

# Building Optimization Broker Quick Start Guide

## BAS Network Connectivity

Welcome! This is your guide to getting your BAS Agent up and running.

- [Connecting Your BAS Agent](#) (see page 1)
- [Configuring the Network](#) (see page 3)
- [Cloud Communications](#) (see page 5)
- [Troubleshooting BAS Agent Cloud Connections](#) (see page 6)

## Connecting Your BAS Agent

### Network Requirements

For System Administrators setting up an Agent on their network it's important to understand that the firewall does not need to allow external devices to connect to the Agent. The firewall only needs to allow the Agent to make an outbound connection to the NEXT cloud on TCP Port 443 (and UDP Port 123 if external NTP is required)

1. Plug Agent in using the included power supply.
2. Connect Agent to your local network via CAT5, CAT5E, or CAT6 cable.

## Sign into the Building Optimization Broker

1. Navigate to [bob.key2act.io](http://bob.key2act.io)<sup>1</sup>.
2. Sign in using your previously created WennSoft account.

If you do not have a WennSoft account, sign up here: <https://bob.key2act.io/signUp>

## Create a Company

If a Company already exists, you can skip this step.

1. Select the **App Drawer** icon.
2. Select the **Admin** icon to access the Admin dashboard.
3. If no companies currently exist, the **Company** card displays "You haven't been invited to join a Company".
4. Select *Create Company*.
5. Complete the fields in the **Create Company** pane:
  - Company Name
  - Contractor Type
  - Address 1
  - Address 2
  - City
  - State
  - ZIP
6. Select *Create*.
7. The Company information displays on the card.
8. Once the new Company is created, you will be prompted to provide Billing Contact information
9. Enter the information for your Billing Contact

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<sup>1</sup> <http://bob.key2act.io/>


- Billing Contact Name
- Billing Contact Email
- Billing Contact Phone
- Address 1
- Address 2
- City
- State
- Zip

10. Select *Save*.

*New Company creation will require verification from WennSoft before your Company is enabled. You will be unable to move on to the next step until your Company is enabled. Please contact K2A Support for help: [support@wennsoft.com](mailto:support@wennsoft.com)<sup>2</sup>*

## Adding a BAS Agent to your Company




1. Select the **App Drawer** icon and then select *IoT Hub*.
2. From the IoT Hub dashboard, on the BAS Agent card, select *Manage BAS Agents* OR select the BAS Agent icon from the left navigation.
3. On the BAS Agent dashboard, select the *New Agent* button.
4. In the New Agent Configuration window, enter the **Agent Configuration Name**.
5. (Optional) Enter the **Serial Number**. The serial number is verified. If the serial number does not exist for the agent or if the serial number is already assigned to an Agent, a message displays.

 The serial number format is XXXXX-XXXXX-XXXXX-XXXXX-XXXXX. Five sets of five alphanumeric characters plus the hyphens.

6. Select *Next*.
7. Review the settings and then select *Create* to add the new BAS Agent.

## Congratulations! You have successfully added your BAS Agent.

After adding the BAS Agent, the BAS Dashboard displays the Connection Status.


Icon	Description
	Connected
	Not Connected
	No Status

<sup>2</sup> <mailto:support@wennsoft.com>

## (Optional) Connecting to On-board UI via Wi-Fi

This optional step allows you to configure static IP addresses or change local configuration settings. It may not be required for most installations.

1. View available Wi-Fi networks on your computer
2. Connect to your Agent's Wi-Fi network  
*Your Agent's Wi-Fi network is K2A-#### (the last 5 digits of your Agent's serial number)*
3. Enter the Wi-Fi password. (Please contact K2A Support for the password.)
4. Once connected to your Agent's Wi-Fi network, open a web browser, and navigate to <https://192.168.7.1:57000> to access the on-board UI
5. Enter the admin credentials. (Please contact K2A Support for the login credentials.)

 Connecting to the onboard UI will only allow HTTPS connection. If you are unable to connect, please ensure that you are connecting to <https://192.168.7.1:57000/>.

## Configuring the Network

Now that your Agent is connected, let's get it communicating with the Building Automation System!


### Configure the BAS Network

1. Select the **App Drawer** icon and then select *IoT Hub*.
2. From the IoT Hub dashboard, on the BAS Agent card, select *Manage BAS Agents* OR select the BAS Agent icon from the left navigation.
3. Select the ellipsis icon to the right of the agent name.
4. Select *Manage Agent*.
5. On the Agent Dashboard, on the action panel card, select *Configure BAS Network*.

### BACnet IP Configuration

To allow a Building Optimization Broker BAS Agent to retrieve data from the BACnet, the IP information needs to be set up. This requires the basic Scanning BAS Networks steps with the addition of finding which BACnet device is the BBMD (BACnet Broadcast Management Device).


1. In Building Optimization Broker, select the **IoT Hub** application from the app drawer.
2. Select **Manage BAS Agent** on the *BAS Agents* card.
3. From the list of BAS Agents available, select the ellipsis icon to the right of the agent from which you want to scan a BAS, and select **Manage Agent**.

 If you haven't created an agent yet, see [Adding a BAS Agent](#)<sup>34</sup>.

<sup>3</sup> <https://wennsoft.atlassian.net/wiki/spaces/BOB/pages/8301196/Adding+a+BAS+Agent>

<sup>4</sup> <https://wennsoft.atlassian.net/wiki/spaces/BOB/pages/8301196/Adding+a+BAS+Agent>


4. On the Agent Management page, under the *Agent Actions* card, select **Configure BAS Network**.
5. On the *Network Configuration* page, under the *BAS System Driver* dropdown, select **BACNet-IP**. See [BACnet-IP Configuration](#)<sup>56</sup>.
6. Under the *BAS Agent BACnet Settings*, enter the **BAS Agent BACNet Device ID** to the desired value if you wish to set up the Agent as a BACnet device, otherwise leave blank. **BAS Agent UDP Port** and **Subnet Mask** can typically be left at their default values of **47808** and **255.255.255.0**. Only change these values if your BAS configuration requires.
7. (Optional) Under the *BACnet Network BBMD Settings*, enter the **BBMD IP address** and **BBMD UDP Port** of the BACnet device that is has been assigned to be the BBMD (if applicable), otherwise, leave blank.
8. Select *Save*, if applicable.
9. Select the *BAS Agents* icon from the app tray and again select **Manage Agent** for your agent. This can also be done by selecting your agent name in the breadcrumb trail at the top of the *Network Configuration* page, select the Agent.
10. Under Agent Actions, select **View BAS Inventory**.
11. On the BAS Inventory screen, select **Refresh Inventory**.

 Refreshing inventory will perform a background scan. This scan may take a few minutes depending upon the inventory size. You can check the agent connect status to see the progress of the scan. The status displays "inventory scanning" while the scan is in progress. See [Working with BAS Inventory](#)<sup>78</sup> and [Viewing Logs](#)<sup>910</sup> for more information.

## Tridium Niagara (oBIX) Configuration

The Network information needs to be set up to allow a Building Optimization Broker BAS Agent to retrieve data from a Niagara system.

1. In Building Optimization Broker, select the **IoT Hub** application from the app drawer.
2. Select **Manage BAS Agent** on the *BAS Agents* card.
3. From the list of BAS Agents available, select the ellipsis icon to the right of the agent from which you want to scan a BAS, and select **Manage Agent**.

 If you haven't created an agent yet, see [Adding a BAS Agent](#)<sup>11</sup>.

4. On the Agent Management page, under the *Agent Actions* card, select **Configure BAS Network**.
5. On the Network Configuration page, under the *BAS System Driver* dropdown, select **Tridium Niagara (oBIX)**. See [Tridium Niagara \(oBIX\) Configuration](#)<sup>1213</sup>.
6. Under Niagara Network Settings, enter the following:
  - **Niagara Station IP Address:** Enter the Internet Protocol (IP) address or web address.
  - **Niagara HTTPS/HTTP Port:** Enter the port number.
  - **oBIX Lobby Path:** This is typically *obix*.
7. Select the **Authentication Type**.
8. Mark **This is a device I trust**. BOB will download any certificates presented by the host.

5 <https://wennsoft.atlassian.net/wiki/spaces/BOB/pages/8301214/BACnet-IP+Configuration>

6 <https://wennsoft.atlassian.net/wiki/spaces/BOB/pages/8301214/BACnet-IP+Configuration>

7 <https://wennsoft.atlassian.net/wiki/spaces/BOB/pages/8297497/Working+with+BAS+Inventory>

8 <https://wennsoft.atlassian.net/wiki/spaces/BOB/pages/8297497/Working+with+BAS+Inventory>

9 <https://wennsoft.atlassian.net/wiki/spaces/BOB/pages/8301188/Viewing+Logs>

10 <https://wennsoft.atlassian.net/wiki/spaces/BOB/pages/8301188/Viewing+Logs>


11 <https://docs.key2act.io/display/BOB/Adding+a+BAS+Agent>

12 <https://wennsoft.atlassian.net/wiki/spaces/BOB/pages/8291853/Tridium+Niagara+%28oBIX%29+Configuration>

13 <https://wennsoft.atlassian.net/wiki/spaces/BOB/pages/8291853/Tridium+Niagara+%28oBIX%29+Configuration>

 The Save button is disabled if this checkbox is not marked.

9. Under Niagara Credentials, enter the **Username** and **Password** for the Niagara connection.
10. In the Advanced Security Settings section, mark the appropriate security checkboxes. See [Tridium Niagara \(oBIX\) Configuration](#)<sup>14,15</sup> for more information.
11. Select *Save*.
12. Select the BAS Agents icon from the app tray and again select **Manage Agent** for your agent. This can also be done by selecting your agent name in the breadcrumb trail at the top of the Network Configuration page, and then select the Agent.
13. Under Agent Actions, select **View BAS Inventory**.
14. On the BAS Inventory screen, select **Refresh Inventory**.

 Refreshing inventory will perform a background scan. This scan may take a few minutes depending on the inventory size. You can check the agent connect status to see the scan's progress. The status displays "inventory scanning" while the scan is in progress. See [Working with BAS Inventory](#)<sup>16</sup> and [Viewing Logs](#)<sup>17</sup> for more information.

## Cloud Communications

Agents are designed to communicate to the BOB cloud via MQTT (Message Queuing Telemetry Transport) over TLS using ALPN (Application Layer Protocol Negotiation) and HTTPS. This means that the Agent communicates to the internet on TCP Port 443 only (unless NTP is unavailable on the local network, in which case the Agent will need to communicate on UDP Port 123).

For System Administrators setting up an Agent on their network, it is important to understand that the firewall does not need to allow external devices to connect to the Agent. The firewall only needs to allow the Agent to make an outbound connection to the BOB cloud on TCP Port 443 (and UDP Port 123 if external NTP is required).

Below are the URLs that the Agent will need to communicate with externally:

- **AWS IoT Group Management**  
[greengrass.us-east-1.amazonaws.com](https://greengrass.us-east-1.amazonaws.com)<sup>18</sup> | TCP Port 443
- **AWS IoT Device Management**  
[a2h2778cvs6c7x-ats.iot.us-east-1.amazonaws.com](https://a2h2778cvs6c7x-ats.iot.us-east-1.amazonaws.com)<sup>19</sup> | TCP Port 443  
[a2h2778cvs6c7x.iot.us-east-1.amazonaws.com](https://a2h2778cvs6c7x.iot.us-east-1.amazonaws.com)<sup>20</sup> | TCP Port 443
- **AWS IoT Device Discovery**  
[greengrass-ats.iot.us-east-1.amazonaws.com](https://greengrass-ats.iot.us-east-1.amazonaws.com)<sup>21</sup> | TCP Port 443  
[greengrass.iot.us-east-1.amazonaws.com](https://greengrass.iot.us-east-1.amazonaws.com)<sup>22</sup> | TCP Port 443
- **AWS IoT Device Data**  
\* [s3.amazonaws.com](https://s3.amazonaws.com)<sup>23</sup> | TCP Port 443

14 <https://wennsoft.atlassian.net/wiki/spaces/BOB/pages/8291853/Tridium+Niagara+%28oBIX%29+Configuration>

15 <https://wennsoft.atlassian.net/wiki/spaces/BOB/pages/8291853/Tridium+Niagara+%28oBIX%29+Configuration>

16 <https://docs.key2act.io/display/BOB/Working+with+BAS+Inventory>

17 <https://docs.key2act.io/display/BOB/Viewing+Logs>

18 <http://greengrass.us-east-1.amazonaws.com>

19 <http://a2h2778cvs6c7x-ats.iot.us-east-1.amazonaws.com>

20 <http://a2h2778cvs6c7x.iot.us-east-1.amazonaws.com>

21 <http://greengrass-ats.iot.us-east-1.amazonaws.com>

22 <http://greengrass.iot.us-east-1.amazonaws.com>

23 <http://s3.amazonaws.com>

- **AWS IoT Device Logs**  
[logs.us-east-1.amazonaws.com](http://logs.us-east-1.amazonaws.com)<sup>24</sup> | TCP Port 443
- **Mender Update Server**  
<https://hosted.mender.io> | TCP Port 443
- **Time Synchronization (Optional)**  
[pool.ntp.org](http://pool.ntp.org)<sup>25</sup> | UDP Port 123

## Troubleshooting BAS Agent Cloud Connections

The BAS Agent must connect to two destinations (AWS Internet and BAS Network) at the same time using the same network interface. A network interface is a point of interconnection between a computer and a private or public network. You may see this referred to as the NIC, Network Adapter, or Ethernet port. After completing the steps below and you are unable to connect, contact your Project Manager, [support@wennsoft.com](mailto:support@wennsoft.com)<sup>26</sup>, or call 262.317.3800.

### Determine if there is a Connection to a Network

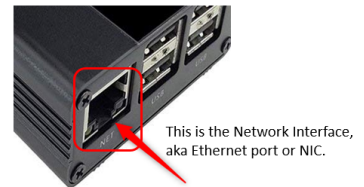
There must be a link to a network device, usually a switch. The connection is visible by the presence of a link light.

The link light is the **Green LED** on the Ethernet port.

- **Solid Illuminated:** Established a link.
- **Blinking:** Communication is occurring.

The **Yellow LED** indicates a 100 Mb network speed established. Older networks that provide 100 Mb speed also work.

**⚠** First, test the Agent on a functioning network to rule out an Agent concern.



### Green and Yellow LEDs on the Ethernet port do not illuminate

The BAS Agent may not have power connected.

Look for the **Red Power LED** on the other side of the BAS Agent.

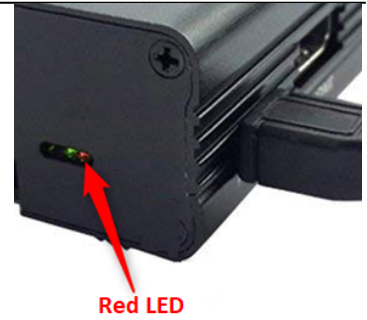
<sup>24</sup> <http://logs.us-east-1.amazonaws.com>

<sup>25</sup> <http://pool.ntp.org>

<sup>26</sup> <mailto:support@wennsoft.com>

**Red Power LED *is not* illuminated**

Check the power supply and replace if needed; the BAS Agent does not have power.

**Red Power LED *is* illuminated BUT the Green LED on the Ethernet port is not**

Try replacing the cable; the network cable may be defective.

**Green and Red Power LED are illuminated but still no connection**

Look for a Green LED next to the RED Power LED.


The Green LED blinks when the SD card is accessed. Blinking occurs every 3-4 seconds during ordinary operation (much faster during boot or logging).

**Green LED is not blinking**

Cycle power.

**Green LED is not blinking BUT the Red LED is lit**

SD Card is not able to be read accurately.

 DO NOT REMOVE THE SD Card before speaking with K2A and powering down the Agent.

## Troubleshooting via Wi-Fi

Connect to the BAS Agent's Wi-Fi network to investigate why Agent will not connect to AWS.

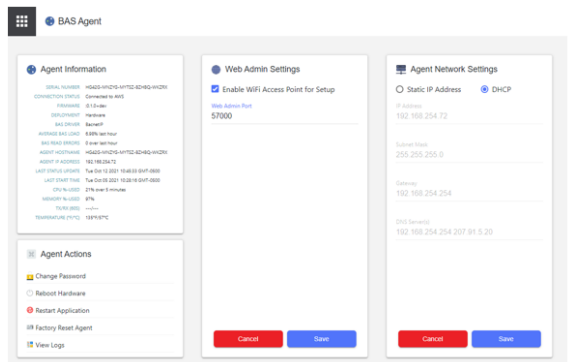
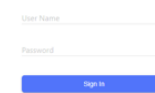
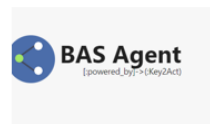
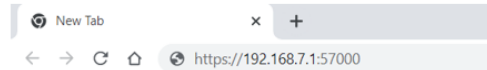
1. Startup your PC's Wi-Fi networks and search/connects to the network name:
  - **K2A Wi-Fi SSID** (Server Set Identifier aka Network Name)

**⚠** SSID will include the last 5 digits of the serial number.

- **Network Security Key:** !1n51t3!
2. Once connected, open a browser and enter the address:  
**https://192.168.7.1:57000**
  3. Enter the Admin credentials:
    - **User Name** : admin
    - **Password:** !1n51t3! **DO NOT CHANGE**
  4. Confirm the Agent Setup. Once the computer is connected, a Status window opens. Confirm the following:
    - **Serial Number:** is the same as the Agent's sticker.
    - **Static IP Address:** If required, the site IT administrator must provide the IP, Subnet, Gateway, and DNS address settings.
    - **Connection Status:** 'Connected to AWS'
    - **DHCP:** When DHCP is not selected, then Static IP is required.
  5. Once confirmed, contact your Project Manager, [support@wennsoft.com](mailto:support@wennsoft.com),<sup>27</sup> or call 262.317.3800.

### **⚠ DO NOT**

- Change Password
- Select Factory Reset Agent
- Deselect the Enable Wi-Fi Access Point for Setup checkbox



<sup>27</sup> <mailto:support@wennsoft.com>