



***SiteSage***

## Controller Installation Guide

Last Update - August, 2015

# SiteSage Controller Installation Guide

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## Important Safety Information

***NOTE: Installation should not be started until the qualified installer has read this entire Installation Guide.***

The SiteSage® Controller allows customers to control branch circuits remotely using the <https://sitesage.net> portal or the SiteSage mobile applications. Pilot Relays in the Controller must be connected to contactors which in turn are connected between the breaker and the load to be controlled, allowing the circuit to be turned on or off. The SiteSage Controller can be used either with previously installed contactors OR with a contactors in a SiteSage provided Contactor Box.



**Installation must be done by a licensed electrician.**

When connecting branch circuits to the contactors, the breaker(s) powering the branch circuits must be turned off.

The SiteSage Controller is suitable for installation with 120/240V single-phase 60Hz service as well as 3-phase 208v or 480v service normally found in North America. It is not suitable for 230V 50Hz service commonly found in other regions of the world or 346/600V service still in use in parts of Canada.

All wiring in the United States must be installed in accordance with the latest adopted edition of the National Electrical Code (ANSI/NFPA 70, NEC) and state or local requirements. All wiring in Canada must be installed in accordance with the latest adopted edition of the Canadian Electrical Code (CSA C22.2 CEC, Part I) and any provincial or local requirements.

**SiteSage™**  
**Controller**

**950-000011**

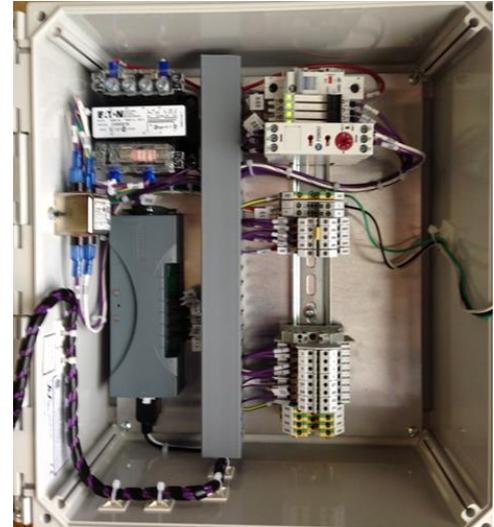
Input: 24VAC • 50/60Hz 2A  
Non-Isolated output  
Contains FCC ID: OA3MRF24J40MB  
Contains IC: 7693A-24J40MB  
Powerhouse Dynamics, Inc. Made in USA



# 1. Introduction to the SiteSage Controller

The *SiteSage Controller* can be used to easily and remotely control virtually any equipment, from lighting to exhaust hoods to hot water heaters. Schedules can be created centrally and shared across the enterprise.

The *Site Sage Controller* is a modular system designed to address a variety of different scenarios. The Controller itself comes fully provisioned with a “Control Pod” (the system brain) and four 120V Pilot Relays installed in a UL listed enclosure; a version with 8 Pilot Relays is also available. It is designed to work with existing contactors or be connected to new (120V) contactors which may also be provided as part of the SiteSage system in UL approved panels.



There are currently three SiteSage Contactor Panel configurations available; a 2-contactor version, with 32A, 120V contactors; a 4-contactor version, also with 32A, 120V contactors; and a single-contactor version, in this case with an 80A, 120V contactor. These configurations are designed to simplify the process of controlling circuits in different electric panels that might not be adjacent to each other. Each contactor has 3 poles and can be used to control one 3-phase or three single phase circuits. A single contactor can be tied a single pilot relay, or zone, in the controller panel, allowing 3 circuits to be controlled by each zone. Alternatively, as will be described later, the contactors can be daisy chained to allow essentially an unlimited number of circuits to be controlled by a single zone. This may make sense, for example, in a situation where there are a large number of lighting circuits to be controlled

The SiteSage Controller connects wirelessly to the SiteSage *Gateway*, which in turn connects to the broadband infrastructure in the facility. Installation of the Gateway is covered in the SiteSage Install Guide, and the Gateway will most likely have been installed prior to the installation of the SiteSage Controller. Nevertheless, Gateway installation procedures are repeated in Appendix C. Networking requirements are included in Appendix D. Circuit diagrams for the components of the Controller are included in Appendix E.

## 2. Installing the SiteSage Controller

### Step 1: Mounting the Controller Enclosure on the Wall

There are mounting tabs at each corner of the SiteSage Controller for mounting on the wall. Where there are existing contactors, mount the Controller as close to the existing contactor box as possible to minimize the connecting wire run. Where new contactors are being installed, mount the controller in the most convenient location given the number of contactor boxes being used and the number and locations of the electrical panels they are to be associated with.

### Step 2: Powering the SiteSage Controller and the Pilot Relays

The SiteSage Controller's control pod ("cPod"), needs to be powered from a 15A or 20A breaker. Follow local code with respect to wire gauge for connecting wires to the SiteSage Controller, and any restrictions on doubling up breakers. You will need to punch a hole in the Controller enclosure to bring in this and all other wires.

Figure 1 shows the position of the Ground (GND), Line (L) and Neutral (N) connections in the Controller Panel.

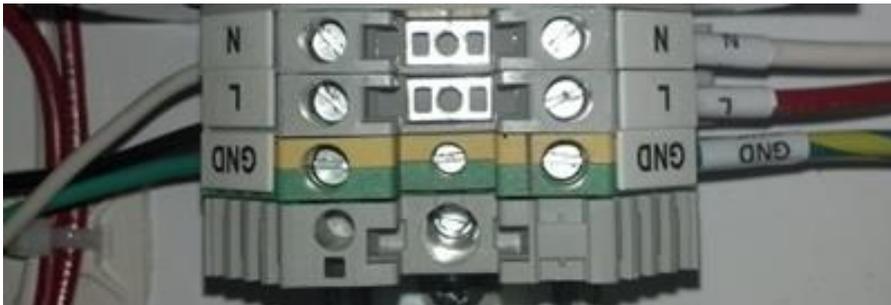


Figure 1: Controller (cPod) Power Connections

The Pilot Relays, marked Z1-Z4 in the 4 zone model and Z1-Z8 for the 8 Zone represent the zones. Each of the zones must also be connected to a dedicated 120V power source, which will be passed through the relays to energize the contactor coils.

The wire from the powering breaker should be connected to the uppermost (Common) terminal on the Pilot Relay, marked 11. To address the most common scenario, a blue jumper block is used to share the Common power across the Relays. If the neutral wires for the connected contactor coils located in different electric panels, local code may require that they be powered from different breakers. If that is the case, you can pull out or cut the jumper block as needed. Please follow local code in powering the Pilot Relays, and in the use of appropriate grounding.

### Step 3a: Connecting the Controller to Existing Contactors

Depending upon the location, you may be connecting the Controller's Pilot Relays to existing, previously installed contactors; for example, contactors installed for a mechanical lighting control system. A 4-zone Controller will have 4 Pilot Relays, labeled R1, R2, R3, and R4 while an 8-zone Controller will have 8 Pilot Relays labeled R1 through R8.

Please use the following terminals to connect to and power different types of contactors:

- For electrically held, normally opened (NO) contactors, use the middle terminal, marked 14 (which may also be referred to as NO).
- For mechanically latched (ML) contactors, connect both the middle and lower terminals, 14 (NO) and 12 (which may also be referred to as NC). It will be easier to connect the lower terminal first.
- NOTE: electrically held, normally closed (NC) contactors are not natively supported by the Controller at this time.

These terminals are shown in Figure 2.



Figure 2 – Pilot Relay Terminal

The neutral wire from the contactors should already be in place, so there should be no need to run a new one.

Inside the Controller are 2 Worksheets. The Worksheet in the plastic pouch, referred to as the *Schedule*, should be filled out and placed back in the plastic pouch so that it can be readily seen. All that is required is to fill out the electric panel name and circuit for the panels powering the Controller and each Pilot Relay; a name for the Controller Zone (which may already be labeled for the contactor being connected); and the wire terminal(s) you have used (i.e. 14, 12, or both)

for each. If there is no existing label for the contactor(s) you are attaching to a zone, please check to see what circuits the contactor controls and create an appropriate zone name.

The second Worksheet requests similar information, along with the Serial # of the Controller, which you will find inside the Controller door. This Worksheet is to be given to whomever will be doing the on-line configuration.

### **Step 3b: Connecting the Controller to New Contactors**

If you are connecting the Controller to *new* contactors that have been included with the system, you will first need to mount the provided contactor box(es) on the wall. These panels also have mounting holes to enable them to be mounted.

The Pilot Relays connect to new contactors in the exact same way as they do to existing contactors. All new contactors provided with the system are Normally Open, so please use the middle port, marked 14.

There are 2 different ways in which circuits can be connected to the Controller. In the first approach, each Controller Zone is limited to up to 3 circuits. In the second case, the contactors can be daisy chained together to allow for an almost unlimited number of circuits per zone.

For the former approach, connect the Pilot Relay to the coil terminal marked A-1 on the contactor. Port A-2 is to be connected back to the neutral bar in the electric panel that powers the Pilot Relay. Generally, the easiest way to do this is to use the same conduits used to connect that panel to the Controller, and the Controller to the Contactor box. Alternatively you can wire directly from A-2 to the powering electric panel.

To daisy chain the contactors, connect the Pilot Relay to terminal A-1 on one of the contactors, and run another wire from this terminal A-1 to terminal A-1 on the next contactor to be controlled by the zone. There is theoretically no limit on the number of contactors that can be connected to the same zone using this approach.

Figure-3 shows a two Contactor box with the A1 and A2 terminals daisy chained together.



**Figure- 3 Daisy Chained Remote Contactors**

#### **Step 4: Connecting New Contactors to the Circuits to be Controlled**

As noted earlier, there are 3 contactor configurations that can have been provided: a panel containing a single contactor rated for 80 amps (intended for heavy loads); a panel with two 32A contactors; and a panel with 4 32A contactors. You may have been provided with more than 1 of these panels. Mount the panel(s) as close as possible to the electric panels which contain the circuits that contactor panel will be controlling.

With new contactors, additional information is required on the larger Worksheet. Specifically, please enter the name of the electric panel containing each circuit to be controlled, along with the breaker, as well as the name of the circuit. A sample of a completed worksheet is provided in Figure 4 below.

*If more than 3 circuits are being controlled by a zone, feel free to name more than 1 circuit on a row, or cross out the pre-filled zone numbers to be able to use more rows for the same zone and use multiple Worksheets to fit in all circuits.*

## SiteSage Controller Setup Worksheet

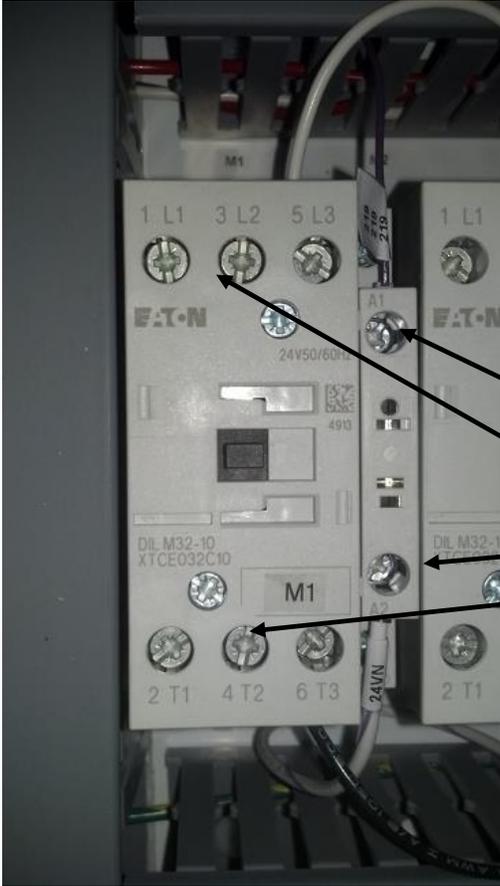
Location: WALTHAM Controller Name: C-1  
 Serial # CP1A1 Panel Powering Controller LIGHTING 15

Zone	Panel Powering Zone	Breaker Number	Control Zone Name	Circuit/Contactor Label	Panel Powering Circuit	Breaker Number
z1	LIGHTING	16	POLE LIGHTS	POLE 1	LIGHTING	21
				POLE 2	"	22
					"	
z2	LIGHTING	16	DINING LIGHTS	DR FRONT	LIGHTING	31
				DR MIDDLE	"	33
				DR BACK	"	35
z3	LIGHTING	17	HOOD EXHAUST	EXHAUST 1	SUB 1	3
				EXHAUST 2	"	5

Figure 4: Configuration Worksheet

### Connecting the Line (Hot) side of the contactors to the breakers being controlled

First, disconnect the breakers for the circuits to be controlled. Run a wire from each of these breakers to one of the contactors, using the L1/L2/L3 (Line) ports for the 3 circuits to be controlled by a zone. (Note: in some cases there may only be 1 or 2 circuits to be included in a zone). The contactors are rated for 32A (80A in the case of the single contactor box), and the appropriate wire gauge must be used. A #2 Phillips screwdriver should be used and the wires should be torqued to 26.6 lb in.



**1. Connecting the Load side of the contactors to the branch circuits**

Run wires from the loads being controlled in the electric panel to the appropriate contactor, using the T1/T2/T3 ports.

The 2 sets of contactor terminals are shown in Figure 4 on the left, along with terminal A-1 and A-2 noted earlier

L1, L2, L3

A-1/A-2

T1, T2, T3

**Figure 4: Contactor Connections**

## Appendix A: Controller Channel Configuration

Before the SiteSage Controller can be used to establish on/off schedules, it must be configured. This is very similar to the process for configuring SiteSage Energy Monitor channels.

When you log into the SiteSage Portal Facility View for a location that has had a new Controller installed you will see a message

that a Controller has been discovered and needs to be configured. The link will take you to the Controller Configuration page shown here (filled out), which otherwise can be found under Settings/Smart Controls. This form needs to be completed using the information on the Controller Set-up Worksheet.

As with the Energy Monitor Channel Configuration page, there is some basic information to enter at the top of the page. Clicking on any row will bring up a dialog box to be used to enter the information about the circuits (or existing contactors) connected to each Control Zone, labeled Z1, Z2, etc. The information requested includes: the name and breaker # of the Breaker Panel powering the Zone (which will generally be the same for all Zones); an indication of whether the Controller is being used with a new or existing contactor panel; if the former an indication of whether the Breaker panel being controlled is being monitored for energy use and the name of the monitor (or a name for the Panel if not); the breaker # and label (name) of the circuits being controlled (or contactors if the Controller is being used with an existing contactor panel); if a circuit is being monitored, the SiteSage Energy Monitor Channel number; and a name for the Zone.

**Controller Channels Configuration**

Controller:  [Rename](#) Serial Number: CP1A1 000002 0800 Status: Auto

Panel Powering Controller:  Breaker:

Zone	Panel Powering Zone	Breaker	Control Zone Name	Sensor?	Circuit/Contactor Label	Breaker Panel	Breaker Number	SiteSage Monitor Channel
Z1	Main	21	Misc Refrigeration		Refrigerated Table (Pizza) Bar line system condenser Walk-in cooler / Freezer lights	Panel A2 Panel A2 Panel A2	10 16 18	B-2 B-5 B-6
Z2	Main	21	Outdoor Lighting		Outdoor Pole 1 Outdoor Pole 2 Sign	Lighting Panel Lighting Panel Lighting Panel	3 5 7	
Z3	Main	21	Exhaust Hood		Exhaust Hood 1 Exhaust Hood 1 Exhaust Hood 1	Main panel Main panel Main panel	11 13 15	
Z4	Main	21	Dining Room Lights		Dining Room Lights Dining Room Lights Dining Room Lights	Lighting Panel Lighting Panel Lighting Panel	14 16 12	B-2

**Controller Channel (Z1) Properties**

In Use?

Powering Panel:  Breaker:

Controlling:  Breaker Panel  Existing Contactor Panel

Breaker Panel:  Monitored:    
 Unmonitored:

Breakers: Number Circuit Label Monitored Channel

10	Refrigerated Table (Pizza)	B-2
16	Bar line system condenser	B-5
18	Walk-in cooler / Freezer lights	B-6

[Add Another Circuit](#)

Control Zone Name:

The dialog box defaults to 3 circuits or controllers per zone, but additional circuits can be added by clicking on Add Another Circuit.

Once this information has been entered for each Zone and corresponding circuit or contactor, the Controller will be ready to for setting schedules.

## Appendix B: SiteSage Controller Maintenance

It is recommended that the following be performed semi-annually to ensure proper operation.

Be sure ALL electrical connections are tightened to the manufacturer's suggested torque ratings (See chart below). Check components for any visual damage, replace if necessary. Be sure all/any finger safe covers are in place before unit is put back into operation.

Recommended Torque settings for components:

Component	Manufacturer	Part Number	Recommended Torque
Contactors	Eaton	XTCE032C10T	26.6 lb in.
Circuit Breaker	Allen Bradley	1492-SPM2D010	17.7 lb in.
Transformer	Cutler Hammer	C0100E1B	N/A
NO Contact Block	Allen Bradley	800F-X10	6 lb in.
Terminal	Allen Bradley	1492-JD3	9.0 lb in.

## Appendix C: Setting up the SiteSage Gateway

The core of the system is the *SiteSage Gateway*. All other SiteSage hardware components connect to the Gateway, either wired or wirelessly. The Gateway then connects to the broadband infrastructure in the facility, either via Ethernet or Wi-Fi, and provides the connection to the *SiteSage Portal*. It uploads data on a minute by minute basis and brings back new settings or commands. It is a small device (5.25" x 3.25" x 1.5") that can be mounted on the wall or placed on a table, ideally within about 30 feet of the electric panels it is connecting to. Multiple Gateways may be required, either because of distance constraints or device number constraints. (A single Gateway can connect to at most 10 electric panels).

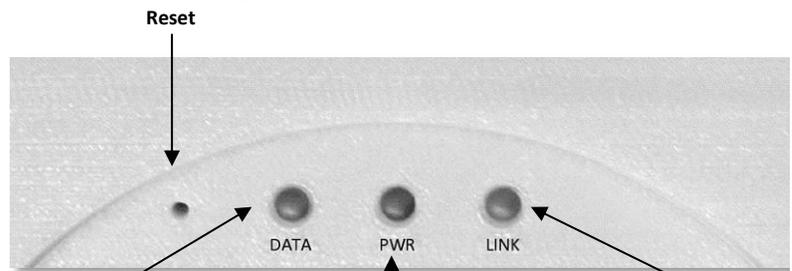
Best practice is to install the Gateway first, although that is not a requirement.

NOTE: The Gateway connects all of the SiteSage components to the Internet. If the Gateway gets unplugged, the SiteSage Energy Monitors, Smart Thermostats, and other sensors will no longer upload data (although they will collect and store the data – in the case of energy data for up to 20 days - and the SiteSage controls will no longer accept settings changes. *To ensure uninterrupted operation please make sure to install the Gateway in a place where it is not likely to be accidentally unplugged.* Please note that the system cannot be registered until the Gateway is connected to the Internet.

### C.1 Installing the SiteSage Gateway

Physically installing SiteSage Gateway is extremely simple. You can hang it on the wall with the brackets provided, or place it on a table. Find a location within approximately 30 feet of the electric panel(s) in which you will be installing SiteSage Energy Monitors, and near a 120 volt power outlet. Attach the Power Supply to the Gateway and plug it in to the wall outlet. **NOTE:** If there are multiple electric panels that are not close together, you may need additional Gateways.

There are 3 LED status lights on the Gateway. When the Gateway powers on, the middle one, marked **PWR**, should show solid green, indicating that the Gateway is drawing power. The other LED's will flash 3 times,



**DATA.** Turns solid green once at least 1 SiteSage is successfully communicating

**PWR.** Stays solid green when Gateway is powered

**LINK.** Stays solid green when Gateway is connected to Internet

pause, and then go solid for about 2 seconds. If the Gateway has been configured with Wi-Fi, the LEDs should flash green. If it was configured for Ethernet, they flash red. (If you do a factory reset, as described later, the final flash will be orange). Subsequently, the LED on the left, marked **DATA**, will turn red for 2 seconds when a SiteSage Controller or Energy Monitor is trying to pair with the Gateway. SiteSage will not be able to successfully communicate until the Gateway has been connected to the Internet<sup>1</sup>.

**NOTE:** *You cannot pair a Gateway with a SiteSage Controller or Energy Monitor until it is connected to the Internet. When a Gateway is activated and connected to the Internet, any unpaired but configured SiteSage Monitors in range should find it and try to pair with it. If there are multiple Gateways, a Controller or Monitor will try to connect to the one with the best signal. (If it ever resets or loses communications it will again look for the best signal when it comes back on-line). You can force an assignment to a different Gateway (on the Settings/Channels page on the SiteSage Portal), but that is not recommended.*

## C.2 Connecting to the Internet

The SiteSage Gateway is designed to transmit data in near-real time over the Internet to the SiteSage Servers, where data is analyzed and presented on the SiteSage Portal (described in the SiteSage User Manual, which is accessible on-line via the Support link of the SiteSage Portal. *Please see Appendix D for system network requirements.*

The Gateway connects to a network in one of 2 ways; hard-wired Ethernet or Wi-Fi. Currently the Gateway needs to be pre-configured for one or the other, although it is possible to change the configuration remotely as long as the Gateway is connected. (Future versions of the Gateway will support Ethernet and Wi-Fi simultaneously). If you have multiple Gateways, it is possible to use Ethernet with some and Wi-Fi on others. *Please note that SiteSage needs Internet access only, and should be installed outside the firewall.*

If you are using Ethernet, simply connect the Gateway's Ethernet port to an Ethernet connection using a standard Ethernet cable. (If there are no Ethernet ports near the Gateway, you can use a power line bridge). This is all you need to do unless a static IP address or proxy

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<sup>1</sup> The Gateway also has 6 ports marked A1-A3 (analog ports) and D1-D3 (digital ports). These are for connecting other sensors and devices, such as temperature sensors and water meters. Appendix D describes current support for temperature sensors.

server is required for the facility, as described below. In that case, follow the instructions under Step 2.

Many corporate networks will have security settings that do not easily allow systems to be added to the network, so it may be necessary to have the system pre-provisioned, by providing the Gateway's MAC address to the corporate network support group in advance. (Please see Appendix C for more information on network provisioning).

Alternatively, the SiteSage Gateway includes a Wi-Fi radio. If Wi-Fi is being used as the connection method, follow the instructions below. (If you are not sure which connection method was specified, check the Gateway; it should have a Wi-Fi or Ethernet label).

If you need to change a Gateway from Ethernet to Wi-Fi, or vice versa, contact SiteSage Support (support@sitesage.net). As long as the Gateway can be connected to the Internet, new firmware can be downloaded to change the connection method. (When new connection firmware is downloaded you will be disconnected from the Internet and need to re-connect using the newly downloaded protocol).

Please note that using a public Wi-Fi network is not recommended. Often these systems will have certain restrictions that may make it difficult to keep SiteSage connected at all times. Also, SiteSage has no way to acknowledge acceptance of terms. Wi-Fi networks may also require pre-provisioning, as described in Appendix C.

## STEP 1 (Wi-Fi only)

When the Gateway turns on, it will create its own (ad hoc) Wi-Fi network. When the ad hoc mode is established, the LINK light will alternatively flash red/green for 5 seconds. Using a PC, Mac, iPhone, or other device that connects to Wi-Fi networks<sup>2</sup>, follow the standard process for identifying nearby networks. (Note: there does not need to be a Wi-Fi network in the facility to see the Gateway's ad hoc network).

Find the network with a name like eMonGatwy-xxxxx (these are the last 6 digits of the MAC address of the Gateway, which can be found on the Gateway label), and connect to it. If your computer displays an "unsecured network" message, click "**Connect Anyway**" and continue connecting to



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<sup>2</sup> Android no longer supports a native connection to ad hoc networks. You may be able to download a utility that will let you connect. There may also be issues with Windows 8.1 and again utilities are available.

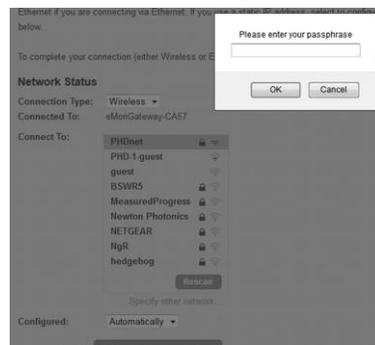
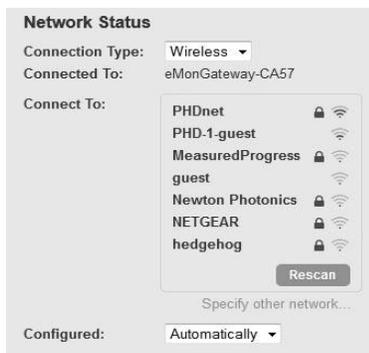
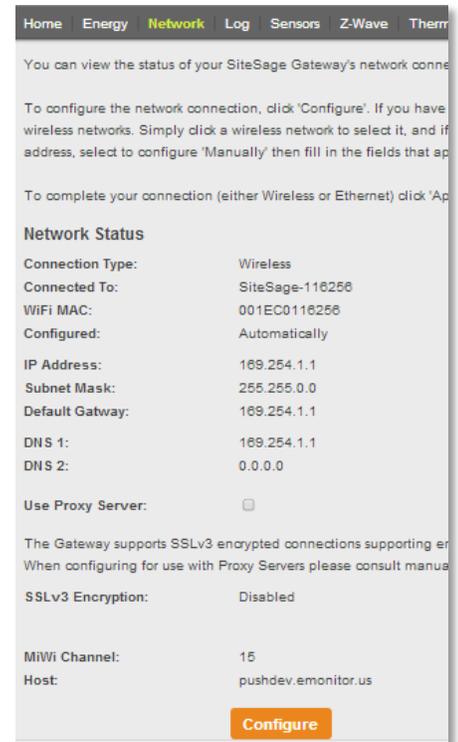
the Gateway. If the connection was successful, **Connected to eMonGatwy-xxxxxx** will be displayed.

If you were unable to connect to the Gateway, try the process again. If you still cannot find the network, do a (hard) factory reset of the Gateway (as described on Page 10) and try again.

## STEP 2 (Wi-Fi; Ethernet for Proxy Server and Static Address)

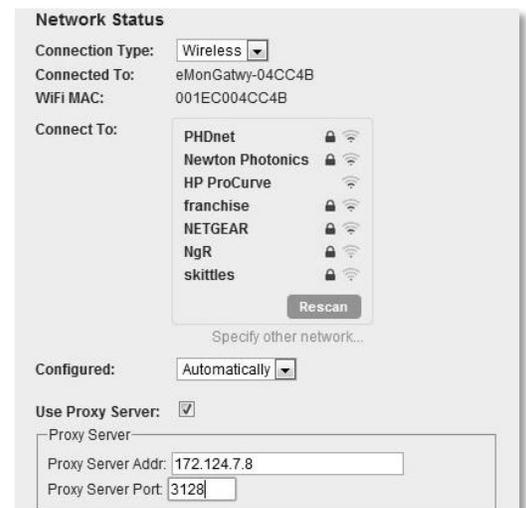
Enter the address **http://169.254.1.1/netcfg.htm** in a browser window. The page shown to the right which is part of the SiteSage Embedded Web Server, will load. Press **Configure** and the page will change to let you set your configuration parameters.

*If you are using DHCP, where an IP address is automatically selected, select **Automatically** as the configuration method. You will see a list of available wireless networks displayed in the window. Click on the facility's Wi-Fi network to select it. If the network is password protected, enter the Password. Click **Apply Network Settings** and the Gateway will be connected to the network. It may take 30 seconds or more for the **LINK** light to turn green to signify that it is connected, so please be patient.*



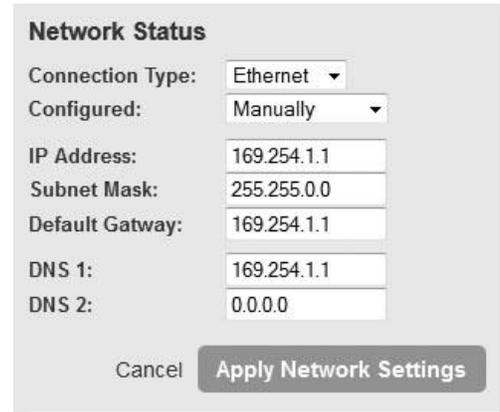
If you need to attach via a Proxy Server, enter the server address and port on the Configuration page.

If you want to view or change the settings for any reason, or simply get back to the Embedded Web Server, you must first determine the Gateway's IP address. If you have already registered the system, log into the SiteSage Portal and go to *Settings/Channels*. You will see a link called *Gateway Assignment*. Follow that link and you will see the current IP



address of the Gateway. If you have not yet registered and configured this location (but the account has already been established), go to [Sitesage.net/setup](http://Sitesage.net/setup), log in, and enter the Gateway's Serial # (found on the back of the Gateway), which will return the then current IP address. (Registration and Configuration is described in Section 5). At any time you can also find the IP address by looking at the router's list of DHCP entries (using the MAC address of the Gateway that is on the label).

*If you want to use a static IP address, select Manual for the configuration method. (It will default to Automatic). You will be asked for the Static IP Address, Subnet Mask, Default Gateway and DNS1 and DNS2 (optional). Then hit Apply Network Settings.*



Network Status	
Connection Type:	Ethernet
Configured:	Manually
IP Address:	169.254.1.1
Subnet Mask:	255.255.0.0
Default Gateway:	169.254.1.1
DNS 1:	169.254.1.1
DNS 2:	0.0.0.0
Cancel Apply Network Settings	

***If you have connected via Ethernet and want to set a static IP address or connect to a proxy server,*** connect your laptop to the Gateway's Ethernet port and enter the address <http://169.254.1.1> in your browser. (Make sure to disable any cellular or Wi-Fi networks on your laptop). You will see the same screens you see here, with Ethernet as the Connection type. Follow the instructions above to set a static IP address or connect to a Proxy Server. If you set a static address, you can reconnect to the Gateway at a later date by entering that address directly.

When the Gateway successfully connects to the facility network, the **LINK** light will turn and remain solid green, other than a flash of orange once per minute as data is transmitted. (If you see solid orange for about 10 seconds that means the Gateway is downloading new firmware; both the **LINK** and **DATA** lights will flash red while the firmware is being loaded). Unpaired but registered SiteSage Controllers or Energy Monitors will immediately attempt to connect to the Gateway and upload data; both the **DATA** and **LINK** lights on the Gateway will show solid orange for a couple of seconds. (This will be repeated whenever data is uploaded or downloaded). When a SiteSage Controller or Energy Monitor has successfully paired with the Gateway, the **DATA** light will turn solid green. If you installed the Gateway first, as described here, the DATA light will not do anything until a SiteSage Energy Monitor unit has been installed and configured.

If there is an error in the setup process, or the network connection fails for any reason, the **LINK** light will not turn green. This may happen because you did not enter the security password correctly, or if the connection was momentarily lost. If it becomes clear that the Gateway is not connected to the internet, you will need to repeat the steps starting from STEP 1.

To do this, you will first need **to do a hard (factory) reset of the Gateway**. **Press Reset**. (Use a paper clip and pull it out quickly). The **DATA** and **LINK** LEDs will flash 5 times, and then turn solid for 2 seconds. **Press Reset again (quickly) while the light is solid** and the Gateway should reset to its factory settings. The LEDs will display orange for about 2 seconds when the **factory reset** is successful.

### **STEP 3**

When the SiteSage Gateway Internet connection is completed successfully, make sure your computer has re-connected to the facility network if you are going to be using it to register the system. If it hasn't, go back to your network connections screen to re-connect to the network.

Once the Gateway has successfully been connected to the Internet and Energy Monitor units have been installed and configured, if the **DATA** light is not solid green, it has not successfully paired with any SiteSage Controllers or Energy Monitors. Try moving the Gateway closer to electric panel. If that does not work, try power cycling the Controller or Energy Monitor, by flipping the breaker for the circuit that powers it. If that does not work, try power cycling the Gateway (which will then need to be reconnected to the Internet). If neither of these works, please contact SiteSage support.

## Appendix D: SiteSage Networking Requirements

SiteSage Controllers and Energy Monitor units communicate via a wireless radio to the SiteSage Gateway. The radios have a range of at least 30 feet and do not require line of sight. The Gateway needs to be connected to a facility network in order to access the Internet to upload data to the SiteSage cloud-based servers. Depending upon the location of the electrical panels, it is conceivable that there will need to be more than one Gateway installed.

The SiteSage Gateway is a “headless” device which can be connected through hardwired Ethernet or Wi-Fi (B or G only). It only requires Port 80 to be open, and only makes *outgoing* HTTP requests to the SiteSage servers. There is no way to communicate with the Gateway from the Internet, other than through the responses to the HTTP request.

**Ethernet Connection** (the clear preference is to use Ethernet wherever possible in order to maximize reliability).

Normally, the SiteSage Gateway requires DHCP in order to connect to the network. If DHCP is not used in the facility, a static IP address can be provisioned, but the Gateway must first be attached to the network using DHCP. If a DHCP server is not available in the facility, it is possible to provision the system on another network that has DHCP and then move it to the destination network. The system can connect to an HTTP proxy server; to configure for a proxy server we will need to know the IP address or URL and port number.

If a static IP address is required, we will need to know, in advance, the following information:

- IP Address
- Network Mask
- Gateway IP Address
- DNS Server IP Address
- DNS Server2 IP Address (Optional)

If MAC level filtering is enabled on the network we can provide the Ethernet MAC address in advance, if required. If there is a restriction to a specific port, we will need to know which port on the switch to attach to. (In the event that the Gateway is not connecting directly to the switch, we will need to coordinate on the installation).

### **Wi-Fi Connection**

If Wi-Fi is required, the preference is a secured connection. The Gateway needs to be connected to a network that is up 24 X 7 and does not limit users' connection time. Because the system is headless, there is no way to accept terms or respond to a prompt. If the standard public network in the facility has any such restrictions that can be overridden, the Wi-Fi MAC address can be provided in advance to allow the system to be pre-provisioned.

The system supports both WEP and WPA security. In a Wi-Fi configuration, the following information is required:

- SSID (Name and whether or not it is broadcast)
- Encryption Type (WEP/WPA/WPA2/etc.)
- Encryption Key/Pass Phrase **(NOTE: if these are regularly changed, please provide notification in advance of the new key, along with the planned date and time of change, on an ongoing basis).**

The system can also support a static IP address on a Wi-Fi network; in this case the system can be provisioned locally even where no DHCP server is available. The same information as requested above for an Ethernet connection is required. If a proxy service is used, the IP address or URL and port number must be provided.

NOTE: The optional Wi-Fi smart thermostat does not have an Ethernet option. *Peer-to-peer access must be enabled for SiteSage to be able to connect to the Wi-Fi thermostat.* If the Gateway is sharing a public Wi-Fi network, where peer-to-peer access is not advisable, please set up a separate SSID for SiteSage Gateway. The SiteSage Z-Wave thermostat connects directly to the Gateway and requires no access to the facility network.

For each facility in which SiteSage will be installed, please answer the questions on the following page in order to facilitate the network installation process.

## SiteSage Networking Questionnaire

Company: \_\_\_\_\_ Facility Name/Location: \_\_\_\_\_

Preferred Network Connection: Ethernet \_\_\_ Wi-Fi \_\_\_

If Wi-Fi: SSID \_\_\_\_\_ Broadcast? Yes \_\_\_ No \_\_\_

Encryption Type \_\_\_\_\_

Pass Phrase \_\_\_\_\_

Do you regularly change the Password? Yes \_\_\_ No \_\_\_

Peer to Peer Access Enabled? Yes \_\_\_ No \_\_\_

Do you have a DHCP Server Available? Yes \_\_\_ No \_\_\_

Static IP Address Required? Yes \_\_\_ No \_\_\_

If so: IP Address \_\_\_\_\_

Network Mask \_\_\_\_\_

Gateway IP Address \_\_\_\_\_

DNS Server IP Address \_\_\_\_\_

DNS Server2 IP Address \_\_\_\_\_ (optional)

If a Proxy Server is used: IP Address/URL \_\_\_\_\_ Port #: \_\_\_\_\_

Do we need to provide the MAC address(es) in advance of installation? Yes \_\_\_ No \_\_\_

Do you apply content filtering on your network? If so, we need to provide you with content samples so that you can configure such that our data will not be caught in the filter. Yes \_\_\_ No \_\_\_

### IT Support Contact Information:

Name: \_\_\_\_\_

Phone: \_\_\_\_\_

e-Mail Address: \_\_\_\_\_

## Appendix E: SiteSage Controller Technical Specifications

SiteSage Specifications	
<b>Controller Connections</b>	<b>Controller Contactors/Relays</b>
<ul style="list-style-type: none"> <li>· Up to 8 control zones</li> <li>· Works with existing or new contactors</li> <li>· 1 timed emergency override switch port</li> </ul>	<ul style="list-style-type: none"> <li>· 4 or 8 120V Pilot Relays</li> <li>· 32A 3-phase contactors; 120v-300MA coil rating (80A avail.)</li> </ul>
<b>Communication Protocol</b>	<b>Environmental Specifications</b>
<ul style="list-style-type: none"> <li>· MiWi Wireless (802.15.4) 2.4Ghz connection to SiteSage Gateway</li> </ul>	<ul style="list-style-type: none"> <li>· Controller Panel W x H x D: 14" x 15.5" x 8"; Weight 17 lb.</li> <li>· Contactor (4) panel: W x H x D: 8.5" x 11.5" x 5.5"; Weight 8 lbs.</li> </ul>
<b>Power Requirements</b>	
<ul style="list-style-type: none"> <li>· 120V AC, 50/60 Hz 1.5W</li> </ul>	<ul style="list-style-type: none"> <li>· Operating Temperature -10° C to + 60° C (14o F to 140o F)</li> <li>· Humidity 5% to 95%, 95% non-condensing</li> </ul>
<b>Gateway Connections</b>	<b>Gateway Power Requirements</b>
<ul style="list-style-type: none"> <li>· 1 x 10/100 RJ-45 Ethernet Port</li> <li>· 1 x High Speed RJ11 or RS485 Serial Port</li> <li>· 3 Analog Inputs – wire pair - +/- 2V; 3 Digital Input/Outputs</li> <li>· USNAP 2.0 Modular Connector</li> </ul>	<ul style="list-style-type: none"> <li>· 120VAC Power, 60 Hz</li> </ul>
	<b>Environmental Specifications</b>
	<ul style="list-style-type: none"> <li>· L x H X W: 5.25" x 3.25" X 1.5"; Weight = 6 oz.</li> <li>· Operating Temperature -10° C to + 60° or 14° F to 140° F</li> <li>· Humidity 5% to 95%, non-condensing</li> </ul>
<b>Communication Protocols</b>	<b>Wired Protocols Directly Supported</b>
<ul style="list-style-type: none"> <li>· TCP-IP via Ethernet (802.3) 10/100base-T</li> <li>· Wi-Fi (802.11/b/g/n); MiWi Wireless (802.15.4) 2.4GHz</li> <li>· Local via High Speed Serial Port</li> <li>· Z-Wave<sup>(R)</sup> mesh networking (optional USNAP module)</li> </ul>	<ul style="list-style-type: none"> <li>- 1-Wire; Modbus; Pulse Counter</li> </ul>



## Warnings



**Water and Moisture** – Do not use or install the hardware near water – for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool and the like.

Do not place the hardware on an unstable cart, stand, tripod, bracket, or table. Any mounting of the product should follow the manufacturer's instructions.

**Power Sources** – This product should be operated only from the type of power source indicated on the marking label or in this Installation Guide. If you are not sure of the type of power supply in your facility, consult your authorized SiteSage Channel Partner.

**Grounding or Polarization** – This product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

**Power-Cord Protection** – Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

**Lightning** – For added protection for this product during a lightning storm, unplug it from the wall outlet. This will prevent damage to the product due to lightning surges.

**Overloading** – Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.

**Object and Liquid Entry** – Never push objects of any kind into this product through openings (if any) as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

**Servicing** – Refer all servicing to qualified service personnel.

**Damage Requiring Service** – Refer servicing to qualified service personnel under the following conditions:

- If liquid has been spilled, or objects have fallen into the product.
- If the product has been exposed to rain or water.
- If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive (and expensive) work by a qualified technician to restore the product to its normal operation.
- If the product has been dropped or damaged in any way.

**Replacement Parts** – When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer. Unauthorized substitutions may result in fire, electric shock, or other hazards and voiding of warranties.

**Safety Check** – Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

**Heat** – The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products that produce heat.

## Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are design to provide reasonable protection against harmful interference in an installation. The equipment generates, uses and can radiate radio frequency energy and, if not installed according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment on and off, please check with your Authorized SiteSage Channel Partner or a qualified technician.

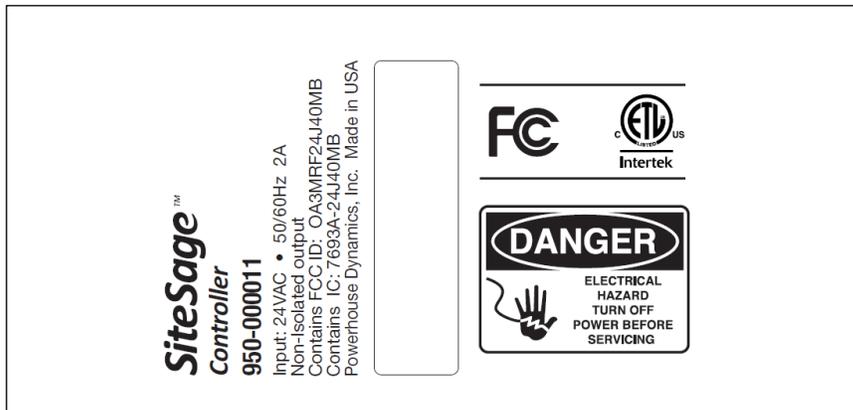
### Declaration of Conformity

SiteSage complies with part 15 of the FCC rules. Operation is subject to the following conditions:

- The devices may not cause harmful interference, and
- The devices must accept any interference received, including interference that may cause undesired operation.

### Declaration of Conformity:

#### FCC Class B approval



### FCC Caution

Shielded interconnect cables and a shielded AC power cable must be employed with this equipment to ensure compliance with the pertinent RF emission limits governing the device.

Any changes or modifications not expressly approved by Powerhouse Dynamics could void your authority to operate the equipment.

Do not co-locate or use with other devices that contain antennas.

## **Power Safety**

**Only use the supplied power cords.**

**Do not place anything on the power cord. Place the Power Cord where it will not be in the way of foot traffic.**

## **FCC Radiation Exposure Statement**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. Do not maintain equipment within 20cm of your body.

## **Warranty**

Powerhouse Dynamics warrants SiteSage hardware against defects in materials and workmanship for a period of two (2) years from the date of installation. (SiteSage accessories, provided by 3<sup>rd</sup> parties, such as thermostats, are warranted for 1 year from purchase as per the manufacturer warranty). During the warranty period Powerhouse Dynamics will repair or replace any defective product at no charge. The defective product must be returned to Powerhouse Dynamics and properly packed before shipping unless arrangements are made for advance replacement. Powerhouse Dynamics is not responsible for removal or reinstallation after the first 30 days.

This Warranty does not cover damage from accident, misuse or abuse, incorrect installation, installation at environmental conditions outside the specifications, lack of reasonable care, non-approved repair services, or the fixing of any attachment that did not come with the product or is not specifically authorized by Powerhouse Dynamics. This Warranty is invalidated if the unit is transferred from its original owner to another location.

THE FOREGOING EXPRESS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. UNDER NO CIRCUMSTANCES WILL POWERHOUSE DYNAMICS BE RESPONSIBLE FOR ANY INDIRECT, CONSEQUENTIAL, SPECIAL OR INCIDENTAL DAMAGES, OR PROPERTY LOSS OR INJURY.