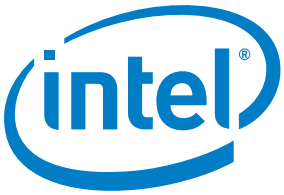

# Intel® Building Management Platform (Intel® BMP)

## Installation Guide

*December 2016*

Order Number: 334815-002US

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# Contents



# Figures



# Tables

# Revision History

| Date | Revision | Description |
|---|---|---|
| December 2016 | 002 | Updated the product name and legal disclaimers. |
| September 2016 | 001 | Initial release. |

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# 1.0 Introduction

Intel® Building Management Platform (Intel® BMP) provides a secure, easy way of connecting data from devices in buildings to cloud-based building management applications, for use in monitoring and control of energy, HVAC, occupancy, lighting, and more. For more information about Intel® BMP, go to www.intel.com/bmp.

## 1.1 Purpose

This installation guide describes how to install an Intel® BMP based gateway, connect it to the CANDI PowerTools® service, make sure that devices in the building are provisioned correctly, and check that data from devices is accessible.

## 1.2 Audience

This guide is intended for installation or service technicians.

## 1.3 Conventions

This guide uses the following text conventions:

**Table 1. Conventions**

| Text | Example with Attributes |
|---|---|
| **Bold text** for user interface names of tabs, dialog boxes, or buttons | Click **Next**. |

## 1.4 Terminology

This guide uses the following terms:

**Table 2. Terminology**

| Term | Description |
|---|---|
| Device | A device is any piece of equipment that is installed to be monitored or controlled in a building. Examples of devices include light switches, thermostats, cameras, other mechanical loads, and sensors and gauges.<br><br>***Note:*** In this document, gateways are always called gateways even though they are also technically devices. |
| Gateway | A gateway is hardware that can physically (wirelessly or wired) connect different devices in a building to a common network.<br><br>The gateway referenced in this guide is the Advantech* UTX-3115 gateway. |
| Intel® BMP | Intel® Building Management Platform is software that acquires device data (using various device protocols) and then forwards the data over a network to the cloud. It also helps protect the gateway from network cyber threats. |
| IoT | Internet of Things |
| Site | A site can be a single floor of a building, the whole building, or an entire campus of buildings. Typically you define a site as a discrete location with a physical address and a set of shared devices to be monitored and controlled.<br><br>For example, you might have one site as a tenant in a large building in New York, a second site comprising an entire building in Boston, and another site covering a campus of several buildings in Chicago. Typically one gateway handles device data for each site. |

## 1.5 Technical Support

For users with a registered product, Intel provides technical support through Intel® Premier Support. To submit a support request using Intel Premier Support, go to https://premiersupport.intel.com.

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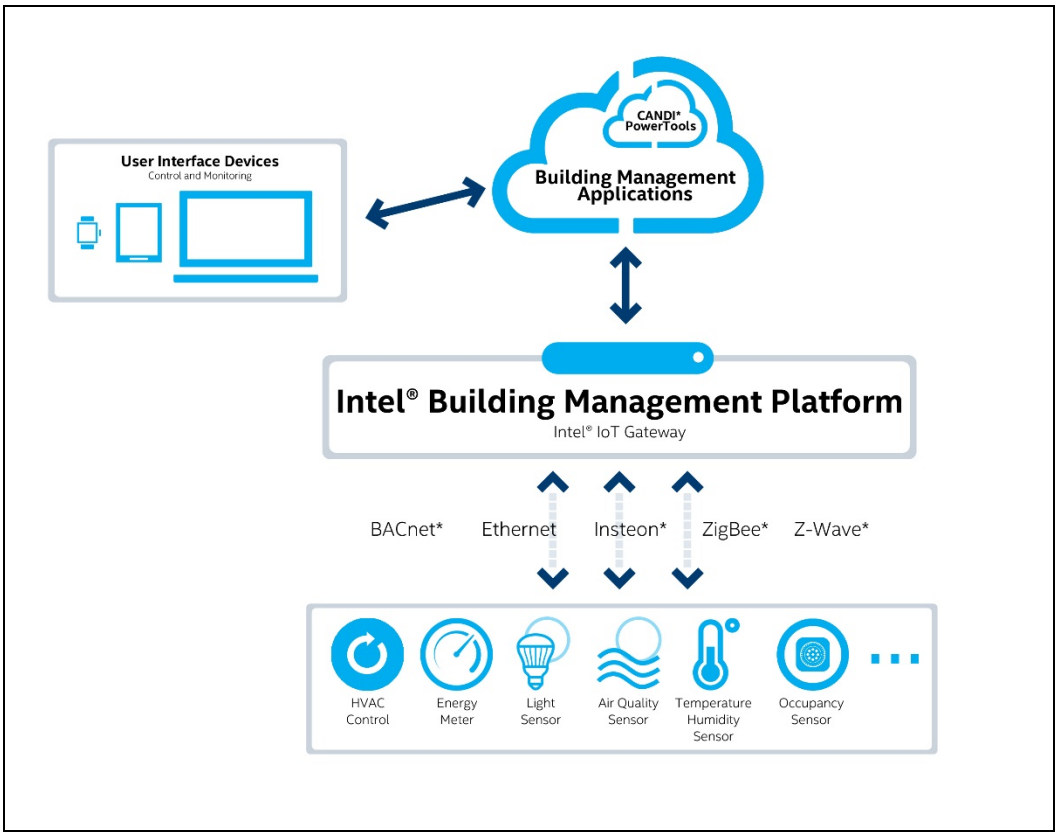
# 2.0 System Overview

To help facilities managers lower operations costs and enhance occupant experiences, Intel provides a secure, manageable, easy-to-use platform to access data and things in small and midsize buildings. The system consists of two main components:

- Intel® BMP based gateways (that is, IoT gateways pre-installed with Intel® BMP)
- A data management service, CANDI PowerTools

**Figure 1. System Overview**



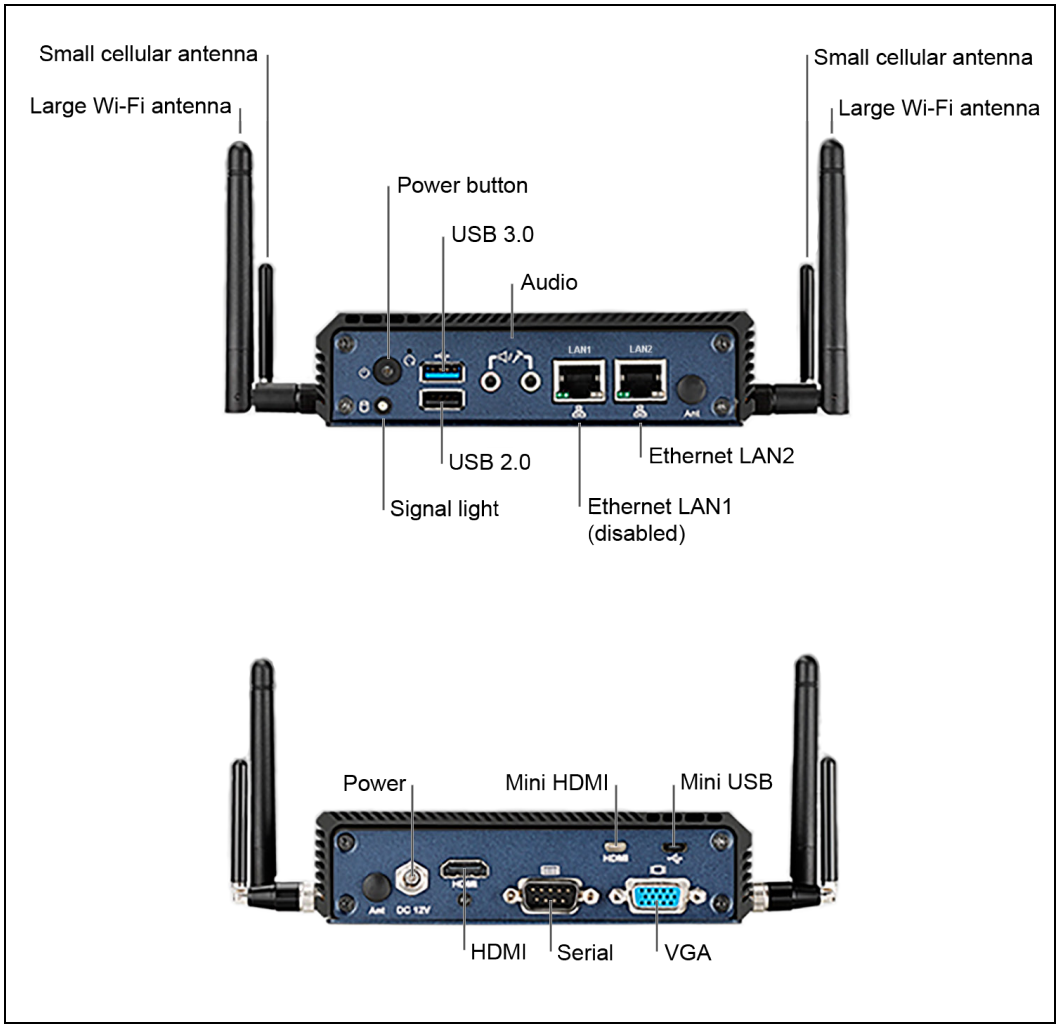

## 2.1 About the Gateway

An Intel BMP based gateway connects disparate devices in buildings across protocols and filters and securely transfers the data via a standards-based API to cloud-based services and applications for business intelligence, analytics, dashboards, and other applications. These connections can be to air handling units, chillers, thermostats, meters, lighting, sensors, and switches using standard protocols such as BACnet* and ZigBee*. A building can have one or more gateways, and the gateways can connect to one or more devices.

### 2.1.1 Gateway Features

The gateway has the following features:

**Figure 2. Gateway Features**



## 2.2 Supported Devices

Intel BMP with PowerTools can integrate and normalize data communications from a variety of devices. Natively, the gateway supports communications over the local Ethernet network to many popular IP-enabled devices, including BACnet* MS/TP. To communicate on other local device networks such as ZigBee*, Modbus*, XBee*, Z-Wave*, and Insteon*, a network bridge (such as a radio-to-USB dongle) must be added. For a list of supported devices and network bridges, see www.intel.com/bmp.

## 2.3 About PowerTools

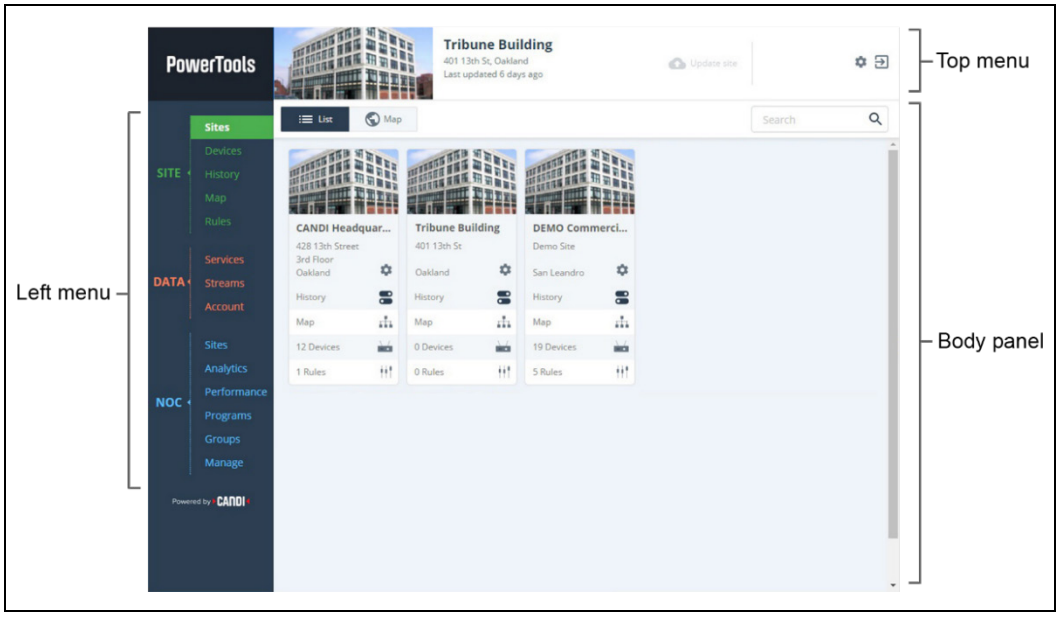
PowerTools is a Software-as-a-Service (SaaS) application that enables users to connect and manage gateways and devices in buildings. As data flows from devices through the Intel BMP based gateway to the cloud, PowerTools provides the ability to monitor and control the devices in real time. You can, for example, see how much power an HVAC system is using or watch the video feed from a security camera. You can also use PowerTools to remotely control some devices, such as thermostats and lighting systems. With PowerTools, you can manage devices and data at multiple sites all from a central dashboard. PowerTools is based on CANDI's API, which is available separately to develop custom applications.

### 2.3.1 About the PowerTools Dashboard

The PowerTools dashboard is the application's user interface. The dashboard is where you manage your gateways, devices, and data. On the dashboard, a "site" represents a physical address with commonly shared devices, such as a building. A site can have one gateway, and one or more devices (for example, lighting, HVAC, power meters, cameras, sensors, and thermostats).

The dashboard contains three main areas: the top menu, the left menu, and the body panel.

**Figure 3. PowerTools Dashboard**




**Top menu.** The top menu shows the currently selected site. It also provides access to your profile settings.

**Left menu.** The left menu is the entry point to site management features. From this menu, you can navigate to your sites, devices, and more.

**Body panel.** The body panel is where you manage sites and devices. The content here changes based on what you choose from the left menu or from the action bar at the top of the body panel.

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# 3.0 Gateway Installation

Gateway installation involves verifying first that device hardware on site is correctly operating, then installing and provisioning the gateway. After the devices and gateway are physically installed, you will use a computer's web browser and PowerTools to authenticate that you control the gateway and link it to a site. The final step is to connect to your devices and verify that data is flowing.

The main steps are:

1. Prepare your installation.
2. Install your gateway.
3. Log in to PowerTools.
4. Set up your devices.

## 3.1 Step 1: Prepare Your Installation

To prepare your installation, you need:

- A location to mount the gateway. Here are some tips:
  - Choose a secure location with at least one local wired Ethernet connection for the gateway to use. During setup, you will also need a second connection to the Internet for your computer.
  - Make sure that a standard electrical outlet (typically 110 VAC, 15 amps) is within reach of the gateway's power adapter.
  - Make sure the gateway is mounted in a weatherproof area, or in a weatherproof enclosure.
  - Choose a mounting position that will allow you to access the gateway's I/O ports, and allow you to inspect the gateway's power and Ethernet indicator lights for troubleshooting.
  - Physical distance from some types of devices can be an important factor. When using mesh, powerline, or low-power wireless networks, consider mounting the gateway at a physically central location, or in close proximity to as many devices as possible.
  - For best performance when using wireless networks, do not mount the gateway inside a metal enclosure. If possible, avoid putting the gateway near large metal assemblies such as computer racks and metal-screened rooms.
- A computer running a recent version of a popular web browser.
  - Supported browsers are Firefox*, Chrome*, Internet Explorer*, and Safari*. Browser versions must be current within the past 12 months.
  - Before starting the gateway installation, check the wired Ethernet connection at the gateway location for access to the Internet. Open a browser window and

verify that you can log in to your account at https://pwr.tools. If you do not have a PowerTools account, contact CANDI at https://support.pwr.tools.

- At least one properly installed and working device to test with the gateway.
  - Verify that at least one supported device (such as a sensor, switch, or meter) is installed on site within network range of the gateway, and operating according to its manufacturer's instructions. For example, verify that devices using BACnet are addressable over the BACnet network, and that devices using Ethernet are addressable over the local Ethernet network.
  - Intel and CANDI do not provide device installation support or troubleshooting. See the device's installation manual or manufacturer's website to correctly install and test devices.
  - For a list of supported devices, see www.intel.com/bmp.
- The MAC address of your gateway (printed on your gateway in XX:XX:XX:XX:XX:XX format).
- The IP (or other network) address of each of your devices (for example, light switches and thermostats).
- The location in the building of each device (floor number, room or suite number, and a short description for each). ***Important:*** You can provision as many devices as you like, but each one must already be installed in your building and functioning properly according to its manufacturer's instructions.
- The email address you will use to manage access and data from this gateway.

## 3.2 Step 2: Install Your Gateway

To install the gateway:

1. Unpack the box. You will find a gateway, antennas, and a power cord.

   This is a good time to record the gateway's MAC address and other useful information. Use your smartphone to take a picture of the bottom of the gateway, or write down the MAC address for later reference. Some gateways have more than one MAC address; be sure to record them all.
2. Mount the gateway securely at the location you have chosen.
3. Connect an Ethernet cable between the gateway and the local area network (LAN). Of the two Ethernet ports on the gateway, use the one on the right side.

4. On the gateway, install any other I/O devices, such as a radio-to-USB bridge, that you will use to connect to devices.
5. Insert the power cord in the gateway and twist the connector until it is secure. Connect the other end of the power cable to the surge protector or electrical outlet.

6. If the gateway does not power up automatically, push the power button to turn on the gateway.


7. Confirm that the power LED displays a steady green light. Allow at least 30 seconds for the gateway to go through its startup process.
8. Look again at the gateway's Ethernet port. Make sure its LEDs are lit. When the gateway is powered up, a solid light at the Ethernet port indicates an Ethernet connection, and a flickering light indicates data traffic.

Need help? Intel provides technical support for gateways through the Intel® Premier Support portal. To submit a support request using Intel Premier Support, go to https://premiersupport.intel.com.

## 3.3 Step 3: Log In to PowerTools

For security reasons, your gateway is authenticated and managed through a PowerTools account. If you do not have a PowerTools account, contact CANDI at https://support.pwr.tools.

1. Without interrupting the gateway's Ethernet connection, connect a laptop or tablet to the Internet and open a browser window to https://pwr.tools.
2. Log in to your PowerTools account. The PowerTools dashboard appears.
3. On your PowerTools dashboard, choose **Sites**. Select the site where your gateway and devices will be installed. Sites are set up through your account contact at CANDI. If you need to edit a site or access a new site, contact CANDI at https://support.pwr.tools.

## 3.4 Step 4: Set Up Your Devices

After it is powered up on a network, your gateway automatically registers online with PowerTools and connects to your site. You can now add other devices to the site. Some devices can be automatically discovered by the gateway. Others must be manually added to the site.

***Note:*** Always install and test your device according to its manufacturer's instructions before adding it through PowerTools.

### 3.4.1 Add Devices

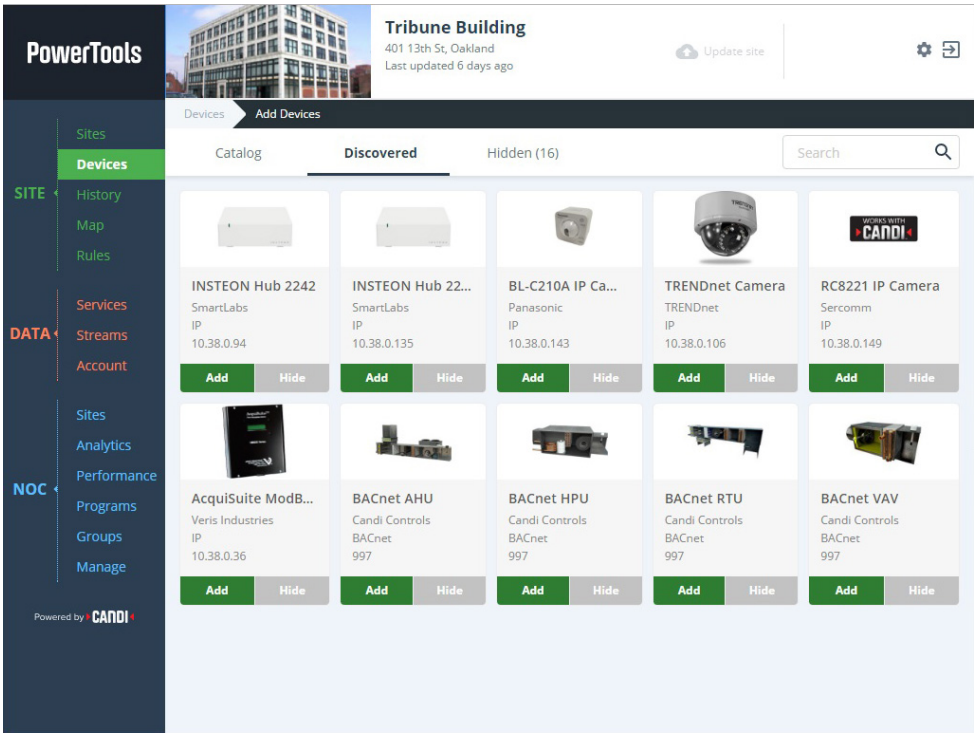
To add a device:

1. On the PowerTools dashboard, make sure that the site you are working on is selected (displayed in the top menu).
2. From the left menu, choose **SITE** > **Devices**. You will see a list of devices that have been assigned to that site.
3. Click the **Add a device** button.

The Devices page changes to show the **Catalog**, **Discovered**, and **Hidden** tabs.

### Discovered Devices

The Discovered tab shows a list of devices that your gateway has discovered on a local network. For example, some devices advertise their presence over the Ethernet network they share with the gateway, and some devices are pre-registered during the installation process via a USB radio dongle (ZigBee*, Z-Wave*) that is now plugged in to the gateway. Not all devices allow themselves to be automatically discovered, but those that do are the easiest to add, so start with this tab.

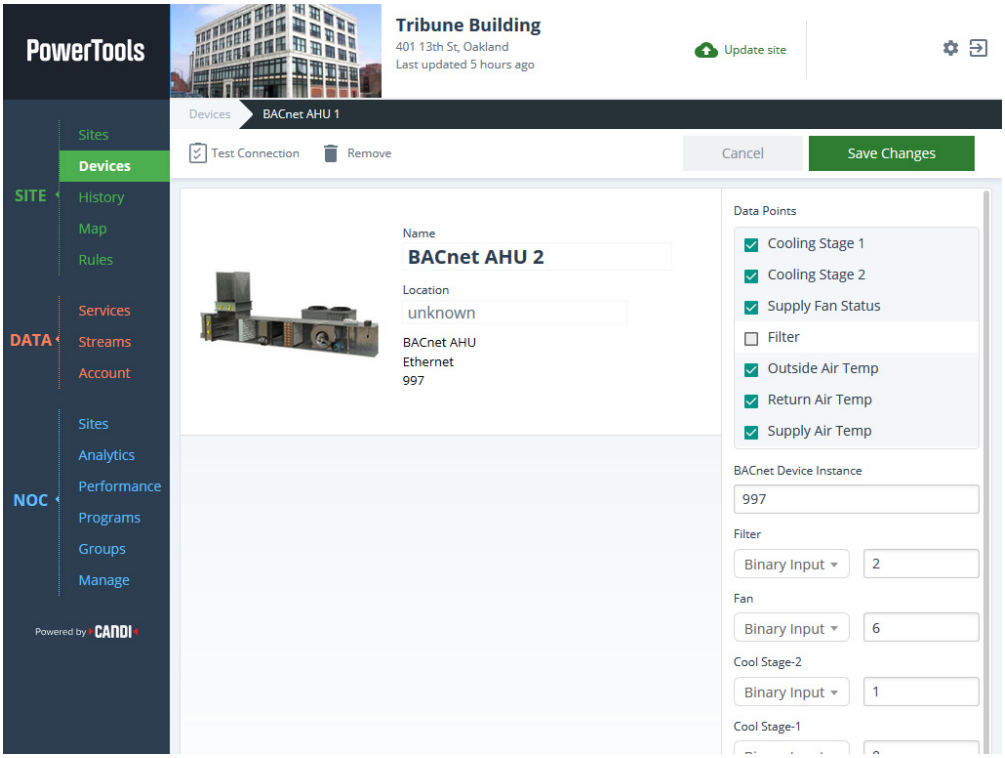



If you don't see any devices on the Discovered tab, skip to the Catalog tab instructions below.

If any devices appear on the Discovered tab:

1. Select a discovered device that you want to manage through the gateway, and click its **Add** button. A **Device Details** page appears.
2. Enter information required for the gateway to communicate with your device. You can also edit fields that help to identify the device, such as its unique name and location.

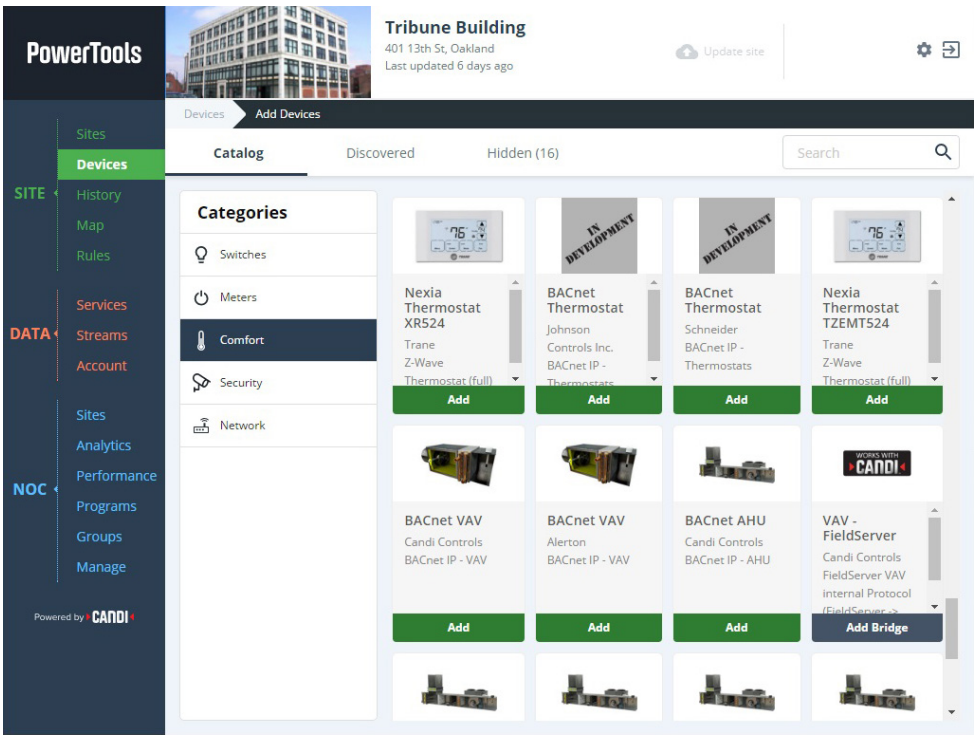
   Most Device Details pages also display a list of available Data Points that the device can provide, accompanied by checkboxes. Each Data Point is the name of a type of data available from this device that you can monitor, manage, or control. Some devices have a large number of Data Points, and you might not need data from all of them. Check the boxes next to the Data Points you want from this device.




3. After you have filled in the required fields and selected the Data Points you want data from, click **Save Changes**. You can now see the newly added device in the list of all devices on the site.
4. Repeat Steps 1 through 3 for each device on the **Discovered** tab.
5. If you see a discovered device that you do not want to manage through the gateway, click the **Hide** button. That device will be moved from the **Discovered** tab to the **Hidden** tab so that you will not have to revisit this device every time you visit the **Discovered** tab.
6. After you have finished adding your devices, click **Update site** at the top of the PowerTools screen. PowerTools connects with the gateway and downloads the needed data to allow the gateway to identify, communicate with, and gather data from your devices.

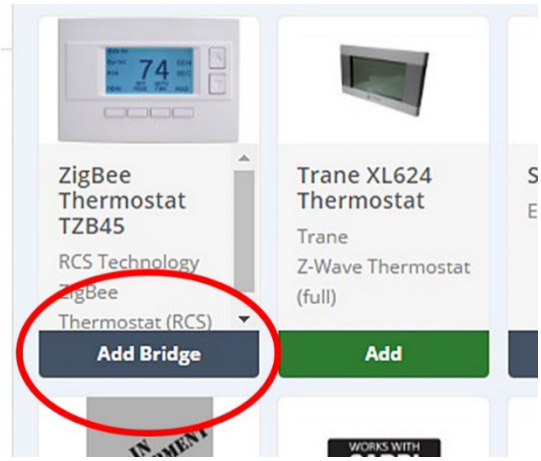
### The Catalog

For large installations, you will add many devices through the Catalog. The Catalog tab enables you to find and add supported devices by type, make, and model.




1. On the **Catalog** tab, search or browse through the catalog to find the device you want to add. To search, choose a category first, such as Switches, then type at least three letters of a search term, such as a manufacturer name, in the Search box.
2. When you find the device you want to add, click its **Add** button. A **Device Details** page appears.

***Note:*** Some devices require you to add a protocol bridge or network interface to the gateway before you add the device. For example, a USB or network ZigBee radio bridge is required before a ZigBee endpoint device can be added. In another example, a pulse counter might be required in the system before a passive pulse output device can be added. For those devices, the PowerTools Catalog presents the device with an **Add Bridge** button. Click the **Add Bridge** button to see a list of bridge products that support that device. Select and add the bridge first, then return to the Catalog and add the device. After you have added the appropriate bridge, PowerTools will recognize that the bridge exists, and you can then add as many endpoints as that bridge supports.

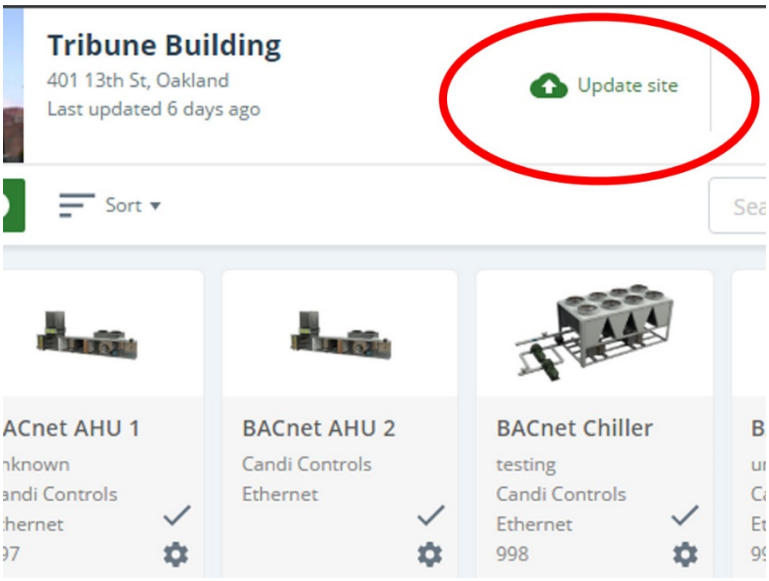



3. Enter information required for the gateway to communicate with your device. You can also edit fields that help to identify the device, such as its unique name and location.

   Most Device Details pages also display a list of available Data Points that the device can provide, accompanied by checkboxes. Each Data Point is the name of a type of data available from this device that you can monitor, manage, or control. Some devices have a large number of Data Points, and you might not need data from all of them. Check the boxes next to the Data Points you want from this device.
4. After you have filled in the required fields and selected the Data Points you want data from, click **Save Changes**. You can now see the newly added device in the list of all devices on the site.
5. Repeat Steps 1 through 4 for each device you want to add.
6. After you have finished adding your devices, click **Update site** at the top of the PowerTools screen. PowerTools connects with the gateway and downloads the needed data to allow the gateway to identify, communicate with, and gather data from your devices.

## 3.5 Finishing Your Installation

After you have finished adding your devices, or at any point that you want to make sure your changes are saved, click **Update site** at the top of the PowerTools screen. PowerTools connects with the gateway and downloads the needed data to allow the gateway to identify, communicate with, and gather data from your devices.




Congratulations! You have successfully installed the gateway and provisioned your devices.

When you are finished, log out of PowerTools by closing your browser window, or clicking the Log Out icon at the top right corner of your screen.

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