

Digital Home Use Case Model

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Introduction

This document is a supplement to the *Digital Home Software Requirements Specification*, Version 1.3, developed by the DigitalHomeOwner Division of HomeOwner Inc. It contains a Use Case Model that was developed as part of an analysis of the DigitalHome (DH) functional requirements. It includes a Use Case Diagram for the entire Digital Home system, along with several diagrams for specific parts of the system. For each use case there is a scenario description that describes how actors interact with the system to carry out the use case functionality.

DH Actors

The use case diagrams and use case scenarios depict actors that interact with the DigitalHome System. The following is a description of the DH Actors:

- General User – an actor who is able to use the DH system capabilities to monitor and control the environment in his/her home.
- Master User – a general user who has the ability to change the configuration of the DH System (e.g., add/delete users, change the default settings).
- DH Technician – a general user who is responsible for setting up and maintaining the configuration of a DH system.
- DH Database – a storage device that can be used to write or read user account information, monthly plan data, and default values.
- DH Gateway – a device which provides communication between all the DH environment devices (sensors and controllers) the DH System.
- Time – A virtual actor that provides a periodic input to the DH System of the date and the time of day.
- Sensors and Controllers – Thermostat, Humidistat, Power Switch, Contact Sensor, Light Alarm, Sound Alarm.

Digital Home Use Case Diagram

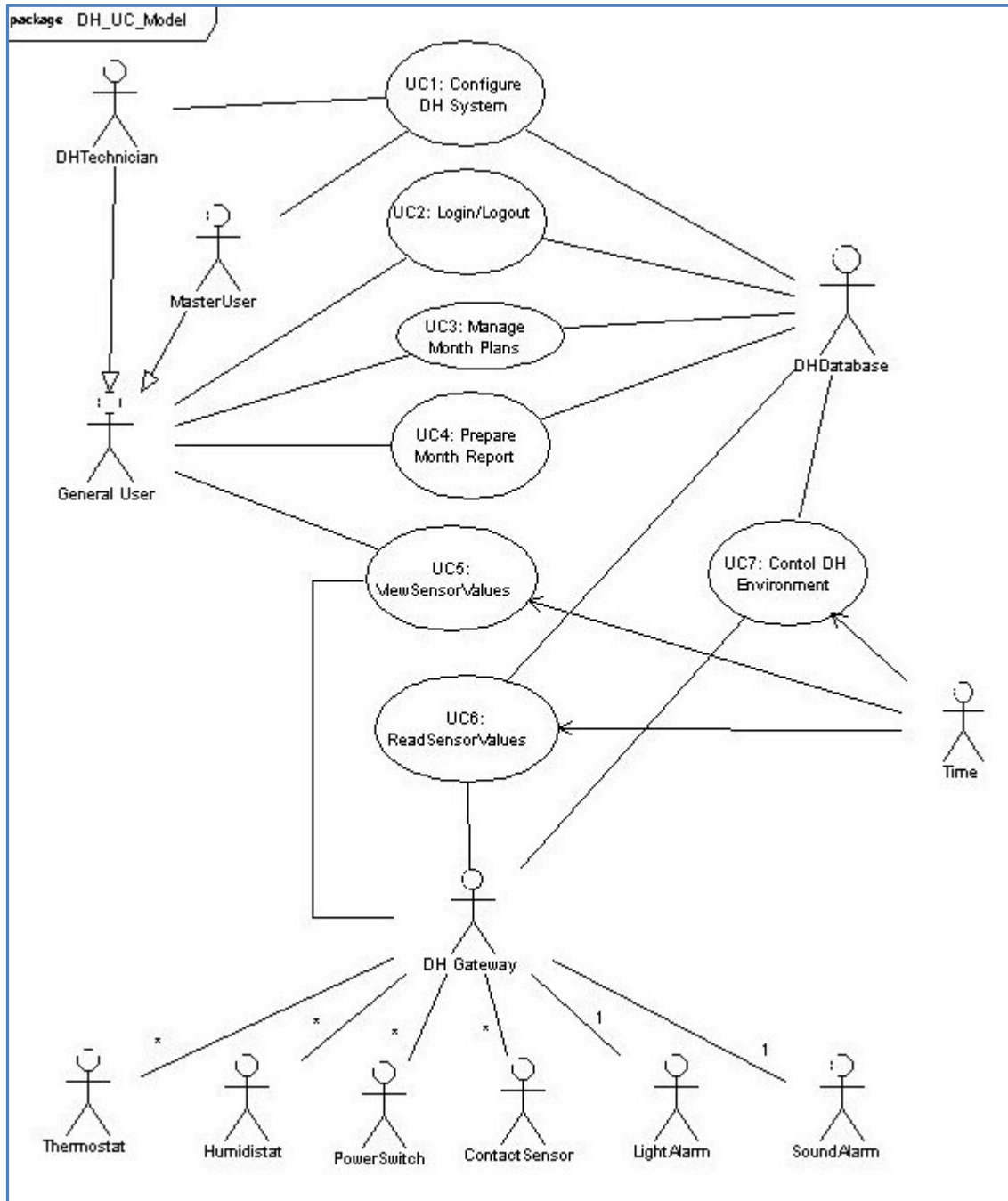


Figure 1: Digital Home Use Case Diagram

UC1: Configure DH System

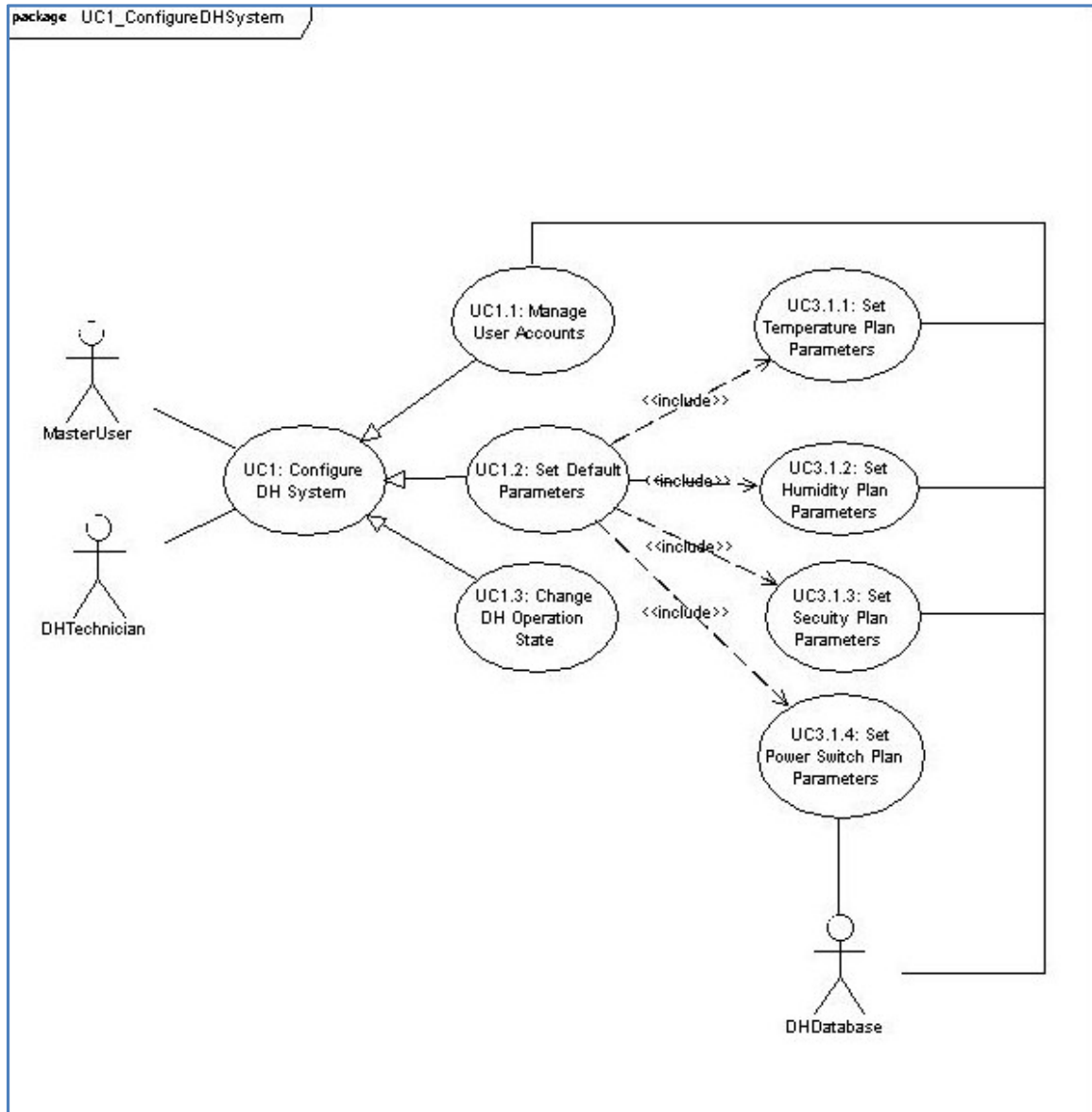


Figure 2: UC3 Configure DH System

Use Case ID: UC1

Use Case: Configure DH System

Goal: Configure the DH system, including establishing or deleting user accounts, setting the default values for system devices, and starting or stopping the operation of the DH system.

Primary Actors: DH Technician, Master User

Secondary Actor: DH Database

Pre:

2. The DH Technician or a Master User is logged into her/his DH account.
3. DH Main Page is displayed on the user display device.

Post:

1. DH Main Page is displayed on the user display device.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
1	Select Configuration System option	2	Display DH Configuration Page And "Which operation do you want to perform?": a. Add or delete a user account b. Set/Change Default Values c. Start/Stop DH System Operation d. Exit Configuration Page
3A	Select a.	4A	Invoke UC 1.1 Go to 2
3B	Select b.	4B	Invoke UC 1.2 Go to 2
3C	Select c.	4C	Invoke UC 1.3 Go to 2
3D	Select d.	4D	Continue
		5	Display DH Main Page

UC GUIs: DH Main Page, DH Configuration Page

Exceptions:

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)

Use Cases Utilized: UC-1.1, UC-1.2, UC-1.3

Notes and Issues: An account is set up for the DH Technician prior to initial system configuration. Such a setup is not part of the normal DH System operation. Master users and general users can be added by the DH Technician.

Use Case ID: UC1.1

Use Case: Manage User Accounts

Goal: Add or delete users to the DH System

Primary Actors: DH Technician, Master User

Secondary Actor: DH Database

Pre:

1. The DH Technician or a Master User is logged into her/his DH account.
2. DH Configuration Page is displayed on the user display device.

Post:

1. DH Configuration Page is displayed on the user display device.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
		1	Display "Which operation do you want to perform?" a. Add a user account b. Delete user account
2A	Select a.	3A	Display "Enter user name and password for new user account."
4A	Enter user name and password	5A	Establish account, writing record to DH Database
2B	Select b.	3B	Display "Enter user name for account to be deleted."
4B	Enter user name	5B	Delete account from DH database

UC GUIs: DH Configuration Page

Exceptions:

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Attempt to delete a user account that does not exist.
 - Response: Display an error message and allow re-entry of user information.
3. Attempt to add a user account for one that already exists.
 - Response: Display an error message and allow re-entry of user information.
4. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)

Use Cases Utilized: none.

Notes and Issues: It not possible to prevent all errors concerned with creation of user accounts – e.g., incorrect user name or unintended password.

Use Case ID: UC1.2

Use Case: Set Default Parameters

Goal: Set or change default parameters for DH devices.

Primary Actors: DH Technician, Master User

Secondary Actor: DH Database

Pre:

1. The DH Technician or a Master User is logged into her/his DH account.
2. DH Configuration Page is displayed on the user display device.

Post:

1. DH Configuration Page is displayed on the user display device.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
		1	Display "Enter the default set point temperature for all Thermostats."
2	Enter set point temperature.	3	Store the temperature set points in the DH database.
		4	Display "Enter the default set point humidity for all Humidistats."
5	Enter set point humidity.	6	Store the humidity set points in the DH database.
		7	Display "Enter the default setting for all of the contact sensors (ON/OFF)"
8	Enter On or OFF	9	Store the contact sensor setting in the DH database.
		10	Display "Select room for setting power switch defaults."
11	Select room	12	Display "Select power switch(es)" and "For power switches not selected, they will be set to OFF."
13	Select power switch(es)	14	Store the power switch settings, for the selected room, in the DH database.
		15	Display "For rooms not selected, all power switches will be set to OFF. Other rooms? Yes/No"
16	Enter "Yes"	17	Go to Step 10
18	Enter "No"	19	Display DH Configuration Page

UC GUIs: DH Configuration Page

Exceptions:

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)

Use Cases Utilized: none.

Use Case ID: UC1.3

Use Case: Change DH Operation State

Goal: Start or Stop DH System Operation

Primary Actors: DH Technician, Master User

Secondary Actor: DH Database

Pre:

1. The DH Technician or a Master User is logged into her/his DH account.
2. DH Configuration Page is displayed on the user display device.

Post:

1. DH Configuration Page is displayed on the user display device.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
		1	Get state of DH System operation from DH Database.
		2	Display "On or Off" for state of DH System operation. Display "Change the state of DH operation (Y/N)?"
3	Enter Y		Store new state of DH System in the DH database
4	Enter N	5	Display DH Configuration Page

UC GUIs: DH Configuration Page

Exceptions:

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)

Use Cases Utilized: none.

UC2: Login/Logout

Use Case ID: UC2

Use Case: Login/Logout

Goal: A user can Login or Logout of the DH system. The user may also change his/he password.

Primary Actors: General User

Secondary Actor: DH Database

Pre:

1. Actor has a user account.
2. DH Main Page is displayed.

Post:

1. Login or Logout and/or password change is successful.
2. DH Main Page is displayed.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
1	Select login/logout option	2	Display Login/Logout Page and "What do you want to do?" a. Login b. Logout
3A	Enter a.	4A	Display "Enter username and password."
5A	Enter username and password	6A	Check username and password in DH database.
		7A	If incorrect, print error message and go to step 4A. If correct, print Login confirmation message and got next step
		8A	Display DH Min Page
3B	Enter b.	4B	Print Logout confirmation message
		5B	Display DH Min Page

UC GUIs: DH Main Page, Login/Logout Page

Exceptions:

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)
3. A user, who is already logged in, tries to log in.
 - Response: Display an error message.
4. A user, who is logged out, tries to log out.
 - Response: Display an error message.
5. A user enters nonexistent username/password combination 5 consecutive times.
 - Response: Display error message and timeout user for 10 minutes.

Use Cases Utilized: none.

Notes and Issues: If a user is not logged in, the only option she/he has is to choose the Login capability.

UC3: Manage Month Plan

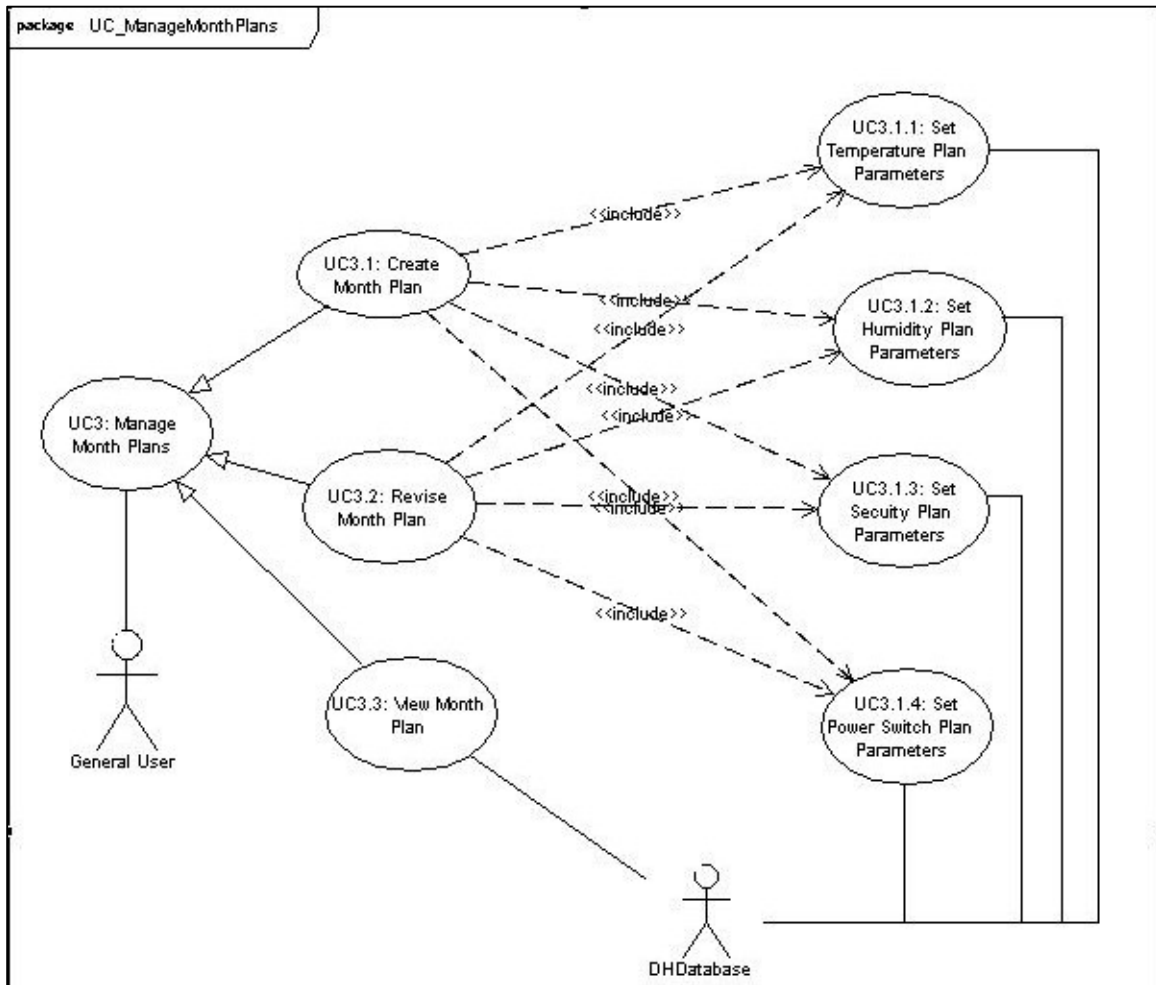


Figure 3: UC3 Manage Month Plans

Use Case ID: UC3

Use Case: Manage Month Plans

Goal: Manage the monthly plans which control the environment of a Digital Home.

Primary Actor: General User

Secondary Actor: DH Database

Pre:

1. User is logged into her/his DH account.
2. DH Main Page is displayed on the user display device.

Post:

1. Month Plan operation has been completed
2. DH Main Page is displayed on the user display device.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
1	Select Manage Month Plan option	2	Requests user to enter month and year
3	Enter month and year	4	Display month calendar
		5	Display "Which operation do you want to perform: a. Create a month plan. b. Revise a month plan. c. View a month plan. d. Exit Month Plan Page
6A	Select a.	7A	Invoke UC 3.1
6B	Select b.	7B	Invoke UC 3.2
6C	Select c.	7C	Invoke UC 3.3
6D	Select d.	7D	continue
		8	Display DH Main Page

UC GUIs: DH Main Page, Thermostat Month Plan Page, Humidity Month Plan Page, Security Month Plan Page, Power Switch Month Plan Page

Exceptions:

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)

Use Cases Utilized: UC-3.1, UC-3.2, UC-3.3

Notes and Issues: When the DH Technician sets up and configures a DH System, he/she sets the default values for the system (see UC-1 Configure DH System)

Use Case ID: UC3.1

Use Case: Create Month Plan

Goal: Create the plan for setting and controlling the environmental, security and appliance characteristics of a Digital Home for a calendar month.

Primary Actor: General User

Secondary Actor: DH Database

Pre:

1. User has selected Create Month Plan option.
2. Month Calendar is displayed.

Post:

1. A month plan has been created and saved to the DH database.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
		1	Default environmental parameters are entered for all days, and a message about this is displayed.
		2	Display the Thermostat Month Plan Page
3	Include UC3.1.1 (Set Temperature Plan Parameters)		
		4	Display the Humidity Month Plan Page
5	Include UC3.1.2 (Set Humidity Plan Parameters)		
		6	Display the Security Month Plan Page
7	Include UC3.1.3 (Set Security Plan Parameters)		
		8	Display the Power Switch Month Plan Page
9	Include UC3.1.4 (Set Power Switch Plan Parameters)		
		10	Request "Submit and Exit"
11	Enter "Submit and Exit"	12	Save Month Plan to DH Database

UC GUIs: DH Main Page, Thermostat Month Plan Page, Humidity Month Plan Page, Security Month Plan Page, Power Switch Month Plan Page

Exceptions:

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)
3. A plan already exists for the month and year entered.
 - Response: print a message about the existence of the plan and return to the main menu.

Use Cases Utilized: UC-3.1.1, UC-3.1.2, UC-3.1.3, UC-3.1.4

Notes and Issues: When the DH Technician sets up and configures a DH System, he/she sets the default values for the system (see UC-1 Configure DH System)

Use Case ID: UC3.2

Use Case: Revise Month Plan

Goal: Revise an existing month plan for setting and controlling the environmental, security and appliance characteristics of a Digital Home for a calendar month.

Primary Actor: General User

Secondary Actor: DH Database

Pre:

1. User has selected Revise Month Plan option.
2. Month Calendar is displayed.

Post:

1. A month plan has been revised and saved to the DH database.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
		1	Retrieve month plan from DH Database.
		2	Display the Thermostat Month Plan Page
3	Include UC3.1.1 (Set Temperature Plan Parameters)		
		4	Display the Humidity Month Plan Page
5	Include UC3.1.2 (Set Humidity Plan Parameters)		
		6	Display the Security Month Plan Page
7	Include UC3.1.3 (Set Security Plan Parameters)		
		8	Display the Power Switch Month Plan Page
9	Include UC3.1.4 (Set Power Switch Plan Parameters)		
		10	Request "Submit and Exit"
11	Enter "Submit and Exit"	12	Save Month Plan to DH Database

UC GUIs: DH Main Page, Thermostat Month Plan Page, Humidity Month Plan Page, Security Month Plan Page, Power Switch Month Plan Page

Exceptions:

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)
3. A plan does not exist for the month and year entered.
 - Response: print a message about the non existence of the plan and return to the main menu.

Use Cases Utilized: UC-3.1.1, UC-3.1.2, UC-3.1.3, UC-3.1.4

Notes and Issues: When the DH Technician sets up and configures a DH System, he/she sets the default values for the system (see UC-1 Configure DH System)

Use Case ID: UC3.3

Use Case: View Month Plan

Goal: View an existing month plan.

Primary Actor: General User

Secondary Actor: DH Database

Pre:

4. User has selected View Month Plan option.

5. Month Calendar is displayed.

Post: None

Main Success Scenario:

Step	Actor Action	Step	System Reaction
		1	Retrieve month plan from DH Database.
		2	Display the Thermostat Month Plan Page
		3	Display “Press enter to display the Humidity Month Plan Page”
4	Press enter	5	Display the Humidity Month Plan Page
		6	Display “Press enter to display the Security Month Plan Page”
7	Press enter	8	Display the Security Month Plan Page
		9	Display “Press enter to display the Power Switch Month Plan Page”
10	Press enter	11	Display the Power Switch Month Plan Page

UC GUIs: DH Main Page, Thermostat Month Plan Page, Humidity Month Plan Page, Security Month Plan Page, Power Switch Month Plan Page

Exceptions:

6. User fails to make an entry.

- Response: Timeout after 5 minutes and logout of system

7. Improper data entered (e.g., wrong data type or out of range data)

- Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)

8. A plan does not exist for the month and year entered.

- Response: print a message about the non existence of the plan and return to the main menu.

Use Cases Utilized: none

Notes and Issues: When the DH Technician sets up and configures a DH System, he/she sets the default values for the system (see UC-1 Configure DH System)

Use Case ID: UC3.1.1

Use Case: Set Temperature Plan Parameters

Goal: Sets the thermostat set points for time periods for each thermostat, for a specified month/year and set of days.

Primary Actor: General User

Secondary Actor: DH Database

Pre:

1. User has specified a month and a year for temperature settings.
2. Thermostat Month Plan Page (with month calendar) is displayed.

Post:

1. Temperature set points are set for the specified thermostats, periods, and days during the specified month/year.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
1	Select day(s)	2	Request "Enter or revise (up to 4) time periods (start/end) and set point temperature values for each thermostat" Display "The 4 periods must extend over 24 hours. "and "Thermostats with no values entered will be set to the default values."
3	Enter time and temperature values for each thermostat.	4	Display "Days with no values entered will be set to the default temperature values or previously set values" "Other days? Yes/No"
5A	Enter "Yes"	6A	Go to Step 1
5B	Enter "No"	6B	Save day/period/set point values to the month plan in DH Database and display confirmation message.

UC GUIs: DH Main Page, Thermostat Month Plan Page

Exceptions:

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)

Use Cases Utilized: none

Notes and Issues:

1. When the DH Technician sets up and configures a DH System, he/she sets the default values for the system (see Configure DH System)
2. The format day(s) means one or more days. For example, the entry for day(s) might be "13" or "1, 3-9, 12-18, 21-27, 30".

Use Case ID: UC3.1.2

Use Case: Set Humidity Plan Parameters

Goal: Sets the humidistat set points for time periods for each humidistat, for a specified month/year and set of days.

Primary Actor: General User

Secondary Actor: DH Database

Pre:

1. User has specified a month and a year for humidity settings.
2. Humidistat Month Plan Page (with month calendar) is displayed.

Post:

1. Humidistat set points are set for the specified humidistats, periods, and days during the specified month/year.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
1	Select day(s)	2	Request "Enter or revise (up to 4) time periods (start/end) and set point humidity values for each humidistat; the 4 periods must extend over 24 hours." Display "Humidistats with no values entered will be set to the default values"
3	Enter time and temperature values for each thermostat.	4	Display "Days with no values entered will be set to default humidity values or previously set values" "Other days? Yes/No"
5A	Enter "Yes"	6A	Go to Step 1
5B	Enter "No"	6B	Save day/period/set point values to the month plan in DH Database and display confirmation message.

UC GUIs: DH Main Page, Humidistat Month Plan Page

Exceptions:

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)

Use Cases Utilized: none

Notes and Issues:

1. When the DH Technician sets up and configures a DH System, he/she sets the default values for the system (see Configure DH System)
2. The format day(s) means one or more days. For example, the entry for day(s) might be "13" or "1, 3-9, 12-18, 21-27, 30".

Use Case ID: UC3.1.3

Use Case: Set Security Plan Parameters

Goal: Set security contact sensors to “on” for periods for a specified month and set of days.

Primary Actor: General User

Secondary Actor: DH Database

Pre:

1. User has specified a month and a year for security settings.
2. Security Month Plan Page (with month calendar) is displayed.

Post:

1. Security Parameters are set for all contact sensors for the specified periods, and days during the specified month.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
1	Select day(s)	2	Request “Enter or revise (up to 4) ON time periods (start/end) “. Display “For time periods not designated, all contacts will be set to OFF”
3	Select period(s)	4	Contact sensors state recorded as ON for the selected time period(s), and OFF for other periods.
		5	Display “For days not selected, all contact sensors will be set to OFF for the entire day. “Other days? Yes/No”
6A	Enter “Yes”	7A	Go to Step 1
6B	Enter “No”	7B	Save Day/period ON/OFF values to the month plan in the DH Database and display confirmation message.

UC GUIs: DH Main Page, Security Month Plan Page

Exceptions:

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)

Use Cases Utilized: none

Notes and Issues:

1. When the DH Technician sets up and configures a DH System, he/she sets the default values for the system (see Configure DH System)
2. The format day(s) and period(s) means one or more days and periods, respectively. For example, the entry for day(s) might be “13” or “1, 3-9, 12-18, 21-27, 30”.

Use Case ID: UC3.1.4**Use Case:** Set Power Switch Parameters

Goal: Set power switches to “on” for specified time periods for a specified month and set of days.

Primary Actor: General User

Secondary Actor: DH Database

Pre:

1. User has specified a month and a year for power switch settings.
2. Power Switch Month Plan Page (with month calendar) is displayed.

Post:

1. Power Switch Parameters are set for all power switches for the specified periods, and days during the specified month.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
1	Select day(s)	2	Request “select room”
3	Select room	4	Request “select power switch(es)” Display “For power switches not selected, they will be set to OFF or to previously stored values”
5	Select power switch(es)	6	Request “select or revise ON time period(s)” Display “For periods not designated as ON, for a power switch in the room, it will be set to OFF”
7	Select ON time period(s)	8	Power switch(es) states recorded for the selected period(s), for the designated days.
		9	Display “For rooms not selected, all power switches will be set to OFF for the entire day or to previously stored values. “Other rooms? Yes/No”
10A	Enter “Yes”	11A	Go to Step 3
10B	Enter “No”	11B	Display “For days not selected, all power switches will be set to OFF for all rooms, for the entire day. “Other days? Yes/No”
12A	Enter “Yes”	13A	Go to Step 1
12B	Enter “No”	13B	Save Day/room/period ON/OFF values to the month plan in the DH Database and display confirmation message.

UC GUIs: DH Main Page, Power Switch Parameter Page**Exceptions:**

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)

Use Cases Utilized: none

Notes and Issues:

1. When the DH Technician sets up and configures a DH System, he/she sets the default values for the system (see Configure DH System)
2. The format day(s), room(s), power switch(es) and period(s) means one or more days, rooms, power switches, and periods, respectively. For example, the entry for day(s) might be “13” or “1, 3-9, 12-18, 21-27, 30”.

UC4: Prepare Month Report

Use Case ID: UC4

Use Case: Prepare Month Report

Goal: Prepare a DH monthly report that includes data about temperature and humidity values, security breaches, and error messages.

Primary Actor: General User

Secondary Actor: DH Database

Pre:

1. User is logged into her/his DH account.
2. DH Main Page is displayed on the user display device.

Post:

1. A monthly report has been prepared.
2. DH Main Page is displayed on the user display device.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
1	Select Monthly Report option	2	Requests user to enter month and year
3	Enter month and year	4	Compute the following values: for each thermostat, the average temperature for each day of the month, along with the times and values of the maximum and minimum temperatures for each day.
		5	Computes the following values: for each humidistat, the average humidity for each day of the month, along with the times and values of the maximum and minimum temperatures for each day.
		6	Determines information about any security breaches (sensor ID and date/time of occurrence)
		7	Determines information about any periods (date/time and time interval) when the DH System was turned off.
		8	Uses information from steps 4-7 to prepare report.
		9	Displays the report and returns to the DH Main Page

UC GUIs: DH Main Page, Monthly Report Page

Exceptions:

1. User fails to make an entry.
 - Response: Timeout after 5 minutes and logout of system
2. Improper data entered (e.g., wrong data type or out of range data)
 - Response: Prevented with GUI design (drop down lists, list boxes, bounded range components, etc.)
3. Data does not exist for the month and year entered.
 - Response: print a message about the non existence of the data and return to the main menu.

Use Cases Utilized: none

UC5: View Sensor Values

Use Case ID: UC5

Use Case: View Sensor Values

Goal: Get and display the current values of the temperature, humidity, contact sensor state, power switch state

Primary Actor: General User

Secondary Actor: DH Gateway, Time

Pre:

1. User is logged into her/his DH account.
2. DH Main Page is displayed on the user display device.

Post:

1. DH Main Page is displayed on the user display device.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
1	Request display of sensor values.	2	Read values, through DH Gateway, of temperature, humidity, states of power switches, state of contact sensors, and alarm states.
		3	Display values and states on DH Sensor Values Page
		4	Delay delta T
5A	No exit page request	6A	Go to2
5B	Exit page requested	6B	Display DH Main Page

UC GUIs: DH Main Page, Sensor Values Page

Exceptions: none

Use Cases Utilized: none

Notes and Issues:

- The delta T delay time would be chosen appropriate for the sensor update/ read times and database write times.
- Time is a virtual actor that provides the current date and time.

UC6: Read Sensor Values

Use Case ID: UC6

Use Case: Read Sensor Values

Goal: Read the current values of the temperature, humidity, contact sensor state, power switch state and store in DH Database

Primary Actor: Time

Secondary Actors: DH Gateway, DH Database

Pre:

1. Operation of DH System initiated.
2. Sensor values stored in DH Database during time of operation

Post:

1. Operation of DH System terminated.

Main Success Scenario:

Step	Actor Action	Step	System Reaction
1	Date and time provided	2	Read values, through DH Gateway, of temperature, humidity, states of power switches, state of contact sensors, and alarm states.
		3	Write sensor values, alarm states, and date and time to DH Database
		4	Delay delta T
		5	Go to step 1

UC GUIs: none

Exceptions: none

Use Cases Utilized: none

Notes and Issues:

- The delta T delay time would be chosen appropriate for the sensor update/ read times and database write times.
- Time is a virtual actor that provides the current date and time.

UC7: Control DH Environment

Use Case ID: UC7

Use Case: Control DH Environment

Goals:

- Using the current month plan or the default values set the values of the temperature, humidity, contact sensor state, power switch state.
- Activate the security alarms if a contact sensor is breached.

Primary Actor: Time

Secondary Actors: DH Gateway, DH Database

Pre:

1. Operation of DH System has been initiated (DH Database contains an ON operation state)

Post:

1. Operation of DH System is terminated (DH Database contains an OFF operation state)

Main Success Scenario:

Step	Actor Action	Step	System Reaction
1	Date and time provided	2	Get, from DH Database, month plan for current date and read controller values for current time. If no such plan exists, get default values for current data and time.
		3	Send controller values to controllers, through the DH Gateway.
		4	Check if a contact sensor has been breached and if so, activate alarms.
		4	Delay delta T
		5	Go to step 1

UC GUIs: none

Exceptions:

1. Alarms are turned off manually
- Response: Terminate operation and restart system with current month plan or default values, whichever is applicable.

Use Cases Utilized: none

Notes and Issues:

- The delta T delay time would be chosen appropriate for the sensor update/ read times and database write times.
- Time is a virtual actor that provides the current date and time.