



January 19, 2016

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

RE: Submission of EnergyGauge Summit 5.20 for approval for the 5<sup>th</sup> edition Florida Energy Code for Commercial Buildings

The Florida Solar Energy Center (FSEC) is pleased to submit EnergyGauge Summit 5.20 for approval for the 5<sup>th</sup> 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 5<sup>th</sup> edition Florida Energy Code for commercial buildings and the procedures of the “Energy Simulation Tool Approval Technical Assistance Manual, TAM-2014-1.0”.

#### Disclaimer

THE SOFTWARE IS PROVIDED “AS IS”, WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS OR THE UNIVERSITY OF CENTRAL FLORIDA BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OF OR OTHER DEALINGS IN THE SOFTWARE.

#### Contents of submission:

**I. This letter**

*Fully working EnergyGauge Summit 5.20 Software.*

**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 5.20 software compliance output report forms per Appendix-C of the 5<sup>th</sup> edition TAM..*

**3. Compliance Supplement and User's Manual**

The *EnergyGauge Summit 5.20 software user's manual and executable program*.

#### 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. This summary spreadsheet is provide for each prototype building and is placed under the "Verification" sub-directory. And each spreadsheet file was named by concatenating the prototype building name and "Performance".*

#### 5. ASHRAE Standard 140 Test

*The EnergyGauge Summit 5.20 software test for ASHRAE Standard 140 has been performed and the report is included. File named "SP140Report.pdf" 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. The summary spreadsheets are provided for A1 and C1 prototype buildings and are placed under the "Verification" sub-directory. 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. Submissions are:

- a. File named "**ApprovalRequestLetter.pdf**": is this letter
- b. The "**Application Checklist**" items described in part II.
- c. Software package for EnergyGauge Summit 5.20, called EGS2015Fil520.exe
- 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 5.20 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 5.20 software evaluation inputs and results. Each verification prototype building has its own folder named: *Prototype-A1, Prototype-A3, Prototype-A20, Prototype-B1, Prototype-C1, and Prototype-D7*. The 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 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 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 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, 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 case

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.
	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.
	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.
	A20Performance.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 case (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.
	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.
	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)

<b>Test Cases</b>	<b>File Names</b>	<b>Description</b>
<i>Prototype-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.
	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>Prototype-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.
	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)

<b>Test Cases</b>	<b>File Names</b>	<b>Description</b>
<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.
	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: **January 19, 2016**  
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: **5.20**

**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 5<sup>th</sup> 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

January 19, 2016  
Date

Muthusamy Swami  
Printed Name

Program Director  
Title

Fixes in compliance software EnergyGauge Summit version 5.20

No	Description	Comment
1	ASHRAE Mandatory requirements Categorized based on stage of compliance	Clarifies when and where mandatory requirement are to be complied with
2	FBC (IECC 2012) Mandatory requirements Categorized based on stage of compliance	Clarifies when and where mandatory requirement are to be complied with
3	Additional Efficiency Performance Options for HVAC were corrected.	Transposed columns caused incorrect values to display
4	Crash when no south window existed was corrected	
5	External lighting compliance discrepancy between details report and front page summary was corrected	
6	Feature added to reset workspace data if corrupted	
7	Removed reference to incorrect form numbers on reports	
8	Discrepancy between SEER and EER for systems less than 65000 Btu/h was fixed	
9	WWR and Skylight percentage now calculated on the entire building rather than zone by zone	Makes both FBC and ASHRAE Consistent
10	Crash due to incorrect Skylight percent value for Multifamily building fixed	