



June 2, 2015

Florida Building Commission
Building Codes and Standards Office
2555 Shumard Oak Blvd
Tallahassee, Florida 32399-2100

RE: Submission of EnergyGauge Summit 5.10 for approval for the 5th edition Florida Energy Code for Commercial Buildings

The Florida Solar Energy Center (FSEC) is pleased to submit EnergyGauge Summit 5.10 for approval for the 5th edition Florida Energy Code for Commercial Buildings.

Certification

To the best of our knowledge, judgement and interpretation, we certify that the software submitted for approval meets the requirements to demonstrate compliance of the 2014 5th edition Florida Energy Code for commercial buildings and the procedures of the “Energy Simulation Tool Approval Technical Assistance Manual, TAM-2014-1.0”.

Disclaimer

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Contents of submission:

I. Had copy of this letter

Fully working two copies of the EnergyGauge Summit 5.10 Software are included in the accompanying CD.

II. Application Checklist:

1. The cover sheet “Request for Approval” shown in Appendix-A.

Certified cover sheet that shows the compliance methods has met all the requirements. The cover sheet is appended at the end of this letter.

2. Computer Run Report

EnergyGauge Summit 5.10 software compliance output report forms per Appendix-C of the 5th edition TAM is included in the accompanying CD.

3. Compliance Supplement and User's Manual

The EnergyGauge Summit 5.10 software user's manual and executable program are included in the accompanying CD.



4. Performance Method Test Results Spreadsheet

performance methods code compliance calculations software evaluation were performed using the six prototype buildings A1, A3, A20, B1, C1 and D7. The required performance method compliance parameters were populated in the evaluation spreadsheet "CommercialPerformanceMethodsResults.xls". This summary spreadsheet is provided for each prototype building and is placed under the "Verification" sub-directory in the accompanying CD. And each spreadsheet file was named by concatenating the prototype building name and "Performance".

5. ASHRAE Standard 140 Test

The EnergyGauge Summit 5.10 software test for ASHRAE Standard 140 has been performed and the report is included in the accompanying CD provided. File named "SP140Report.pdf" in the CD is the SP140-2007 report.

6. Prescriptive Method Test Results Spreadsheet

The prescriptive code compliance calculation methods software evaluations were conducted for FEC Prescriptive and ASHRAE Prescriptive methods using the two commercial prototype buildings A1 and C1. The commercial prescriptive code compliance parameters were populated in the evaluation spreadsheet "CommercialPrescriptiveMethodsResults.xls". This summary spreadsheets are provided for A1 and C1 prototype buildings and are placed under the "Verification" sub-directory in the accompanying CD. The spreadsheet files were named by concatenating the prototype building name and "Prescriptive".

7. Envelope Trade-Off Option Results Spreadsheet

Not seeking approval of this code compliance method for this submission.

8. A letter describing any differences between the expected results or any other requirements listed in this document and their software

Not applicable.

III. Two Copies of the CD whose contents are:

- a. File named "ApprovalRequestLetter.pdf": is this letter
- b. The "Application Checklist" items described in part II.
- c. Directory named "EnergyGaugeSummit": contains the software package for EnergyGauge Summit 5.10.
- d. The directory "SP140" contains the SP140 validation calculation input, output, result and weather files subdirectories:
 1. Directory named "InputFiles": contains all the DOE2.1E input files used for the SP140-2007 test sets.
 2. Directory named "OutputFiles": contains all the DOE2.1E output files that were obtained by running the input files in the "InputFiles" directory using the EnergyGauge Summit 5.10 Software.
 3. Directory named "WeatherFiles": contains all the weather files used for the SP140-2007 test sets.
 4. Directory named "Results": contains all the results in the spreadsheet form as described in Section 4 under item 2, including COMNET Acceptance Range Results.
- e. The directory "Verification" contains the EnergyGauge Summit 5.10 software evaluation inputs, outputs, and results files. Each verification prototype building has its own folder named: *Prototype-A1*, *Prototype-A3*, *Prototype-A20*, *Prototype-B1*, *Prototype-C1*, and *Prototype-D7*. The DOE2.1E input file names are labeled by concatenating the prototype building names A1, A3, A20, B1, C1, and D7, and "CZ1" and "CZ2" for climate zones 1A and 2A. For example the DOE2.1E input files for prototype building A1, for climate zone 1A and 2A are: "A1CZ1.EGC" and "A1CZ2.EGC", respectively. The reference input files generated by the software are named by appending "ASHRAEReference" and "IECCReference" to the DOE2.1E input file names for ASHRAE and IECC compliance methods. For example the reference input files generated by the software for prototype building A1 and climate zone 1A are named as "A1CZ1ASHRAEReference.EGC" and "A1CZ1IECCReference.EGC". The compliance report files generated by the Software are named by appending "PerformanceASHRAE" and "PerformanceIECC" to the input file names for ASHRAE and IECC performance compliance methods, and "PrescriptiveASHRAE" and "PrescriptiveIECC" for ASHRAE and IECC Prescriptive compliance methods. For example,

the compliance report output files for prototype building A1, for prescriptive methods and climate zone 1A are named as “**A1CZ1PrescriptiveASHRAE.pdf**” and “**A1CZ1PrescriptiveIECC.pdf**”. The verification results summary are provided in the spreadsheet file named by appending “Prescriptive” and “Performance” to prototype building names. For example, the verification results summary file names for prototype building A1 are “**A1Prescriptive.xlsm**” and “**A1Performance.xlsm**”. The inputs, outputs and verification results files for the six prototype buildings are summarized in Table 1.

Table 1 Inputs, Outputs and Verification results file names for each test cases

Test Cases	File Names	Description
<i>Prototype-A1</i>	A1CZ1.EGC A1CZ2.EGC	DOE2.1E input files for software verification for climate zones 1A and 2A.
	A1CZ1ASHRAEReference.EGC A1CZ1ASHRAEReference.EGC	Reference input files generated for ASHRAE method for climate zones 1A and 2A.
	A1CZ1IECCReference.EGC A1CZ2IECCReference.EGC	Reference input files generated for IECC method for climate zones 1A and 2A.
	A1CZ1PerformanceASHRAE.pdf A1CZ2PerformanceASHRAE.pdf	ASHRAE Performance compliance method output files generated for climate zones 1A and 2A.
	A1CZ1PerformanceIECC.pdf A1CZ2PerformanceIECC.pdf	IECC Performance compliance method output files generated for climate zones 1A and 2A.
	A1CZ1PrescriptiveASHRAE.pdf A1CZ2PrescriptiveASHRAE.pdf	ASHRAE Prescriptive compliance method output files generated for climate zones 1A and 2A.
	A1CZ1PrescriptiveIECC.pdf A1CZ2PrescriptiveIECC.pdf	IECC Prescriptive compliance method output files generated for climate zones 1A and 2A.
	A1Prescriptive.xlsm	Verification results summary for prescriptive methods for climate zones 1A and 2A
	A1Performance.xlsm	Verification results summary for performance methods for climate zones 1A and 2A.
<i>Prototype-A3</i>	A3CZ1.EGC A3CZ2.EGC	DOE2.1E input files for software verification for climate zones 1A and 2A.
	A3CZ1ASHRAEReference.EGC A3CZ1ASHRAEReference.EGC	Reference input files generated for ASHRAE method for climate zones 1A and 2A.
	A3CZ1IECCReference.EGC A3CZ2IECCReference.EGC	Reference input files generated for IECC method for climate zones 1A and 2A.
	A3CZ1PerformanceASHRAE.pdf A3CZ2PerformanceASHRAE.pdf	ASHRAE Performance compliance method output files generated for climate zones 1A and 2A.
	A3CZ1PerformanceIECC.pdf A3CZ2PerformanceIECC.pdf	IECC Performance compliance method output files generated for climate zones 1A and 2A.
	A3Performance.xlsm	Verification results for performance methods for climate zones 1A and 2A
<i>Prototype-A20</i>	A20CZ1.EGC A20CZ2.EGC	DOE2.1E input files for software verification for climate zones 1A and 2A.
	A20CZ1ASHRAEReference.EGC A20CZ1ASHRAEReference.EGC	Reference input files generated for ASHRAE method for climate zones 1A and 2A.
	A20CZ1IECCReference.EGC A20CZ2IECCReference.EGC	Reference input files generated for IECC method for climate zones 1A and 2A.
	A20CZ1PerformanceASHRAE.pdf A20CZ2PerformanceASHRAE.pdf	ASHRAE Performance compliance method output files generated for climate zones 1A and 2A.
	A20CZ1PerformanceIECC.pdf A20CZ2PerformanceIECC.pdf	IECC Performance compliance method output files generated for climate zones 1A and 2A.
		A20Performance.xlsm

Table 1 Inputs, Outputs and Verification results file names for each test cases (Continued)

Test Cases	File Names	Description
<i>Prototype-B1 Retail</i>	B1CZ1Ret.EGC B1CZ2Ret.EGC	DOE2.1E input files for software verification for climate zones 1A and 2A.
	B1CZ1RetASHRAEReference.EGC B1CZ1RetASHRAEReference.EGC	Reference input files generated for ASHRAE method for climate zones 1A and 2A.
	B1CZ1RetIECCReference.EGC B1CZ2RetIECCReference.EGC	Reference input files generated for IECC method for climate zones 1A and 2A.
	B1CZ1RetPerformanceASHRAE.pdf B1CZ2RetPerformanceASHRAE.pdf	ASHRAE Performance compliance method output file generated for climate zones 1A and 2A.
	B1CZ1RetPerformanceIECC.pdf B1CZ2RetPerformanceIECC.pdf	IECC Performance compliance method output file generated for climate zones 1A and 2A.
	B1CZ1RetPrescriptiveASHRAE.pdf B1CZ2RetPrescriptiveASHRAE.pdf	ASHRAE Prescriptive compliance method output files generated for climate zones 1A and 2A.
	B1CZ1RetPrescriptiveIECC.pdf B1CZ2RetPrescriptiveIECC.pdf	IECC Prescriptive compliance method output files generated for climate zones 1A and 2A.
	B1Prescriptive.xlsm	Verification results summary for prescriptive methods for climate zones 1A and 2A
	B1Performance.xlsm	Verification results summary for performance methods for climate zones 1A and 2A.
<i>Prototype-B1 Supermarket</i>	B1CZ1Super.EGC B1CZ2Super.EGC	DOE2.1E input files for software verification for climate zones 1A and 2A.
	B1CZ1SuperASHRAEReference.EGC B1CZ1SuperASHRAEReference.EGC	Reference input files generated for ASHRAE method for climate zones 1A and 2A.
	B1CZ1SuperIECCReference.EGC B1CZ2SuperIECCReference.EGC	Reference input files generated for IECC method for climate zones 1A and 2A.
	B1CZ1SuperPerformanceASHRAE.pdf B1CZ2SuperPerformanceASHRAE.pdf	ASHRAE Performance compliance method output files generated for climate zones 1A and 2A.
	B1CZ1SuperPerformanceIECC.pdf B1CZ2SuperPerformanceIECC.pdf	IECC Performance compliance method output files generated for climate zones 1A and 2A.
	B1CZ1SuperPrescriptiveASHRAE.pdf B1CZ2SuperPrescriptiveASHRAE.pdf	ASHRAE Prescriptive compliance method output files generated for climate zones 1A and 2A.
	B1CZ1SuperPrescriptiveIECC.pdf B1CZ2SuperPrescriptiveIECC.pdf	IECC Prescriptive compliance method output files generated for climate zones 1A and 2A.
	B1Prescriptive.xlsm	Verification results summary for prescriptive methods for climate zones 1A and 2A
	B1Performance.xlsm	Verification results summary for performance methods for climate zones 1A and 2A.

Table 1 Inputs, Outputs and Verification results file names for each test cases (Continued)

Test Cases	File Names	Description
<i>Protoype-C1 Manufacturing</i>	C1CZ1Man.EGC C1CZ2Man.EGC	DOE2.1E input files for software verification for climate zones 1A and 2A.
	C1CZ1ManASHRAEReference.EGC C1CZ1ManASHRAEReference.EGC	Reference input files generated for ASHRAE method for climate zones 1A and 2A.
	C1CZ1ManIECCReference.EGC C1CZ2ManIECCReference.EGC	Reference input files generated for IECC method for climate zones 1A and 2A.
	C1CZ1ManPerformanceASHRAE.pdf C1CZ2ManPerformanceASHRAE.pdf	ASHRAE Performance compliance method output file generated for climate zones 1A and 2A.
	C1CZ1ManPerformanceIECC.pdf C1CZ2ManPerformanceIECC.pdf	IECC Performance compliance method output file generated for climate zones 1A and 2A.
	C1CZ1ManPrescriptiveASHRAE.pdf C1CZ2ManPrescriptiveASHRAE.pdf	ASHRAE Prescriptive compliance method output files generated for climate zones 1A and 2A.
	C1CZ1ManPrescriptiveIECC.pdf C1CZ2ManPrescriptiveIECC.pdf	IECC Prescriptive compliance method output files generated for climate zones 1A and 2A.
	C1Prescriptive.xlsm	Verification results summary for prescriptive methods for climate zones 1A and 2A
	C1Performance.xlsm	Verification results summary for performance methods for climate zones 1A and 2A.
<i>Protoype-C1 Warehouse</i>	C1CZ1Ware.EGC C1CZ2Ware.EGC	DOE2.1E input files for software verification for climate zones 1A and 2A.
	C1CZ1WareASHRAEReference.EGC C1CZ1WareASHRAEReference.EGC	Reference input files generated for ASHRAE method for climate zones 1A and 2A.
	C1CZ1WareIECCReference.EGC C1CZ2WareIECCReference.EGC	Reference input files generated for IECC method for climate zones 1A and 2A.
	C1CZ1WarePerformanceASHRAE.pdf C1CZ2WarePerformanceASHRAE.pdf	ASHRAE Performance compliance method output files generated for climate zones 1A and 2A.
	C1CZ1WarePerformanceIECC.pdf C1CZ2WarePerformanceIECC.pdf	IECC Performance compliance method output files generated for climate zones 1A and 2A.
	C1CZ1WarePrescriptiveASHRAE.pdf C1CZ2WarePrescriptiveASHRAE.pdf	ASHRAE Prescriptive compliance method output files generated for climate zones 1A and 2A.
	C1CZ1WarePrescriptiveIECC.pdf C1CZ2WarePrescriptiveIECC.pdf	IECC Prescriptive compliance method output files generated for climate zones 1A and 2A.
	C1Prescriptive.xlsm	Verification results summary for prescriptive methods for climate zones 1A and 2A
	C1Performance.xlsm	Verification results summary for performance methods for climate zones 1A and 2A.

Table 1 Inputs, Outputs and Verification results file names for each test cases (Continued)

Test Cases	File Names	Description
<i>Prototype-D7</i>	D7CZ1.EGC D7CZ2.EGC	DOE2.1E input files for software verification for climate zones 1A and 2A.
	D7CZ1ASHRAEReference.EGC D7CZ1ASHRAEReference.EGC	Reference input files generated for ASHRAE method for climate zones 1A and 2A.
	D7CZ1IECCReference.EGC D7CZ2IECCReference.EGC	Reference input files generated for IECC method for climate zones 1A and 2A.
	D7CZ1PerformanceASHRAE.pdf D7CZ2PerformanceASHRAE.pdf	ASHRAE Performance compliance method output files generated for climate zones 1A and 2A.
	D7CZ1PerformancelECC.pdf D7CZ2PerformancelECC.pdf	IECC Performance compliance method output files generated for climate zones 1A and 2A.
	D7CZ1PrescriptiveASHRAE.pdf D7CZ2PrescriptiveASHRAE.pdf	ASHRAE Prescriptive compliance method output files generated for climate zones 1A and 2A.
	D7CZ1PrescriptiveIECC.pdf D7CZ2PrescriptiveIECC.pdf	IECC Prescriptive compliance method output files generated for climate zones 1A and 2A.
	D7Performance.xlsm	Verification results summary for performance methods for climate zones 1A and 2A.

Appendix A:
**Cover sheet for request for approval by the Florida Building Commission as a
Compliance Software tool**


Date of Submittal: **June 2, 2015**
Software Company: **Florida Solar Energy Center**
Contact Person: **Muthusamy Swami**
Contact email: **swami@fsec.ucf.edu**
Contact Phone: **321-638-1410**
Name of Product (If marketed under different editions or names list all that apply):
EnergyGauge Summit
Version Number: **5.10**

Code Compliance Methods this software calculates:

Commercial Energy Efficiency Code Compliance

- FEC Prescriptive Method
- FEC Total Building Performance Method
- ASHRAE Prescriptive Method
- ASHRAE Envelope Trade-off Option Method (this method is not offered in the software)
- ASHRAE Energy Cost Budget Method

As an official of the software company named above, I certify the software listed meets the requirements of the Florida Building Code, Energy Conservation 5th Ed. (2014) for the methods indicated and that this submittal includes the required documentation as given in the Energy Simulation Tool Approval – Technical Assistance Manual or as requested by the Florida Building Commission:



Signature

June 2, 2015
Date

Muthusamy Swami
Printed Name

Program Director
Title