representations or warranties as to the quality, accuracy, completeness or reliability of any such Information; all such representations and warranties are hereby expressly disclaimed. Neither the Disclosing Party nor its Representatives or Affiliates shall have any liability whatsoever with respect to the use of, or reliance upon, the Information by the Recipient, its Representatives or its Affiliates. Neither Recipient, its Representatives nor its Affiliates shall acquire any rights in Information by virtue of its disclosure hereunder. No license to Recipient, its Representatives or its Affiliates under any trademark, patent, or other intellectual property right, is either granted or implied by the disclosure of Information under this Non-Disclosure Agreement.

§7. Return or Destruction of Information. Recipient shall return and deliver, or cause to be returned and delivered, to the Disclosing Party, or destroy or cause to be destroyed (with certification of destruction delivered to Disclosing Party), all tangible Information, including copies and abstracts thereof, within thirty (30) days of a written request by the Disclosing Party (a "Request"). The foregoing notwithstanding, Recipient may retain one copy of such Information for archival purposes only and subject to compliance with the terms of this Non-Disclosure Agreement. Notwithstanding the foregoing, each Party agrees that the Recipient shall not be required to return to the Disclosing Party, or destroy, copies of Disclosing Party's Information

that (A) reside on the Recipient's or its Affiliates' backup, disaster recovery or business continuity systems, or (B) that the Recipient or its Affiliates are obligated by applicable law and/or governmental regulations to retain. The Recipient agrees that, following its receipt of the Request, it shall neither retrieve nor use the Disclosing Party's Information for any purpose other than that specified in clause (B) above.

§8. No Partnership, Etc. Nothing contained herein shall bind, require, or otherwise commit a Party (or any Affiliate thereof) to proceed with any project, sale, acquisition, or other transaction of or with the other Party or any other entity. No agency, partnership, joint venture, or other joint relationship is created by this Non-Disclosure Agreement. Neither this Non-Disclosure Agreement nor any discussions or disclosures hereunder shall prevent any Party from conducting similar discussions with other parties or performing work, so long as such discussions or work do not result in the disclosure or use of Information in violation of the terms of this Non-Disclosure Agreement. The terms of this Non-Disclosure Agreement shall not be construed to limit any Party's right to independently engage in any transaction, or independently develop any information, without use of any other Party's Information.

§9. Term and Termination. Recipient's obligations and duties under this Non-Disclosure Agreement shall have a term of five (5) years from the Effective Date (the "Term"). Either Party may terminate this Non-Disclosure Agreement by written notice to the other Party. Notwithstanding any such termination, all rights and obligations hereunder shall survive for the Term for all Information disclosed prior to such termination.

§10. Injunctive Relief. The Parties acknowledge that a breach of this Non-Disclosure Agreement by Recipient may cause irreparable harm to the Disclosing Party for which money damages would be inadequate and would entitle the Disclosing Party to injunctive relief and to such other remedies as may be provided by law.

§11. Governing Law; Consent to Jurisdiction. This Non-Disclosure Agreement shall be governed and construed in accordance with the laws of the State of Rhode Island without regard to the principles of the conflict of laws contained therein. Each Party hereby submits to the personal and subject matter jurisdiction of the courts of the State of Rhode Island for the purpose of interpretation and enforcement of this Non-Disclosure Agreement.

§12. Amendments. This Non-Disclosure Agreement may be amended or modified only by an instrument in writing signed by authorized representatives of all Parties.

§13. Assignment. This Non-Disclosure Agreement may not be assigned without the express written consent of all Parties hereto; provided, however, that any Party may assign this Non-Disclosure Agreement to an Affiliate of such Party without the consent of any other Party.

§14. Severability. Whenever possible, each provision of this Non-Disclosure Agreement shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision hereof shall be prohibited by, or determined to be invalid under, applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Non-Disclosure

Agreement. All obligations and rights of the Parties expressed herein shall be in addition to, and not in limitation of, those provided by applicable law.

§15. Entire Agreement. This Non-Disclosure Agreement constitutes the entire agreement among the Parties with respect to the subject matter hereof, and any and all previous representations or agreements with respect to such subject matter, either oral or written, are hereby annulled and superseded.

§16. Consents and Waivers. Any consent or waiver of compliance with any provision of this Non-Disclosure Agreement shall be effective only if in writing and signed by an authorized representative of the Party purported to be bound thereby, and then such consent or waiver shall be effective only in the specific instance and for the specific purpose for which it is given. No failure or delay by any Party in exercising any right, power or privilege under this Non-Disclosure Agreement shall operate as a waiver thereof, nor shall any single or partial waiver thereof preclude any other exercise of any other right, power or privilege hereunder.

§17. No Publicity. No Party shall (and each Party shall ensure that its Representatives and Affiliates do not) issue any press release or make any other public announcement regarding the existence of this Non-Disclosure Agreement or any discussions among the Parties regarding the Purpose without the prior written consent of all Parties.

§18 Notices. Where written notice is required by this Non-Disclosure Agreement, such notice shall be deemed to be given when delivered personally, mailed by certified mail, postage prepaid and return receipt requested, or by facsimile or electronic mail, as follows:

To National Grid:

Outdoor Lighting and Attachments
Attn: John Walter
144 Kensington Ave.
Buffalo NY 14214
Phone: (716) 831-7739
Email: John.Walter@nationalgrid.com

To CIMCON Lighting, Inc.

CIMCON Lighting, Inc.
Attn: Tod Riedel
234 Littleton Road, Westford MA, 01886
Phone: (978) 692-9868 ext. 235
Email: tod.riedel@cimconlighting.com


§19 Counterparts. This Non-Disclosure Agreement may be executed in one or more counterparts, each of which will be deemed to be an original copy of this Non-Disclosure Agreement and all of which, when taken together, will be deemed to constitute one and the same


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agreement. The exchange of copies of this Non-Disclosure Agreement and of signature pages by facsimile or other electronic transmission (including, without limitation, exchange of PDFs by electronic mail) shall constitute effective execution and delivery of this Non-Disclosure Agreement as to the Parties and may be used in lieu of the original Non-Disclosure Agreement for all purposes. Signatures of the Parties transmitted by facsimile or other electronic means shall be deemed to be their original signatures for all purposes. In proving this Non-Disclosure Agreement it shall not be necessary to produce or account for more than one such counterpart signed by the Party against whom enforcement is sought.

IN WITNESS WHEREOF, this Non-Disclosure Agreement has been executed by authorized representatives of the Parties as of the date first above written.

The Narragansett Electric Company d/b/a CIMCON Lighting, Inc.
National Grid

By: 
Name: Edward Lombardi
Title: Manager outdoor lighting
12/1/2015
ATTACHMENTS

By: 
Name: Todd Riedel
Title: VP, BUSINESS DEVELOPMENT