Eon Temperature Control System - Den Test Procedure

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Revision History

Authors	Description of Change	Sections	Rev	Date
Erine Estrella Mohamed Jaafar Devontae Reid Sean Wulwick	Initial release	All	О	4-10-18
Mohamed Jaafar Devontae Reid	Started working on Test Case 1	Test Case	I	4-15-18
Mohamed Jaafar	Worked on Test Cases 2 and 4	Test Case 2 Test Case 4	II	4-17-18
Mohamed Jaafar	Updated Test Cases 2 and 4	Test Case 2 Test Case 4	III	4-26-18
Mohamed Jaafar Devonate Reid	Worked on Test Case 3	Test Case 3	IV	5-1-18
Mohamed Jaafar	Finalized document	All	V	5-5-18

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1 Team Description

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2 Introduction

The following test procedure cases serve to ensure that requirements that were specified in the **Written Requirements** document are properly incorporated in the system. The test cases range from Basic
Functionality to Setting Up Calendar to Setting Temperature Based on City and finally, Setting User
Defined Temperature.

Note 1: In all four test cases, the first five steps and the last step are identical, as they serve to describe initiating and setting up the system, which is necessary to perform any type of testing.

Note 2: In regards to the <u>6. Maintain Temperature Threshold</u> section, which is described in the **Written Requirements** document, it is noted below that the room temperature never actually changes. Instead, the set point (temperature that is set by the user) slowly changes in order to reach that of the room temperature. This is because the project is solely a simulation and does not include a cooling/heating unit. This means that internal temperature will never actually change.

2.1 Identification

Requirement Document Tested:	Written Requirements document
Requirement Document Revision:	Revision III
Revision Release Date:	04-19-2018

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3 Test Procedures

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3.1 Test Case 1 - Basic Functionality

Description: This test validates the default settings and modes that are available to the user.

Precondition:

- 1) Power source available.
- 2) Internet connection available.
- 3) All equipment available.

Step Number	Action	System Response	Requirement Tested (if applicable)
1		Terminal windows is	
	Apply power to Raspberry Pi	displayed on Adafruit	
	Assembly.	Touchscreen	
2	Launch the GUI by entering	The GUI is displayed, with	RID-009
	interface.exe (the execution	the current temperature	
	command).	on the homepage.	
3	Establish the wifi connection from	Icon, indicating successful	RID-001
	the computer by configuring the	connection, is displayed.	
	network settings.		
4		System will indicate	
		successful fetching of	
	Wait for 30 seconds.	weather data via an icon.	
5		System displays the	RID-009
		current updated	
		temperature, along with	
		weather forecast.	
	Observe the display.	"Current Temp:"	
6			RID-008, RID-0010,
		Heater turns on.	RID-0011
		System reflects that input	
		by adjusting the set point,	
		gradually, until it reaches	
		the room temperature.	
		Note that room	
		temperature must not	
	Set the set point to be equal to	change in this case. (Refer	
	the current temperature minus	to Introduction for	
	the threshold minus 1.	additional information).	
	the threshold militas 1.	additional information).	

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7	Increase set point temperature by	Heater remains on.	
	1 degree.		
8	Increase set point temperature by 1 degree.	Heater remains on.	
9	Increase set point temperature by 1 degree.	Heater remains on.	
10	Increase set point temperature by 1 degree.	Heater shuts down.	RID-0011
11		Cooler turns on.	RID-008, RID0010, RID-012
		System reflects that input	
		by adjusting the set point,	
		gradually, until it reaches	
		the room temperature.	
		Note that room	
		temperature must not	
	Set the set point to be equal to	change in this case. (Refer	
	the current temperature plus the	to Introduction for	
	threshold plus 1.	additional information).	
12	Decrease set point temperature	Cooler remains on.	
12	by 1 degree.	Cooler remains on.	
13	Decrease set point temperature by 1 degree.	Cooler remains on.	
14	Decrease set point temperature by 1 degree.	Cooler remains on.	
15	Decrease set point temperature by 1 degree.	Cooler shuts down.	RID-0012
16		System remains on, connection to wifi is lost,	RID-0013
		along with all basic	
	Disable system.	functionality.	
17	Disable System.	Connection to wifi is	RID-0013
- '		retained, along with all	1112 0013
	Re-enable system.	basic functionality.	
18		System successfully shuts	
		down; power removed	
	Shutdown system by pressing	from Raspberry Pi	
	appropriate button on interface.	assembly.	
	app. spats satton on meenace		1

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3.2 Test Case 2 - Setting up Calendar

Description: This test ensures that the system is able to receive the temperature from the Yahoo Weather API and displays it to the user.

Precondition:

- 1) Power source available.
- 2) Internet connection available.
- 3) All equipment available.

Step Number	Action	System Response	Requirement Tested (if applicable)
1		Terminal windows is	
	Apply power to Raspberry Pi	displayed on Adafruit	
	Assembly.	Touchscreen	
2	Launch the GUI by entering	The GUI is displayed, with	RID-009
	interface.exe (the execution	the current temperature	
	command).	on the homepage.	
3	Establish the wifi connection from	Icon, indicating successful	RID-001
	the computer by configuring the	connection, is displayed.	
	network settings.		
4		System will indicate	
		successful fetching of	
	Wait for 30 seconds.	weather data via an icon.	
5		System displays the	RID-009
		current updated	
		temperature, along with	
		weather forecast.	
	Observe the display.	"Current Temp:"	
6		System displays the	RID-002
		calendar for the current	
	Launch the calendar	week	
7		System should ask user for	RID-003
		temperature and specific	
		time that they would like	
		to set this temperature	
	Press a date on the calendar	for???	

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8		Cooler or Heater turns on until target temperature is reached for the current temperature event	RID-005
	Tracks changes in time throughout day	Event should repeat weekly	
9		System should ask user	RID-004
		which option they would	
	Press date to allow user to modify	like to choose	
	temperature event	(insert,delete,or modify)	
10		System successfully shuts	
		down; power removed	
	Shutdown system by pressing	from Raspberry Pi	
	appropriate button on interface.	assembly.	

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3.3 Test Case 3 - Setting Temperature Based on City

Description: This test ensures that the system is able to receive the temperature from the Yahoo Weather API and displays it to the user.

Precondition:

- 1) Power source available.
- 2) Internet connection available.
- 3) All equipment available.

Step Number	Action	System Response	Requirement Tested (if applicable)
1	Apply power to Raspberry Pi Assembly.	Terminal windows is displayed on Adafruit Touchscreen	() []
2	Launch the GUI by entering interface.exe (the execution command).	The GUI is displayed, with the current temperature on the homepage.	RID-009
3	Establish the wifi connection from the computer by configuring the network settings.	Icon, indicating successful connection, is displayed.	RID-001
4	Wait for 30 seconds.	System will indicate successful fetching of weather data via an icon.	
5		System displays the current updated temperature, along with weather forecast.	RID-009
	Observe the display.	"Current Temp:"	
6	Press button that allows you to enter a city of choice to track.	System prompts for entry of location through city name or zip code.	RID-006
7	Enter a valid zip code (such as 92834, which identifies Fullerton, CA).	System successfully identifies information and indicate fetching of weather data for Fullerton via an icon.	RID-006
8	Track changes in temperature.	Cooler or Heater turns on.	

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9		System reflects that input by adjusting the set point, gradually, until it reaches the room temperature. Note that room temperature must not change in this case. (Refer to Introduction for additional information).	
10	Press button that allows you to enter a city of choice to track.	System prompts for entry of location through city name or zip code.	RID-006
11	Enter an invalid zip code (such as 0000, which is short by one number).	System fails to identify weather information and displays an error addressing the issue faced.	RID-007
12	Track potential changes in temperature.	No changes at all.	RID-007
13	Shutdown system by pressing appropriate button on interface.	System successfully shuts down; power removed from Raspberry Pi assembly.	

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3.4 Test Case 4 - Setting User Defined Temperature

Description: This will test the system's ability to take user input, activate the system, force a disable of the system and re-enable of the system. It will also leave the system in vacation mode and retake the user input to show that it will not be activated in vacation mode.

Precondition:

- 1) Power source available.
- 2) Internet connection available.
- 3) All equipment available.

Step Number	Action	System Response	Requirement Tested (if applicable)
1	Apply power to Raspberry Pi Assembly.	Apply power to Raspberry Pi Assembly.	
2	Launch the GUI by entering interface.exe (the execution command).	Launch the GUI by entering interface.exe (the execution command).	RID-009
3	Establish the wifi connection from the computer by configuring the network settings.	Icon, indicating successful connection, is displayed.	RID-001
4	Wait for 30 seconds.	System will indicate successful fetching of weather data via an icon.	
5	Observe the display.	System displays the current updated temperature, along with weather forecast.	RID-009
6	Press button that allows you to enter a user defined temperature.	"Current Temp:" The system should prompt for temperature entry by user.	RID-008
7		Heater turns on.	RID-008, RID-0010, RID-0011
	Set the set point to be equal to the current temperature minus the threshold minus 1.	System reflects that input by adjusting the set point, gradually, until it reaches the room temperature.	

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Note that room temperature must not change in this case. (Refer to Introduction for additional information) 8			1	1
Refer to Introduction for additional information Heater remains on.			Note that room temperature	
8 Increase set point temperature by 1 degree. 9 Increase set point temperature by 1 degree. 10 Increase set point temperature by 1 degree. 11 Increase set point temperature by 1 degree. 12 Cooler turns on. 12 Cooler turns on. 13 Set the set point temperature by 1 degree. 14 Decrease set point temperature by 1 degree. 15 Decrease set point temperature by 1 degree. 16 Decrease set point temperature by 1 degree. 17 Decrease set point temperature by 1 degree. 18 Decrease set point temperature by 1 degree. 19 AS HVAC is running, intentionally prevent additional information) 19 AS HVAC is running, intentionally prevent additional information) 19 AS HVAC is running, intentionally prevent additional information) 19 AS HVAC is running, intentionally prevent additional information) 19 AS HVAC is running, intentionally prevent additional information) 1			must not change in this case.	
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Press button that enters Vacation mode. 18 Set point temperature should incrementally reach that of the current temperature. Note that room temperature must not change in this case (Refer to Introduction for additional information) As HVAC is running, intentionally prevent automatically saved as 40 degrees (F). RID-0014 RID-0014 RID-0015 RID-015 RID-015 RID-016			_	
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Set point temperature should incrementally reach that of the current temperature. Note that room temperature must not change in this case (Refer to Introduction for additional information) As HVAC is running, intentionally prevent System should disable itself RID-016 RID-0014 RID-0014 RID-0014 RID-0015 RID-015 RID-015 RID-016			•	
incrementally reach that of the current temperature. Note that room temperature must not change in this case Observe change in (Refer to Introduction for additional information) As HVAC is running, intentionally prevent completely; system should RID-016	10	vacation mode.		DID 0014
Current temperature. Note that room temperature must not change in this case Observe change in (Refer to Introduction for additional information) As HVAC is running, intentionally prevent completely; system should RID-015 RID-016	18			KID-0014
Note that room temperature must not change in this case Observe change in temperature. Refer to Introduction for additional information) As HVAC is running, intentionally prevent System should disable itself completely; system should RID-016			-	
must not change in this case Observe change in temperature. Refer to Introduction for additional information) As HVAC is running, intentionally prevent System should disable itself completely; system should RID-015 RID-016			current temperature.	
must not change in this case Observe change in temperature. Refer to Introduction for additional information) As HVAC is running, intentionally prevent System should disable itself completely; system should RID-015 RID-016				
must not change in this case Observe change in temperature. As HVAC is running, intentionally prevent must not change in this case (Refer to Introduction for additional information) System should disable itself completely; system should RID-015 RID-016			Note that room temperature	
Observe change in temperature. (Refer to Introduction for additional information) 19 As HVAC is running, intentionally prevent (System should disable itself completely; system should RID-016			·	
temperature. additional information) 19 As HVAC is running, System should disable itself intentionally prevent completely; system should RID-016		Observe change in	_	
As HVAC is running, System should disable itself RID-015 completely; system should RID-016		_	1 *	
intentionally prevent completely; system should RID-016	10	·	,	DID 045
	19		· ·	
temperature from changing display an error message		Lintentionally prevent	L completely: system should	I KID-016
				12 020
with any input from user. description of the issue.		temperature from changing	display an error message	0.20

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20	Shutdown system by	System successfully shuts down;	
	pressing appropriate	power removed from Raspberry	
	button on interface.	Pi assembly.	

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4. Verification Cross Reference Matrix

Requirement Identifier	Where Tested
RID-0001	Γest 1: Basic Functionality
	Test 3: Setting Temperature Based on City
	Test 4: Setting User Defined Temperature
RID-0002	Test 2: Setting up Calendar
RID-0003	Test 2: Setting up Calendar
RID-0004	Test 2: Setting up Calendar
RID-0005	Test 2: Setting up Calendar
RID-0006	Test 3: Setting Temperature Based on City
RID-0007	Test 3: Setting Temperature Based on City
RID-0008	Test 1: Basic Functionality,
	Test 4: Setting User Defined Temperature
RID-0009	Test 1: Basic Functionality,
	Test 3: Setting Temperature Based on City
RID-0010	Γest 1: Basic Functionality,
	Test 4: Setting User Defined Temperature
RID-0011	Γest 1: Basic Functionality,
	Test 4: Setting User Defined Temperature
RID-0012	Γest 1: Basic Functionality
	Test 4: Setting User Defined Temperature
RID-0013	Test 4: Setting User Defined Temperature
RID-0014	Test 4: Setting User Defined Temperature
RID-0015	Test 4: Setting User Defined Temperature
RID-0016	Test 4: Setting User Defined Temperature

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