HEADQUARTERS: 914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

October 20, 2021

eGauge Systems LLC
1644 Conestoga St. Suite 2
Boulder, CO 80301

Dear David Mosberger,

Enclosed is the limited Meter Accuracy test report for testing of the eGauge Systems LLC, EG4215 meter, ECS20-200 CTs to the requirements of ANSI C12.1-2014 for Electric Meters, Code for Electricity Metering and ANSI C12.20-2015 for Electricity Meters – 0.1, 0.2 and 0.5 Accuracy Classes.

Thank you for using the services of Eurofins Electrical and Electronic Testing NA, Inc. If you have any questions regarding these results or if Eurofins Electrical and Electronic Testing NA, Inc. can be of further service to you, please feel free to contact me.

Sincerely yours,

Michelle Tawmging

Michelle Tawmging
Documentation Department
Eurofins Electrical and Electronic Testing NA, Inc.

Reference: (\eGauge Systems LLC\ TEL111846-ANSI Rev. 1)

ACCREDITED
TESTING CERT #0591.01

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Test Report

For the

eGauge Systems LLC
EG4215 meter, ECS20-200 CTs

Tested under

ANSI C12.1
ANSI C12.20

Report: TEL111846-ANSI Rev. 1

October 20, 2021

Prepared for:

eGauge Systems LLC
1644 Conestoga St. Suite 2
Boulder, CO 80301

Prepared by:
Eurofins Electrical and Electronic Testing NA, Inc.
914 W. Patapsco Ave
Baltimore, MD 21230

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Michael DeVilbiss
Meter Accuracy Lab

Michelle Tawmging
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be **within** the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested **is** capable of operation in accordance with the requirements of the customer supplied test plan.

Jim Reed
Meter Accuracy Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	May 28, 2021	Initial Issue.
1	October 20, 2021	Updated Model(s) Tested and Model(s) Covered throughout.

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List of Terms and Abbreviations

AC	**A**lternating **C**urrent
ACF	**A**ntenna **C**orrection **F**actor
Cal	**C**alibration
d	Measurement Distance
dB	**d**eci**B**els
dBµA	**d**eci**B**els above one **micro A**mp
dBµV	**d**eci**B**els above one **micro V**olt
dBµA/m	**d**eci**B**els above one **micro A**mp per **m**eter
dBµV/m	**d**eci**B**els above one **micro V**olt per **m**eter
DC	**D**irect **C**urrent
E	Electric Field
DSL	**D**igital **S**ubscriber **L**ine
ESD	**E**lectro**s**tatic **D**ischarge
EUT	**E**quipment **U**nder **T**est
f	Frequency
GRP	**G**round **R**eference **P**lane
H	Magnetic Field
HCP	**H**orizontal **C**oupling **P**lane
Hz	**H**ert**z**
IEC	**I**nternational **E**lectrotechnical **C**ommission
kHz	**kilo H**ert**z**
kPa	**kilo P**ascal
kV	**kilo V**olt
LISN	**L**ine **I**mpedance **S**tabilization **N**etwork
MHz	**M**ega **H**ert**z**
µH	**micro H**enry
µF	**micro**farad
µs	**micro s**econds
PRF	**P**ulse **R**epetition **F**requency
RF	**R**adio **F**requency
RMS	**R**oot-**M**ean-**S**quare
TWT	**T**raveling **W**ave **T**ube
V/m	**V**olts per **m**eter
VCP	**V**ertical **C**oupling **P**lane

1.0 Requirement Summary

An evaluation to determine compliance of the eGauge Systems LLC EG4215 meter, ECS20-200 CTs was performed on a sample of the equipment for the purpose of demonstrating compliance with ANSI 12.20-2015 for Electricity Meters - 0.2 and 0.5 Accuracy Classes.

5.5.4.1 - No Load - Test #1		Completed
5.5.4.1 - No Load - Test #1	SN 2101080002 - CL200 - 277V L-N - CT#s 0, 1, 2, 3, 4	Compliant
	SN 2101080004 - CL200 - 277V L-N - CT#s 5, 6, 7, 8, 9	Compliant
	SN 2101080005 - CL200 - 277V L-N - CT#s 10, 11, 12, 14, 15	Compliant
5.5.4.2 - Starting Load - Test #2		**Completed**
5.5.4.2 - Starting Load - Test #2	SN 2101080002 - CL200 - 277V L-N - CT#s 0, 1, 2, 3, 4	Compliant
	SN 2101080004 - CL200 - 277V L-N - CT#s 5, 6, 7, 8, 9	Compliant
	SN 2101080005 - CL200 - 277V L-N - CT#s 10, 11, 12, 14, 15	Compliant
5.5.4.3 - Load Performance - Test #3		**Completed**
5.5.4.3 - Load Performance - Test #3	SN 2101080002 - CL200 - 277V L-N - CT#s 0, 1, 2, 3, 4	Compliant
	SN 2101080004 - CL200 - 277V L-N - CT#s 5, 6, 7, 8, 9	Compliant
	SN 2101080005 - CL200 - 277V L-N - CT#s 10, 11, 12, 14, 15	Compliant
5.5.4.4 - Variation of Power Factor - Test #4		**Completed**
5.5.4.4 - Variation of Power Factor - Test #4	SN 2101080002 - CL200 - 277V L-N - CT#s 0, 1, 2, 3, 4	Compliant
	SN 2101080004 - CL200 - 277V L-N - CT#s 5, 6, 7, 8, 9	Compliant
	SN 2101080005 - CL200 - 277V L-N - CT#s 10, 11, 12, 14, 15	Compliant
5.5.4.6 - Variation of Frequency - Test #6		**Completed**
5.5.4.6 - Variation of Frequency - Test #6	SN 2101080002 - CL200 - 277V L-N - CT#s 0, 1, 2, 3, 4	Compliant
	SN 2101080004 - CL200 - 277V L-N - CT#s 5, 6, 7, 8, 9	Compliant
	SN 2101080005 - CL200 - 277V L-N - CT#s 10, 11, 12, 14, 15	Compliant
5.5.4.11 - Effect of Internal Heating - Test #11		**Completed**
5.5.4.11 - Effect of Internal Heating - Test #11	SN 2101080002 - CL200 - 277V L-N - CT#s 0, 1, 2, 3, 4	Compliant
	SN 2101080004 - CL200 - 277V L-N - CT#s 5, 6, 7, 8, 9	Compliant
	SN 2101080005 - CL200 - 277V L-N - CT#s 10, 11, 12, 14, 15	Compliant
5.5.4.13 - Stability of Performance - Test #13		**Completed**
5.5.4.13 - Stability of Performance - Test #13	SN 2101080002 - CL200 - 277V L-N - CT#s 0, 1, 2, 3, 4	Compliant
	SN 2101080004 - CL200 - 277V L-N - CT#s 5, 6, 7, 8, 9	Compliant
	SN 2101080005 - CL200 - 277V L-N - CT#s 10, 11, 12, 14, 15	Compliant
5.5.5.6 - Variation of Ambient Temperature - Test #19		**Completed**
5.5.5.6 - Variation of Ambient Temperature - Test #19	SN 2101080002 - CL200 - 277V L-N - CT#s 0, 1, 2, 3, 4	Compliant
	SN 2101080004 - CL200 - 277V L-N - CT#s 5, 6, 7, 8, 9	Compliant
	SN 2101080005 - CL200 - 277V L-N - CT#s 10, 11, 12, 14, 15	Compliant

Table 1: Summary of ANSI C12.1-2014 and ANSI C12.20-2015 Test Results

2.0 Equipment Configuration

2.1 Overview

The purpose of this series of tests was to verify compliance of the eGauge Systems LLC EG4215 meter, ECS20-200 CTs (referred to as EUT hereafter) with the limits of ANSI C12.1-2014 for Electric Meters, Code for Electricity Metering and ANSI C12.20-2015 for Electricity Meters - 0.2 and 0.5 Accuracy Classes.

Model(s) Tested:	EG4215 meter, ECS20-200 CTs	
Model(s) Covered:	Meter models EG4000 through EG4999 (including EG4015, EG4030, EG4115, EG4130, EG4215, EG4230), ECS20-200 CTs	
EUT Specifications:	Class:	See Equipment Configuration Table
Analysis:	The results obtained relate only to the item(s) tested.	
Ambient Lab Test Conditions:	Temperature:	23° C±2°C
	Relative Humidity:	30-60%
	Atmospheric Pressure:	860-1060 mbar
Evaluated by:	Michael DeVilbiss	

2.2 Test Site

All testing was performed at Eurofins Electrical and Electronic Testing NA, Inc., 914 West Patapsco Ave., Baltimore MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

2.3 Description of Test Sample

The Equipment Under Test (EUT) is an EG4215 meter, ECS20-200 CTs. The device is an electric energy meter with built-in data-logging and networking capabilities. Commonly, the device is used to monitor circuit-level electricity consumption at a site and/or electricity produced by renewable energy systems. More generally, the meter can be used to track production/consumption on up to 30 different circuits.

2.4 Equipment Configuration

All equipment incorporated as part of the EUT is included in the following list.

Distribution Circuit Configuration:(1-Phase 2-Wire;1-Phase 3-Wire;3-Wire Network;3-Wire 3-Phase Delta;4-Wire 3-Phase Delta:4-Wire 3-Phase Wye)
Voltage: (L-N and/or L-L voltages per configuration)
Test Amps: Recommended TA points per CL - CL2: 0.25; CL10: 2.5; CL20: 2.5; CL100: 15; CL200: 30; CL320: 50

Meter Form	Distribution Circuit Configuration	Voltage L-N	Voltage L-L	Current Class	Test Amps	Accuracy Class	Model/ Part Number	Serial Number	Firmware Revision	External CT or Sensor
	4-Wire 3-Phase	277	480	200	30	.5	EG4215	2101080002	4.1.7beta4	5x ECS20-200
	4-Wire 3-Phase	277	480	200	30	.5	EG4215	2101080004	4.1.7beta4	5x ECS20-200
	4-Wire 3-Phase	277	480	200	30	.5	EG4215	2101080005	4.1.7beta4	5x ECS20-200

Table 2: Equipment Configuration

2.5 Support Equipment

Support equipment necessary for the operation and testing of the EUT is included in the following list.

Name	Manufacturer	Model No.	Serial No.	Calibration Data
Laptop	ASUS	C100P	05NLCX047015209	-
Ethernet dongle	Apple	A1277	825-7579-A	-
Ethernet switch	Netgear	FS105	1D52423U52CA3	-
Power supply	Netgear	MU08A9075100-A1	-	-
Power supply	ASUS	AD2055320	-	-
Ethernet cables	-	-	-	-

Table 3: Support Equipment

2.6 Wireless Modules

Manufacturer	Model No.	Revision No.	FCC ID No.
Microchip Technology Inc	ATWILC1000-MR110UB	-	2ADHKATWILC1000U
Microchip Technology Inc	ATWILC1000-MR110UB	-	2ADHKATWILC1000U

Table 4: Wireless Modules

2.7 Isolating Paths

Voltage Line 1 & Current Circuit A to Earth Ground
Voltage Line 2 & Current Circuit B to Earth Ground
Voltage Line 3 & Current Circuit C to Earth Ground
Neutral to Earth Ground
Current Circuit A to Neutral
Current Circuit B to Neutral
Current Circuit C to Neutral
Current Circuit A to Current Circuit B
Current Circuit A to Current Circuit C
Current Circuit B to Current Circuit C
Voltage Line 1 & Current Circuit A to Neutral
Voltage Line 2 & Current Circuit B to Neutral
Voltage Line 3 & Current Circuit C to Neutral
Voltage Line 1 & Current Circuit A to Voltage Line 2 & Current Circuit B
Voltage Line 1 & Current Circuit A to Voltage Line 3 & Current Circuit C
Voltage Line 2 & Current Circuit B to Voltage Line 3 & Current Circuit C

Table 5: Isolating Paths

2.8 Mode of Operation

During normal operation, the EUT's LCD should show a heartbeat symbol in the upper-left corner that flashes once per second. The display should also cycle through the configured registers at about 10 seconds per register. The EUT's web server should be accessible via its IP address. A blank or frozen LCD would indicate a failure.

2.9 Method of Monitoring EUT Operation

The metering web page at http://IPADDR/meter.html updates once a second if the meter, web server, and communication operates correct and provides a convenient way to track the accumulated energy for the configured ports.\

2.10 Modifications

2.10.1 Modifications to EUT

No Modifications were made to the EUT.

2.10.2 Modifications to Test Standard

No Modifications were made to the test standard.

2.11 Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to eGauge Systems LLC upon completion of testing.