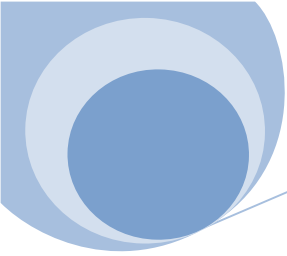


# Continuous Live Data System Set Up Procedures

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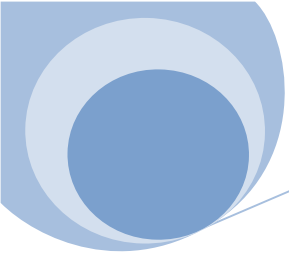
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# Continuous Live Data System Set Up Procedures

## System Configuration Overview

The basic web user interface system is designed to display data and generate reports based on the data received from a given system. Each system is assigned a SYSID during set up. This ID along with the System MAC Address (DAMID) becomes the basis for mapping data from the system to the appropriate field in the data tables. The mapping tables are designed to be flexible and allow the system administrator to customize a system using existing configurations by only defining the differences between a reference system and the actual configuration. New configurations as may be defined in the future.

There are two main tables used to accomplish the customization. The SYSMAP table contains the basic mapping of a specific sensor name to the appropriate database table. The WEBREFTABLE table maps the specific sensor names to the web pages displaying the data. Both tables contain a reference system. This Sensor Mapping concept starts with a reference system as a default and allows you to change the mapping to match the new system as installed. The reference system is defined in the tables as SYID =0 and DAMID=000000000000. The mapping functions described in the set up sections of this document automatically generates record updates required for new system configurations. Once successfully completed, all reports should represent the actual configuration of the new system.

## Setting up a New System

The process of setting up a new system consists of several steps. These processes are only available to a user with system administration privileges. The setup process encompasses gathering information on the customer, the building where system is installed and then configuring the system with detailed information on the system and sensors.

The process flow diagram is depicted in figure 1 and continued in figure 2 below.

First, the system admin must determine if the new system belongs to a new or existing customer.

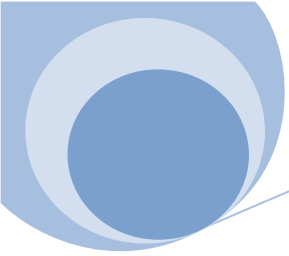
### New Customer

To enter information about a new customer, the system admin must first go to the Site Administration Page. The Site Administration Page can be accessed from the right side of the top menu by selecting

*UserName* Admin → Admin

On the Site Administration page – Select **+ Add New Customer**

Upon completion of all the fields – Select **✓ Save** to register the new customer.



# Continuous Live Data System Set Up Procedures

Upon return and refresh of the Site Administration Page, this customer will now appear in the listing.

It should be noted that each customer should have a corresponding user account with manager privileges. Account managers can then create other user accounts (see Adding New Users below).

## Existing Customer

For new systems assigned to existing customers, you simply select the customer of interest on the Site Administration Page. From here you will have access to several functions. You can edit the customer information, add users to this customer and add new buildings for this customer.

**Edit Customer Information** - [Edit Customer Info](#)

Use this function to update information about the base customer.

**Adding New Users** - [+ Add User](#)

This function allows the administrator or account manager to add additional users to a Customer Account. There are several levels of Authorization for a customers account. These are selected from the Account Level drop down.

User – This is basic user who can view all of the information about the systems associated with this customer, but cannot make any changes to the account.

Manager – This is the primary owner of the customer account who can view all information and create other user accounts.

Administrator – This status is limited to individuals who can create new customer accounts, add new buildings and add new systems and modify the configurations of systems.

## Editing Existing Users

Existing user information can be edited by a customer with manager privileges or the system administrator. First select the customer on the site administration page. Then click on the appropriate name from the list under Users. This will give you access to the User Profile screen. From here, the user name and email can be changed, passwords can be reset and users can be removed.

# Continuous Live Data System Set Up Procedures

## Setting Up a New System

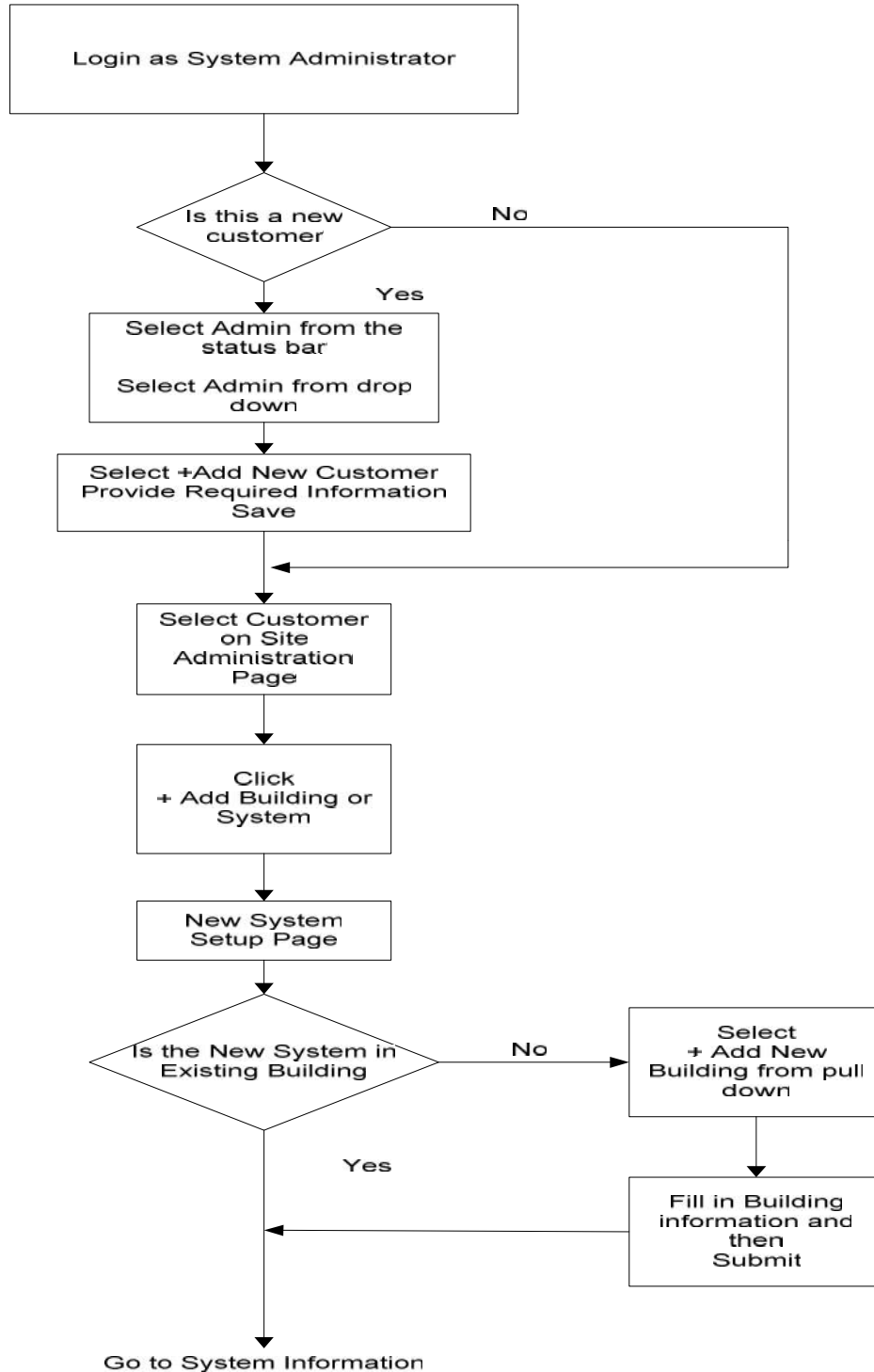
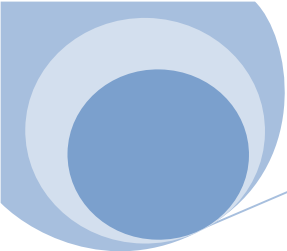


Figure 1 – Setting Up a New System



# Continuous Live Data System Set Up Procedures

## Setting Up a New System (cont.)

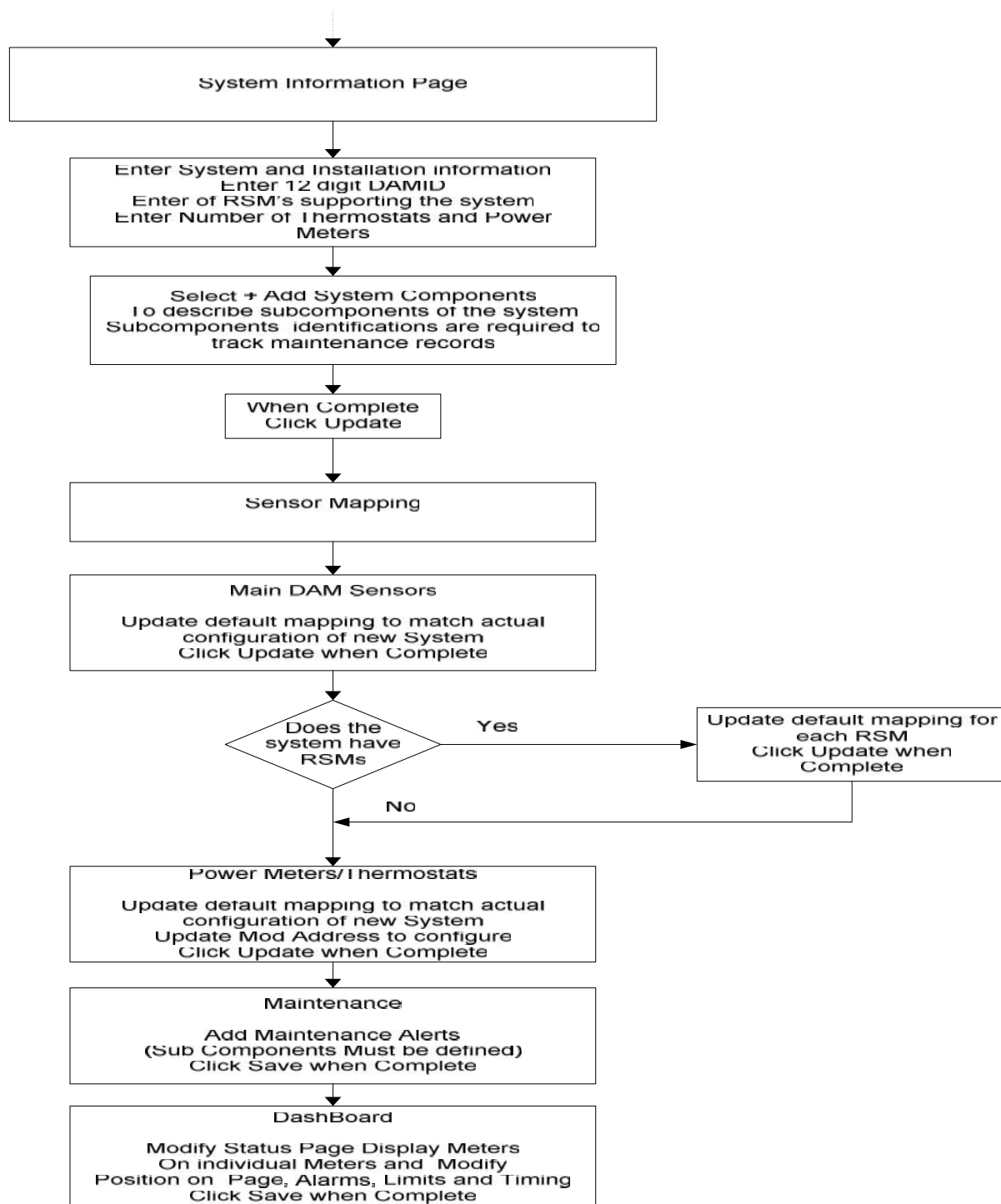
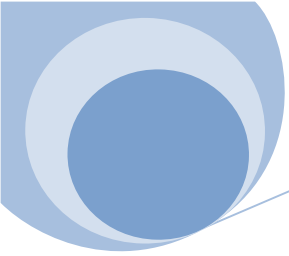


Figure 2 – Setting Up a New System (cont.)



# Continuous Live Data System Set Up Procedures

## Setting up a New Building

There are two ways of accessing the screens to allow you to set up a new building.

The first method is from the Site Administration Page → Select a Customer → **+ Add Building**  
This will take you to the New System Setup screen. Using the drop down under Select a Building  
Select + Add New Building

The second method of access is through the Setup menu on the top menu bar.

Setup → System Setup → New System Setup

From here you can use the drop down under Select a Building  
Select + Add New Building

Once on the new building screen, fill out the required fields and Click on **✓ Submit**

The System Information Tab will now expand.

## Adding a System to an Existing Building

You can add an additional system within an existing building by following:

Setup → System Setup → New System Setup

Once on the New System Setup page; select the Building of interest and the System Information Tab will now expand.

## System Information

This form is the first of a series used to define the base configuration of the system and the configurations of the sensors.

The top portion of the form gathers information facilities the definition of the system configuration, heat exchange unit and installation information.

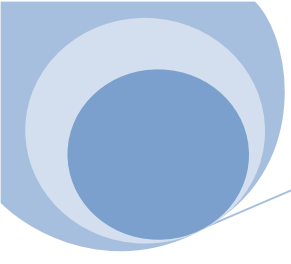
The bottom half of the form is used to define the configurations for the monitoring control and sensor systems.

The DAMID is the 12 digit MAC address of the controller board.

The Number of RSMs is the total number of add on Remote Sensor Boards not including the main board.

The number of Thermostats is the total number of mod bus addressed thermostats

The Number of Power Meters is the total number of mod bus addressed power meters.



# Continuous Live Data System Set Up Procedures

The Enable AnalogMux allows you to enable this function in the future.

Towards the lower left corner is the +Add System Components Link

This link allows the identification and inclusion of system subcomponents. These subcomponents may include the air handlers, fans, pumps etc. Definition of these components is required to use the maintenance alert function of the system. It also provides a convenient place to store the manufacturer, model numbers and serial numbers. There is no limit to the number of subcomponents.

Click on **Update** when complete to store information.

## Sensor Mapping

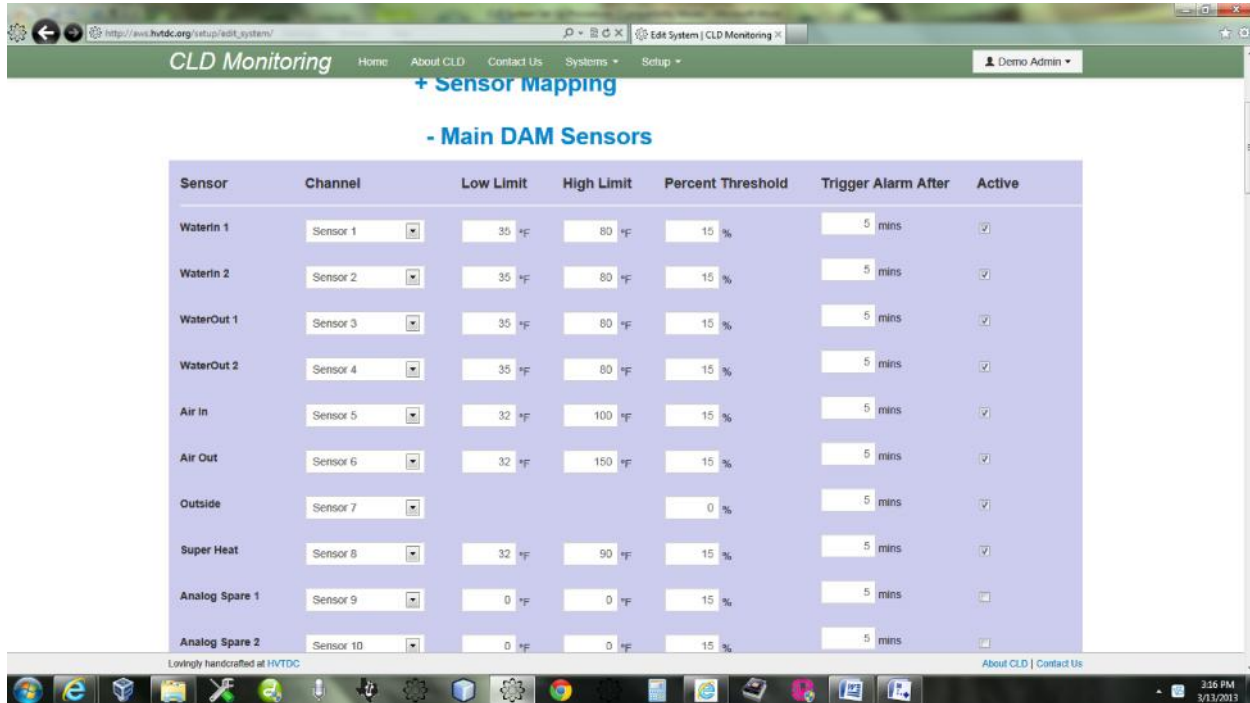
This is the area which allows for the personalization of the system sensors to match the actual hardware configuration. These tables define the mapping which drives all of the status and reports in the system. The Sensor Mapping concept starts with a reference system as a default and allows you to change the mapping to match the new system as installed.

There are default maps defined for the Main Board, RSM boards and the Thermostats/Power Meters. The default maps are defined in the appendix A. If your system matches these maps you do not need to make any changes. If not which will be the probable case. You can change information to describe each sensor channel in the system.

The DAM and RSM Sensor Maps are almost identical in format and content with the expectation being four additional flow meter sensors are included on the DAM and not on the RSMs. There can be any number of RSMs on a given system. The appropriate number of RSM maps will be presented based on the information provided in the System Information Tab.



# Continuous Live Data System Set Up Procedures



The screenshot shows a web browser window with the URL [http://www.hvtdc.org/setup/edit\\_system/](http://www.hvtdc.org/setup/edit_system/). The page title is "CLD Monitoring" and it includes navigation links: Home, About CLD, Contact Us, Systems, and Setup. A user dropdown menu shows "Demo Admin". The main heading is "+ Sensor Mapping" and the sub-heading is "- Main DAM Sensors". Below this is a table with 10 rows and 7 columns. The columns are: Sensor, Channel, Low Limit, High Limit, Percent Threshold, Trigger Alarm After, and Active. The rows represent various sensors: WaterIn 1, WaterIn 2, WaterOut 1, WaterOut 2, Air In, Air Out, Outside, Super Heat, Analog Spare 1, and Analog Spare 2. Each row has a dropdown menu for the Channel, numerical values for Low and High Limits (with units like °F), a percentage for the Percent Threshold, a time value for Trigger Alarm After (in minutes), and a checkbox for the Active status.

Sensor	Channel	Low Limit	High Limit	Percent Threshold	Trigger Alarm After	Active
WaterIn 1	Sensor 1	35 °F	80 °F	15 %	5 mins	<input checked="" type="checkbox"/>
WaterIn 2	Sensor 2	35 °F	80 °F	15 %	5 mins	<input checked="" type="checkbox"/>
WaterOut 1	Sensor 3	35 °F	80 °F	15 %	5 mins	<input checked="" type="checkbox"/>
WaterOut 2	Sensor 4	35 °F	80 °F	15 %	5 mins	<input checked="" type="checkbox"/>
Air In	Sensor 5	32 °F	100 °F	15 %	5 mins	<input checked="" type="checkbox"/>
Air Out	Sensor 6	32 °F	150 °F	15 %	5 mins	<input checked="" type="checkbox"/>
Outside	Sensor 7			0 %	5 mins	<input checked="" type="checkbox"/>
Super Heat	Sensor 8	32 °F	90 °F	15 %	5 mins	<input checked="" type="checkbox"/>
Analog Spare 1	Sensor 9	0 °F	0 °F	15 %	5 mins	<input type="checkbox"/>
Analog Spare 2	Sensor 10	0 °F	0 °F	15 %	5 mins	<input type="checkbox"/>

Figure 3 - Sensor Mapping for DAM and RSM

## DAM and RSM Mapping

The DAM and RSM maps are organized in two major sections – Analog Sensors and Digital Sensors. As mentioned the DAM has a third section containing four flow meters. Referring to the figure 3 above, the section columns are nearly identical for all sensor types with some personalization as will be noted.

The first column is the Sensor Function. This is fixed for the current release.

The second column is the Channel. This allows re-mapping of the sensor functions to different channels in the database. As an example, normally the WaterIn 1 sensor is on channel 1 of the DAM. This can be changed to map this function to any of the 16 analog channels. The mapping table will be modified for this system only to redirect the data from the defined channel to the proper column in the database. The analog channels are the first 16. The digital channels are the second 16. Analog functions are limited to be remapped on only analog channels as is digital functions only on digital channels.

The third and fourth columns are the expected low and high limits of the data on that channel. These limits are used to trigger alerts and alarms.

The fifth column is the Percent Threshold for the alarm. A yellow alert will trigger based in this percentage of the delta between the high and low limit as the sensor data approaches either of these limits.

# Continuous Live Data System Set Up Procedures

The sixth column sets the time after which and email alert is sent for a given alarm.

The seventh column determines if a given sensor is active for this system. Un checking this box will remove the corresponding sensor from consideration on all system status and reporting pages.

For the DAM the additional channels are for the flow meters. These can be remapped only to the four Flow/Pressure Channels.

Once the mapping is complete clicking the **Update** control will save the changes. This action generates new system specific records for only those sensors upon which changes were made. If no changes were made for a given sensor the default values will still prevail.

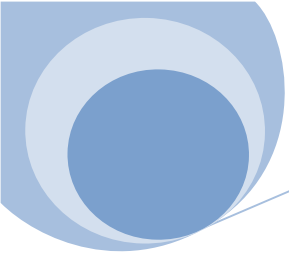
## Power Meters and Thermostats Mapping

Sensor	Model	Address	Channel	Low Limit	High Limit	Percent Threshold	Trigger Alarm After	Active
WP		2						<input checked="" type="checkbox"/>
Power			Power 1			0 %	5 mins	<input checked="" type="checkbox"/>
Voltage			Power 2	216 V	264 V	15 %	5 mins	<input checked="" type="checkbox"/>
Current			Power 3			0 %	5 mins	<input checked="" type="checkbox"/>
Energy Aggr.			Power 4			0 %	5 mins	<input checked="" type="checkbox"/>
HP		1						<input checked="" type="checkbox"/>
Power			Power 1			0 %	5 mins	<input checked="" type="checkbox"/>
Voltage			Power 2	216 V	264 V	15 %	5 mins	<input checked="" type="checkbox"/>
Current			Power 3			0 %	5 mins	<input checked="" type="checkbox"/>
Energy Aggr.			Power 4			0 %	5 mins	<input checked="" type="checkbox"/>

Figure 4 - Power and Thermostat Mapping

As with the DAM and RSM mapping pages, the default maps are defined in the appendix A. If your system matches these maps you do not need to make any changes. If not which will be the probable case. You can change information to describe each sensor channel in the system. The fields in this map are similar to the DAM/RSM maps with some additions. Refer to Figure 4 for the Power and Thermostat Mapping

The meters may be from different manufacturers. The model and type can be selected from the pull down in the model column (2).



# Continuous Live Data System Set Up Procedures

The meters utilize the mod bus and therefore require a unique address for each meter. This is defined in the address column (4).

As for channels, power meters may choose from the four power channels. However the thermostats outputs are fixed for a given model.

Any number of Power meters and thermostats may be included as long as they occupy different channels.

Once the mapping is complete clicking the **Update** control will save the changes. This action generates new system specific records for only those meters upon which changes were made. If no changes were made for a given meter the default values will still prevail.

Note the default system show two power meters and two thermostats. The second thermostat is not active in the default.

## Maintenance

The system allows you to define maintenance requirements for given system installations. These requirements are defined to the subcomponent level based on the system components defined under system information. If a system component does not appear in the pull down, it must be first defined in the system information section.

Maintenance records are generated and scheduled using work orders. To add a maintenance requirement first click on **+Add Maintenance**; a maintenance form will appear.

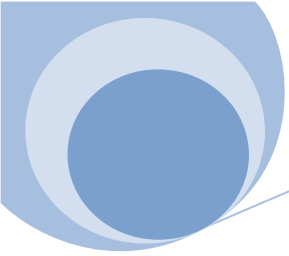
Select the system component of interest; define the action required and the date required.

You can now define a cycle time for maintenance needed on a regular basis. Choosing auto schedule – On will automatically generate the next required maintenance based on the cycle time and completion date of the current request.

Clicking on **✓ Save** will generate the work order and add it to the scheduled maintenance section, where it can be tracked to completion.

## Dashboard

The Dashboard is configured around a fixed image of the system. These images are associated with each system configuration. There are currently three configurations defined; Open Loop with DryWell, Open Loop without Drywell and Closed Loop. Additional configurations can be added by selecting [Setup->System Parameter Listings -> Add a New Rec](#) from the navigation menu. The subgroup should be defined as [Configuration](#). A configuration name and two images can be added and uploaded; a main system image and a drywell image.



# Continuous Live Data System Set Up Procedures

Once set up modifications to the sensors can be made using this set up section. By clicking on the meter of interest; this will bring up a screen with the characteristics of that sensor. You can change the alarm settings and move the x and y positions of the meter on the display. You can also change the name as it appears of the dashboard. These changes will be unique to the selected system.

## Modifying Existing Systems

Once a system is set up the system administrator can modify the System Information, Sensor Mapping, Maintenance and Dashboard tables by using the Modify Existing System screen.

From the Menu Bar – Setup → System Setup → Modify Existing System

To access the system of interest, first select a building, then a system; the individual screens can now be accessed and will function as described above.

## System Configuration Parameters

This section is used to set up the pull down options which support the system setup screens.

The options are categorized into three major areas, with each area capable of supporting subgroups of parameters. As new system types and new model sensors are introduced, they can be added to the appropriate listings and then will become visible as an option on the various set up menus.

The subgroups for each area are predefined, however can be modified by the database administrator if new requirements arise in the future.

## System Hardware Listings

Use this section to define hardware components. It is currently set up to allow selection of various heat exchangers on the System Information screen. New records can be added using the **+ Add a New Rec** control. The user must define the name of the unit in the Name field and a unique numeric value to each new entry in the value field. Updates are saved by clicking **Save**.

## Sensor Hardware Listings

This section defines the available models for the sensors. There are currently five subgroups to cover the various types of sensors. They are Analog, Digital, FlowPress, Power and Therm.

## System Parameter Listings

This section defines the various pull downs used on the System Information screens. The defined subgroups are Configuration, Platform ID and SystemType.

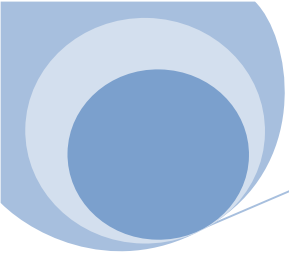
# Continuous Live Data System Set Up Procedures

Using this listing new configurations and images can be defined and existing configurations can be modified. To define a new configuration, first select **+ Add a New Rec**. Next using the Sub Group pull-down select Configuration. The name of a configuration can now be defined along with a unique value representing that configuration. The new configuration needs to be saved using the **/ Save** button.

The configuration images which are used on the Status Page can now be defined and updated. First Click on **System Images** for the configuration of interest. The Images for System Configuration page will now be displayed for the selected configuration. Images can be defined for the Main system and Loop Configuration for both heating and cooling mode. Previously updated image files will appear as pull-downs in the File Name row. The selected image will appear in the image row immediately below. Once images have been selected for each configuration, they may be displayed using the **+ Display Heating Configuration** and/or the **+ Display Cooling Configuration** links. These will show the images as they will appear on the full view Status Page. The position of the system image is fixed, however the loop image may be adjusted to mate with the system image using the values in the input boxes for Loop Position Top and Loop Position Left.

New image files can be uploaded to the system using the **Upload New Image** button. The images are expected to be in Portable Network Graphics (.png) format. Once uploaded they will appear and can be selected from the File Name pull-down. Modifications to existing images can be uploaded in the same manner and will replace the existing files

The screenshot displays the 'Images for System Configuration - Closed Loop' page. It features a table with four columns: 'System Image - Heating', 'System Image - Cooling', 'Loop Image - Heating', and 'Loop Image - Cooling'. Each column contains a 'File Name' dropdown menu and an 'Image' preview area. Below the table are two large blue buttons: '+ Display Heating Configuration' and '+ Display Cooling Configuration'. At the bottom, there are input fields for 'Loop Position Top - px' (value 405) and 'Loop Position Left - px' (value 500), along with 'Upload New Image' and 'Save Changes' buttons.



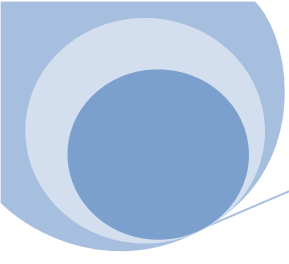
# Continuous Live Data System Set Up Procedures

## Appendix A

### Default System Configuration

The default configuration assumes a system which includes a DAM, one RSM, one modbus thermostat and two modbus power meters. The sub units are configured

- **Main DAM and RSM1**
  - Analog Sensors ( 16 Total)
    - Sensor 1 – WaterIn 1 - Active
    - Sensor 2 – WaterIn 2 - Active
    - Sensor 3 – WaterOut 1 - Active
    - Sensor 4 – WaterOut 2 - Active
    - Sensor 5 – Air In - Active
    - Sensor 6 – Air Out - Active
    - Sensor 7 – Outside - Active
    - Sensor 8 – Super Heat - Active
    - Sensor 9 to Sensor 16 – Analog Spare 1 to Analog Spare 8 – Inactive
  - Digital Inputs/Outputs ( 16 Total)
    - Digital In 1 – Y1 (Stage 1) - Active
    - Digital In 2 – Y2 (Stage 2) - Active
    - Digital In 3 – O (Cooling) - Active
    - Digital In 4 – F (Fan) - Active
    - Digital In 5 – W (AuxH) - Active
    - Digital In 6 – V1 (Value1) - Active
    - Digital In 7 – V2 (Value 2) - Active
    - Digital In 8 – V3 (Value 3) - Active
    - Digital Out 1 to Digital Out 8 – Inactive
    -
  - Flow/Pressure ( 16 Total) – **Main DAM only**
    - Flow/Pressure 1 – Flow Main - Active
    - Flow/Pressure 2 – Pressure - Active
    - Flow/Pressure 3 – Flow RSM - Active
    - Flow/Pressure 4 – Flow Spare – Active



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- **Power Meters/Thermostats**
  - Power Meter 1 – WP – Address 3 – Active
    - Power 1 – Power – Active
    - Power 2 – Voltage – Active
    - Power 3 – Current – Active
    - Power 4 – Energy Aggr. – Active
  - Power Meter 2 – WP – Address 1 – Active
    - Power 1 – Power – Active
    - Power 2 – Voltage – Active
    - Power 3 – Current – Active
    - Power 4 – Energy Aggr. - Active
  - Thermostat 1 – Address 8 - Active
    - Cool SP – Active
    - Heat SP – Active
    - LCD Temp – Active
    - Therm Mode – Active
  - Thermostat 2 – Address 8 - InActive
    - Cool SP – InActive
    - Heat SP – In Active
    - LCD Temp – InActive
    - Therm Mode -InActive