Intelligent Gateway Installation Manual
Contents

About This Guide ........................................................................................................................................... 3
  Industry Canada Statement ......................................................................................................................... 3
  Organization .................................................................................................................................................. 3
  Document Conventions ............................................................................................................................... 3
  Warnings and Precautions .......................................................................................................................... 4
Introduction .................................................................................................................................................... 5
Hardware Detail ............................................................................................................................................. 6
Getting Started ............................................................................................................................................. 7
  Kit Components .......................................................................................................................................... 7
  Tools and Materials .................................................................................................................................... 9
Installation and Configuration ........................................................................................................................ 10
  Network Considerations ............................................................................................................................. 10
    Pre-Installation Decisions ....................................................................................................................... 11
Gateway Configuration .................................................................................................................................... 11
  Data Port Setup Tab .................................................................................................................................... 12
    Configuration Port Setup Tab .................................................................................................................. 14
    Device Manager Tab ................................................................................................................................. 14
    Password Tab ........................................................................................................................................... 15
    System Tab ............................................................................................................................................... 15
    Firmware Update ..................................................................................................................................... 16
Gateway Installation ...................................................................................................................................... 17
Gateway Mounting Shelf ............................................................................................................................... 18
  Zip-tie Mount ............................................................................................................................................ 20
  3M Command Strip ..................................................................................................................................... 21
  Final Installation Activities ....................................................................................................................... 22
Installation Inspection ................................................................................................................................... 23
  Inspect Operations and Appearance .......................................................................................................... 23
Inspect Software Communication ................................................................. 23
Troubleshooting ........................................................................................................... 25
Gateway Testing .................................................................................................................. 25
  LED behavior for Gateway Status ................................................................. 25
  LED Behavior for Radio Activity ............................................................... 25
Issues and Solutions ......................................................................................................... 26
About This Guide

This document provides guidelines and instructions for installing and configuring the SynapSense Intelligent Gateway device. The intended audience for this document consists of customers or partners of SynapSense Corporation or a SynapSense installer (or installation team). Customers, partners, or installers should receive training from SynapSense prior to installing the hardware detailed in this document.

Industry Canada Statement

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Organization

Although we prefer the entire document to be read in order of presentation, we realize that readers may jump to a particular section. The table below describes the chapters and summarizes their content.

<table>
<thead>
<tr>
<th>Table 1 – Chapter Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter</td>
</tr>
<tr>
<td>Introduction</td>
</tr>
<tr>
<td>Installation &amp; Configuration</td>
</tr>
<tr>
<td>Installation Inspection</td>
</tr>
<tr>
<td>Troubleshooting</td>
</tr>
</tbody>
</table>

Document Conventions

The table below defines the style conventions used throughout this document.
Table 2 – Installation Guide Style Conventions

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bold and Blue</strong></td>
<td>This style is used for anything a user types, clicks, presses, or taps. The style also highlights SynapSense products. For example, Click <strong>OK</strong>.</td>
</tr>
<tr>
<td><strong>NOTE:</strong></td>
<td>Exceptions to the rule and other important information will be set off with this note style.</td>
</tr>
<tr>
<td>![icon]</td>
<td>This triangular red exclamation mark icon denotes a <strong>WARNING</strong>.</td>
</tr>
<tr>
<td>![icon]</td>
<td>This triangular yellow electrical icon denotes a <strong>SAFETY WARNING</strong> of a physical or electrical nature.</td>
</tr>
</tbody>
</table>

**Warnings and Precautions**

The following warnings and precautions pertain to SynapSense Intelligent Gateway installations.

**Failure to adhere to warnings and precautions could result in physical injury or damage to equipment, which may void the warranty.**

- Installation of this equipment must be in accordance with local and national electrical codes.
- Data centers may pose a risk of hearing loss. Use appropriate ear protection prior to entry into high-noise areas.
- When performing subfloor work in a data center, be careful not to stress, crush, pull, or disconnect wiring and hoses running underneath electrical and data cables, leak detectors, etc. (including fire alarm/suppression systems).
- Subfloor work poses significant trip/fall hazards and eye hazards from airflow-borne debris. Eye protection must be worn at all times when removing or replacing floor tiles and when working in or around areas with removed tiles.
- Do not touch any electrical or computer/server equipment in the data center without approval from data center operators (including loose cables, pushcarts, and terminals).
- Ensure use of the 5VDC power supply shipped with the product.
Introduction

The SynapSense Intelligent Gateway™ is an Ethernet to wireless network bridge designed to collect data from any of the SynapSense wireless sensors or to meter hardware and send the data to a remote server. It is also designed to operate in standalone mode for some time if the Ethernet connection is lost.

The SynapSense Intelligent Gateway operates in a more centralized mode compared to previous generations of SynapSense Gateways, so it has a relatively high power CPU for its core, capable of running WSN Plug-in and Device Manager.

These installation instructions cover the physical hardware installation and configuration of the Gateway device. See the MapSense User Guide for information about adding the Gateway into a project for export to Web Console.
Hardware Detail

The Gateway is 5.5in x 5.25in x 1.63in. The Gateway can be used in a variety of mounting locations and orientations such as on the tops of racks, on wall mounts, or zip-tied to other structures.

The Unit Status LED shining solid blue or solid green means the unit is functioning normally. See Troubleshooting for the table of LED settings and error conditions.
Getting Started

Before entering the facility to install and configure the Gateway devices, ensure the completion of the following preparatory steps.

1. Review all warnings and precautions.
2. Unpack Gateway kit(s) from boxes. Count and verify quantities. At least two Gateways are required for redundancy. Ensure that each Gateway has the approved 5VDC power supply.
3. Verify that one 110VAC to 220VAC NEMA5 or C14 power outlet is available within a few feet of the intended Gateway installation location.
4. Verify that the data center operator has provided for network connectivity by either:
   a) One static IP address and two open ports for each Gateway to be installed (configuration uses port 80, data uses port 10001), or
   b) Active DHCP Host name and Domain name and two open ports for each Gateway.

   **Installation and testing cannot begin without these address and port assignments.**

   ![]
   Two ports per Gateway IP address must be open:
   - Port 80 = Configuration via the Gateway’s web page.
   - Port 10001 = Data received from SynapSense wireless sensors.

5. When adding a gateway to an existing wireless network, verify that your nodes have SynapSense firmware version 29.4 or higher, software version 6.7 or higher, and applicable documentation.
6. Verify there is only ONE Device Manager per installation. This can be:
   a) Device Manager running on one Gateway but not on any other Gateway or the server, or
   b) Device Manager running only on the Environment Server machine but not on any of the Gateways.
7. Verify that the install team has all of the required tools and materials.

**Kit Components**
The SynapSense Intelligent Gateway kit includes:

- One (1) Gateway module with jacks for Ethernet and external power
• One (1) DC Power Adapter (to convert 90-264 VAC wall power to +5VDC)
• Two (2) power cables (one C13 to NEMA 5, and one C13 to C14).

Be sure to use the correct power supply for this unit.

• One (1) Gateway Mounting Shelf (optional)
Tools and Materials

The table below lists the minimum tools and additional material requirements that SynapSense Field Engineers and contracted electricians must bring to the job site.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attire</td>
<td>Proper dress and shoes for performing work in a data center (including areas inside the sub-floor and above ceiling tiles)</td>
</tr>
<tr>
<td>Ladder or step stool</td>
<td>Ladder or step stool of sufficient height to reach all Gateway installation locations (typically placed well above the height of all server cabinets in their service radius)</td>
</tr>
<tr>
<td>Laptop</td>
<td>Laptop computer with supported browser installed (Internet Explorer, Firefox, or Chrome)</td>
</tr>
<tr>
<td>Spares</td>
<td>Spare Gateway modules</td>
</tr>
</tbody>
</table>
| Materials       | Plenum-rated Zip-ties  
|                 | Adhesive Sensor Clips  
|                 | Cable Clips  
|                 | 3M Command Strips  
|                 | Alcohol Wipes                                                               |
| Tools           | Multi-Meter  
|                 | Flashlight  
|                 | Diagonal cutters  
|                 | Utility knife  
|                 | Scissors  
|                 | Screwdrivers  
|                 | Torque wrench  
|                 | Pliers  
|                 | Wire strippers                                                                |
| Drill/bits      | Drill pilot holes for enclosure mounting                                            |
| Label maker     | Create identification labels for wires                                              |
| Documentation   | This installation document  
|                 | Printed MapSense layout of the data center (shows where Gateways will be located in the data center) |
| Identification  | Photo ID to present to data center security personnel                                |
Installation and Configuration

The following sections provide general information and specific installation instructions for installing the SynapSense Intelligent Gateway devices. The diagram below shows the process flow for a typical installation.

General Installation Guidelines

**Be consistent.** All installations should match in appearance where possible (including centering, location, method for securing extra wire, etc.).

**Be neat.** Ensure installation is straight and vertical or horizontal as much as possible.

- Install Gateways on flat, smooth surfaces such as the tops of server cabinets. Do not install Gateways in hot aisles or in any location that violates environmental specifications for the device.
- Use adhesive cable clips to keep cable and AC Power Adapter wires neat and contained.
- Each Gateway installation location should have a 110/220VAC outlet and an Ethernet port within a few feet.
- Ensure Gateway installations are not in areas where concrete walls, support pillars, large cable bundles, air ducting, or other metal enclosures can block the signals at close range.

**Keep installation area clean.**

**NOTE:** To save time, it is best to configure all Gateway devices first, then mount them in the designated locations in the data center.

**NOTE:** The Gateway device should be installed at least 15 ft. away from the Wi-Fi access point.

**Network Considerations**

The SynapSense Intelligent Gateway connects to your network using the Data port. The gateway supports IPv4 Dynamic/Static IP addresses or IPv6 Static IP addresses.

When using dynamic addressing, the gateway relies on an external DHCP server for IP
address assignments and a DNS server for the gateway’s hostname resolution. Consult with your network administrator to understand your network’s DHCP/DNS configuration before installing the SynapSense Intelligent Gateway on your network.

When using IPv6 static addresses, we recommended using IPv6 ULA (Unique Local Address) schemes and DHCP/DNS servers configured to support IPv6. Some network switches will forward, but not route, IPv6 packets. Please consult with your network administrator to understand your network’s capabilities before configuring the SynapSense Intelligent Gateway with an IPv6 static address.

**Pre-Installation Decisions**

Decisions about the following options should be made well in advance of your arrival at the customer site.

- **Location for Device Manager** – Before installation, a decision must be made about where to run Device Manager. The Device Manager can run on either ONE SynapSense Intelligent Gateway or on the SynapSense Environment Server. The Device Manager cannot be running in both locations or on more than one gateway. Only one Device Manager can be running on the network at a time.

- **DHCP or Static IP** – The SynapSense Intelligent Gateway supports the use of DHCP or Static IP. If using Static IP, the customer must provide a static IP address for each Gateway. If using DHCP, the customer must provide the network configured and resolveable hostname and a fully qualified domain name.

**Gateway Configuration**

Prior to mounting each Gateway module in its assigned position in the data center, take a laptop, Ethernet cable and all the Gateways to a comfortable location near a power outlet (e.g. break room or data center IT office) and configure the Gateway IP addresses and subnet masks.

*Note:* SynapSense may have performed the Gateway configuration prior to shipment. If configuration is complete, proceed to Installing the Gateway. If configuration is not complete, or to change an IP address/hostname, perform all installation activities.

- **Static IP addresses or hostnames** and open ports for each Gateway should be provided by the data center’s IT department and ready for use.
To connect the gateway to the laptop

1. Connect the correct power cable to the gateway’s power adapter.
2. Plug the 5VDC cord into the Gateway power port marked 5VDC, then plug it into a power outlet.
3. Confirm that your computer’s network interface is enabled and configured for DHCP. Unless configured otherwise, the gateway will dynamically assign an IP address (IPv4, 192.168.1.100) to the computer connected to the Gateway Configuration Port.
4. With an Ethernet cable, connect the Gateway Configuration Port to a laptop that is loaded with an Internet browser.
5. The Radio Activity LED should be OFF and the Unit Status LED will blink RED continuously to indicate the unit is ON.

**Data Port Setup Tab**

After connecting the Gateway to the laptop, use the following procedure to configure the data port.

To change the Gateway IP address and subnet mask

1. With an Ethernet cable, connect the laptop to the “Config” port on the Gateway. The Gateway will assign an IP address to the laptop/computer. Confirm the laptop network interface is configured for DHCP, and not already assigned a static IP address.
2. Open a browser window and type http://synapconfig.localnet into the URL field.
3. Log in as admin with the password admin.
4. On the Data Port Setup tab, select the type of IP address assignment: DHCP or Static.
5. For DHCP, do the following:
   a. Select the DHCP radio button.
   b. Enter the Host name and Domain name (optional). Remember to make a note of the Gateway Hostname or static IP address. This information must be entered in the Gateway Address properties field for the Gateway in MapSense.
   c. Click Apply.
6. For Static IPv4, do the following:
   a. Select the Static radio button.
   b. Enter the IP address and Subnet mask. Other fields are optional. Ensure the static addresses on the configuration port and the data port are on different subnets.
   c. Click Apply.

7. For Static IPv6, do the following:
   a. Complete Step 6 to configure the IPv4 section.
   b. Then, select the IP version 6 checkbox to display additional fields.
   c. Enter IPv6 address and Subnet prefix length. Other fields are optional.
   d. Click Apply.
Configuration Port Setup Tab
The Configuration Port Setup tab, displays information automatically. No action is required.

Device Manager Tab
The SynapSense Intelligent Gateway can run the SynapSoft Device Manager. Use the following process only if you plan to run the Device Manager on the Gateway and not on the Environment Server.

If you are running the Device Manager on the Environment Server, do not complete the information on the Device Manager tab.

**NOTE:** There can only be ONE Device Manager per installation. This can be either:

a) Device Manager running on one Gateway but not on another Gateway or the server, or
b) Device Manager running only on the Environment Server machine but not on any of the Gateways.

To run Device Manager on the Gateway

1. On the Device Manager tab, verify the information in the Environment Server address and NTP (Network Time Protocol) Server fields. If an NTP server is not available due to the SynapSense hardware existing in a private network, please follow the instructions given in the Issues and Solutions section of this document.

**NOTE:** After setting the NTP server for the first time, once you click Apply on the Device Manager tab, the system will log the user out if the NTP server is available and the Gateway was able to connect to it. This is normal. The date/time displayed for the Gateway will jump from 1970 (the default) to the current date/time. This jump in time, in effect, makes the user session expire so the user will need to log in again.
2. Click the checkbox for Enable Device Manager. Click **Apply** to start Device Manager on the Gateway. If Device Manager starts properly but does not yet have connectivity to the SynapSense Environment Server, the Status LED on the Gateway will blink Red and Blue.

The light can blink RED up to 30 seconds after start. If the light continues to blink RED, check the log then refer to the **Troubleshooting** section of this guide.

**Password Tab**

Use the Password tab to change the user password. The User Name is predefined as “admin”. The default password is “admin” and can be changed by the customer.

Should you forget the password, the remedy is to reset the device. See **Troubleshooting**.

**System Tab**

The information in the upper portion of the System tab auto-populates. In the lower portion, the operating system log displays as well as buttons for updating the firmware, disconnecting Device Manager communication to the gateway, and rebooting the gateway.

**OS Log** – Displays the system log for the device. Select the **Auto refresh** checkbox to enable automatic updates to display in the text area.
Browse – When instructed to do so by SynapSense Customer Support, the Browse button enables the user to navigate to the location of a firmware upgrade file and run the upgrade script. See Firmware Update instructions.

Disconnect DM – Closes communication between the gateway and the Device Manager process. This may be performed at the request of SynapSense Customer Support, when the existing connection is hung or not working appropriately.

System Reboot – Reboots the Gateway.

Firmware Update
When the Gateway needs a firmware update, the SynapSense Customer Support team will notify you. After you receive the upgrade file, follow the steps below to complete the update.

**NOTE:** Do not disconnect the power to the Gateway at any time during this update process.

To update SynapSense Intelligent Gateway firmware

1. Open the Configuration dialog and select the System tab. See To connect the gateway to the laptop for help completing this step.
2. Click the Browse button located in the lower left of the System tab.
3. Navigate to the location where you saved the firmware update file. Click to select the file, then click **OK** to close the dialog and start the upload process.

   A progress bar displays during the upload.

4. Once the file upload is complete, two new buttons display: Upgrade and Purge. Select **Upgrade** to proceed with the update, then click **OK** to close the verification message.

   **NOTE:** This part of the process can take several minutes. You will know the update is complete when the Gateway reboots and the login screen displays.

5. Once the update process is complete, the login screen displays. Sign in and open the System tab.

6. To verify the update, check that the new firmware version number is shown in the System File Version field.

**Gateway Installation**

Assess the installation location and determine which type of mounting is best.

- If the location requires a mounting shelf, proceed to Gateway Mounting Shelf instructions.
- If the location is a perforated surface, like a rack top, proceed to Zip-tie Mount.
- If the location is a solid surface that requires an adhesive mount, proceed to 3M Command Strip instructions.
Gateway Mounting Shelf

The Gateway Mounting Shelf is designed for use with both the SynapSense Intelligent Gateway and the smaller SynapSense Remote Gateway 2.

*NOTE:* Screws and other associated hardware for mounting the Gateway Mounting Shelf are not included in the SynapSense Gateway kits and must be supplied by the customer.

To mount a gateway shelf

1. Using the holes on the mounting shelf as a template, position the shelf in the desired location (i.e., wall or pillar), and mark the holes to be drilled with a pencil.

2. Using a drill and the appropriate drill bit, drill the four mounting holes marked on the installation surface.

3. Install appropriate-sized screws in the drilled mounting holes. Do not tighten screws completely. Leave the screws protruding slightly from the wall.
4. Align the screws with the holes in the Gateway Mounting Shelf and slide the screws into the slots, thereby hanging the shelf on the wall. Insert a screwdriver through the front mounting holes and tighten the screws to the secure shelf to the wall.

5. Connect the Power Adapter to the Gateway and to the designated power outlet.

6. Connect the designated Ethernet Cable (originating from a server port assigned by the data center’s IT department) to the Gateway.

   The Radio Activity LED will remain OFF.

   The Unit Status LED will blink RED continuously when the unit is ON.

7. Insert the Gateway mounting spacers into the front mounting holes for the larger SynapSense Intelligent Gateway and slide the Gateway downward to bottom of mounting hole slots.
8. Use the shelf enclosure to stow excess cord into a neat bundle. Secure and route Power Adapter wire and Ethernet Cable using adhesive Cable Clips.

Repeat the previous steps to install additional Gateways.

When all Gateways are installed, proceed to the Final Installation Activities section.

**Zip-tie Mount**

Zip-ties are the most common type of mount in SynapSense installations due to the fact that most racks have perforated tops to allow heat to escape.

To mount a gateway with Zip-ties

1. Thread the Zip-tie through the four zip-tie hold downs that are part of the Gateway case then through the holes of the mesh top of the rack.

2. Fasten securely and trim the excess so the mounting looks neat.

3. Connect the Power Adapter to the Gateway and the designated power outlet.
4. Connect the designated Ethernet Cable (originating from a server port assigned by the data center’s IT department) to the Gateway.

5. The Radio Activity LED will remain ON to indicate on-going radio communication activity.

6. The Unit Status LED will remain OFF unless there is a problem. See Troubleshooting for a table of status colors. Secure and route Power Adapter wire and Ethernet Cable using adhesive Cable Clips.

7. Repeat previous steps for remaining Gateways to be installed.

When all Gateways are installed, proceed to the Final Installation Activities section.

3M Command Strip
Adhesive mounting is used for solid surfaces where a mounting shelf cannot be used.

To mount a gateway with command strips

1. Clean installation surface with alcohol wipes. Allow area to dry thoroughly.

2. Attach Command Strips (double-sided adhesive strips) to the back of the Gateway to anchor it to the rack.

3. Connect the Power Adapter to the Gateway and the designated power outlet.

4. Connect the designated Ethernet Cable (originating from a server port assigned by the data center’s IT department) to the Gateway.

5. The Radio Activity LED will remain ON to indicate on-going radio communication activity.

6. The Unit Status LED will remain OFF unless there is a problem. See Troubleshooting for a table of status colors.

7. Remove adhesive covers from the Command Strips on the back of the Gateway.

8. Mount the Gateway onto cleaned surface (i.e., top of server cabinet). Press firmly for 30 seconds.

9. Secure and route Power Adapter wire and Ethernet Cable using adhesive Cable Clips.

10. Repeat previous steps for remaining Gateways to be installed.
When all Gateways are installed, proceed to the Final Installation Activities section.

**Final Installation Activities**
Perform the following activities to complete the Gateway installation.

1. Clean installation area of debris (packaging etc.).
2. Dispose of trash appropriately.
3. Proceed to Chapter 4, Installation Inspection.
Installation Inspection

Inspections ensure installations are correct and Gateway devices communicate with SynapSense Web Console™.

Inspect Operations and Appearance
1. Verify all installed Gateway devices are connected properly (Power Adapter, Ethernet Cable, etc.) and receiving power.
2. Verify Gateway devices are installed in areas in which there is a clear line of sight for wireless sensors radio transmissions.
3. Verify Ethernet cables and Power Adapter wires are secured where needed.

Inspect Software Communication
Perform the following steps to confirm Gateway operations and communications (Figure 1 corresponds with steps 1 through 4). Refer to the Web Console User Guide for detailed information.

1. Access the SynapSoft Web Console software and select the appropriate data center from the Sites list.
2. Click the Floor plan tab in the Data Center section.
3. Open the slide-out menu to the right of the screen then select Wireless Sensor Network.
4. Select the network where the gateway was installed (Network: and Hop Level: dropdown lists, and associated checkboxes).
Figure 1 – Accessing Web Console Data Center Floor plan

The screen refreshes and displays the wireless sensor network (including Gateways) for the data center.

Place your cursor over a Gateway device on the display. The name and status of the device displays next to the Gateway graphic representation (see Figure 2).

Figure 2 – Web Console: Gateway Master and Slave Syncs

**NOTE:** In a data center with multiple Gateway devices, one Gateway device is designated the “master”, and the remaining Gateway devices are designated as “slaves”.

If the rollover display states “Master, sync” or “Slave, sync”, the Gateway is communicating with the software.

If the rollover display states “Master, not sync” or “Slave, not sync”, the Gateway is not communicating with the software. Refer to [Troubleshooting](#) for tips on resolving connectivity and communication issues.

**NOTE:** This process can take up to 30 minutes to synchronize with the Web Console display.

When issues are resolved, perform the previous steps in this procedure to confirm the Gateways are communicating properly.
Troubleshooting

Gateway Testing

Verify that the Gateway is reporting data properly in the SynapSoft Web Console. To do this, open the Web Console, go to the Wireless Sensor Network view and check the following:

- Gateway icon should be green (operating normally).
- Gateway icon’s rollover tool tip should display “Master, sync” or “Slave, sync”. If the tool tip indicates “Master, not sync” or “Slave, not sync” then the Gateway is not properly communicating with the software.

LED behavior for Gateway Status

<table>
<thead>
<tr>
<th>Color</th>
<th>Duty Cycle and Period</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Solid</td>
<td>During power-on and boot process the light shows solid red for the first 30 seconds. If light remains on continuously, contact SynapSense Customer Support.</td>
</tr>
<tr>
<td>Red</td>
<td>Blinking</td>
<td>Power cycle the Gateway. <strong>NOTE:</strong> Once power is off, wait 30 seconds before turning power back on. The status LED may continue blinking after starting Device Manager if the specified NTP server is not available or if the Device Manager failed to start. Refer to the log on the Device Manager tab for information about the cause and call SynapSense Customer Support.</td>
</tr>
<tr>
<td>Red/Blue</td>
<td>Blinking</td>
<td>Attempting to communicate with Environment Server. If blinking continues indefinitely, this indicates a possible configuration issue between gateway and Environment Server.</td>
</tr>
<tr>
<td>Yellow</td>
<td>Solid</td>
<td>Device Manager running locally, but unable to connect to the Environment Server. The data is being buffered locally.</td>
</tr>
<tr>
<td>Green</td>
<td>Solid</td>
<td>Running normally in standard gateway mode. No Device Manager process running.</td>
</tr>
<tr>
<td>Blue</td>
<td>Solid</td>
<td>Running normally in standard gateway mode with Device Manager running on the Gateway. Communications established and working properly with server.</td>
</tr>
</tbody>
</table>

LED Behavior for Radio Activity

<table>
<thead>
<tr>
<th>Color</th>
<th>Duty Cycle and Period</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td>SOLID</td>
<td>Critical Error</td>
</tr>
<tr>
<td>GREEN / YELLOW</td>
<td>Toggle</td>
<td>Noise scan</td>
</tr>
<tr>
<td>GREEN</td>
<td>Blink</td>
<td>Time not synchronized in App mode</td>
</tr>
<tr>
<td>GREEN</td>
<td>SOLID</td>
<td>Time synchronized in App mode</td>
</tr>
</tbody>
</table>
**NOTE:** In a high-noise environment, the LED toggles between red and blue for 5 seconds after 12 noise scan toggles, and then proceeds to the next color. This behavior indicates that the device is running in very noisy environment and may perform unreliably. When this behavior is observed, the installer should consider moving the device to a different location.

### Issues and Solutions

The following issues have occurred during testing and may occur in the field. If what you encounter is not in the list below, contact SynapSense Customer Support.

**Issue:** I am able to login to the SynapSense Intelligent Gateway, but the user interface looks garbled, broken, or is unresponsive.

**Solution:** This can happen when javascript modules are not executed properly. Ensure that your browser allows javascript to run and log into the device again.

**Issue:** I can’t remember the password.

**Solution:** On the Ethernet port side of the Gateway, there is a pinhole Reset button. Use a straightened paper clip or a piece of wire to press and hold down the button for 10 seconds. This action resets the entire device to default settings. Default ID and Password are **admin** and **admin**.

**Issue:** The Gateway needs a firmware update.

**Solution:** Open the Configuration dialog and select the System tab. At the lower left of this tab, click the **Browse** button, then navigate to the location of the firmware update file. Once uploaded, select the **Upgrade** button displayed next to the uploaded file. See **Firmware Update** for complete instructions.

**Issue:** The SynapSense Intelligent Gateway does not power on.

**Solution:** Confirm the 5VDC power adapter has a working AC voltage source and the 5VDC adapter plug is properly connected to the gateway.

<table>
<thead>
<tr>
<th>LED Color</th>
<th>Indicator</th>
<th>Mode Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN / CYAN</td>
<td>Cyan blink</td>
<td>Received WSN traffic in App mode</td>
</tr>
<tr>
<td>BLUE</td>
<td>Blink</td>
<td>Time not synchronized in SMOTA mode</td>
</tr>
<tr>
<td>BLUE / SOLID</td>
<td>Blue Blink</td>
<td>Time synchronized in SMOTA mode</td>
</tr>
<tr>
<td>BLUE / CYAN</td>
<td>Cyan blink</td>
<td>Received WSN traffic in SMOTA mode</td>
</tr>
<tr>
<td>MAGENTA</td>
<td>SOLID</td>
<td>Diagnostic mode</td>
</tr>
<tr>
<td>none</td>
<td></td>
<td>Not running</td>
</tr>
</tbody>
</table>
Issue: I’m unable to access the gateway’s web interface (http://synapconfig.localnet or http://192.168.1.1) from my computer while connected to the Config port.

Solution 1: Make sure the computer and gateway are powered on.

Solution 2: Check the network cable connection between the computer and the gateway. Confirm the computer is plugged into the Config Port. A green LED on the gateway’s network jack should illuminate with a valid connection to the computer.

Solution 3: Confirm your computer’s network interface is enabled and configured for DHCP. Unless configured otherwise, the gateway will dynamically assign an IP address (IPv4, 192.168.1.100) to the computer connected to the Config port.

Solution 4: Reset the gateway from the front panel access hole. The user, password and IP settings will be reset to defaults.

User name = admin

Password = admin

Gateway IP address: 192.168.1.1 (Config port)

NOTE: Once the gateway is properly configured, connected, and assigned an IP address on the Data port, the gateway’s web interface can be accessed via the Data port interface/network.

Issue: How do I determine the IP address of the SynapSense Intelligent Gateway connected to my network via the Data Port?

Solution: We recommend the gateway be connected to a network that provides DHCP/DNS registration and hostname resolution. By default, the gateway provides a unique gateway hostname, but the hostname can also be user specified. The “Gateway Address” in MapSense will accept a hostname or IP address in IPv4 or IPv6 format. The network should automatically resolve the gateway’s hostname to the assigned IP address.

From a computer on the same network as the gateway’s Data port connection, type the following from the command line:

ping (gateway hostname)

The ping command above should resolve and display the IP address of the gateway on your network.

Issue: Why can’t I resolve the SynapSense Intelligent Gateway’s assigned hostname using an assigned IP address I can ping?

Solution: Confirm DNS settings and functionality on your network. In most cases, your network’s DNS server should automatically register and resolve the hostname of the gateway when pinged. If you are unable to resolve DNS functionality, an entry can be added to the “hosts” file on the computer as the SynapSense Environment Server.
**NOTE:** If your gateway is using an IP address assigned by DHCP, the IP address could change at some point, making this assignment invalid.

1. Open this file in a text editor application:
   c:\Windows\System32\drivers\etc\hosts
2. Enter the gateway’s assigned IP address and assigned hostname exactly as they appear in the gateway configuration.
   For example:
   172.30.200.146    SynapSenseGW02
3. Save the “hosts” file.

**Issue:** Why are nodes not joining the WSN network and reporting to the SynapSense Web Console?

**Solution 1:** Confirm the SynapSense software installation has completed, installing all desired software components. See Control Panel > Programs and Features > SynapSoft

**Solution 2:** Confirm the SynapSense Intelligent Gateway(s) are powered on, properly configured and connected to the appropriate network via the Data port. Ability to ping the gateway at its assigned IP address and hostname is a quick way to test if the gateway is configured properly and ready to service the WSN network.

**Solution 3:** Confirm Environment Server is running and your floorplan/DL file has been successfully exported from MapSense.

**Solution 4:** Confirm Device Manager is running alongside Environment Server or on the SynapSense Intelligent Gateway.

**Solution 5:** Confirm all WSN nodes are switched on and blinking red upon initial power on. If they are not blinking, please check the batteries to ensure they are fresh.

**Issue:** The customer wants to run the Device Manager service on the Gateway but they do not have an available NTP (Network Time Protocol) server.

**Solution 1:** Use the following procedure to setup a standalone NTP service.

To install a standalone NTP server for the SynapSense Intelligent Gateway.

1. Run the ntp-4.2.6p5@london-o-lpv-win32-setup.exe file, which can be downloaded at: http://www.meinbergglobal.com/english/sw/ntp.htm
2. Accept the License Agreement.
3. Select the location where you want to place the NTP, then click **Next**.

4. In the Choose Components window, accept the defaults, then click **Next**.
5. In the drop-down list for using a predefined public NTP server, select **None**.
6. Check the box for “Add local clock as a last resort reference, Stratum 12”, then click **Next**.
7. Click **Yes** to verify the configuration.
8. Click **No** when asked if you want to review the generated config file.

![Image of Network Time Protocol Setup](image1)

9. Select the System account radio button (even though it is not recommended), then click **Next**.

![Image of Network Time Protocol Setup: NTP Service Options](image2)

10. Click **Finish**.

![Image of Network Time Protocol Setup: Completing the Network Time Protocol Setup Wizard](image3)

At this point, the server IP address can be used in the NTP address field for the SynapSense Intelligent Gateway. See **Device Manager Tab**.
Solution 2: During the initial software installation (while running as Administrator), use the Windows Time Service W32TM commands to synchronize the local time on the SynapSense Server to an external reference, such as time.nist.gov. This requires the server to have access to an external DNS (or proxy) during the initial setup. If you are unfamiliar with the command line interface, please contact SynapSense Customer Support for assistance.

Use the Command Prompt in Windows to run the following steps.

1. Net start w32time
2. W32tm /config /syncfromflags:manual /manualpeerlist:"time.nist.gov"
3. W32tm /config /reliable:yes
4. W32tm /config /update
5. W32tm /resync
6. Net stop w32time
7. Net start w32time

Issue: The Status LED keeps blinking RED after starting Device Manager.

Solution: If the specified NTP server is not available or if Device Manager failed to start, the Status LED will continue to blink RED. To determine the reason, check the log on Device Manager tab. The following conditions can occur:

Device Manager has failed to start: Status LED blinks RED, log shows an exception stack trace. Call SynapSense Customer Support.

NTP server is not available: Status LED blinks RED, Local time field at the top left corner displays date in year 1970, Device Manager log displays “System time check” errors.

Unable to connect to Environment Server: Status LED will blink RED only if there were no prior connections to Environment Server (for example, Device Manager is started for the very first time on this Gateway); the log will display reconnection attempts. Otherwise, Device Manager will start normally with the latest known configuration, the LED will eventually go into solid YELLOW (the log will continue to display reconnection attempts).