SKF Axios

User Manual
Part Number **15V-090-00097-100**
Revision **A – June 2022**

> ⚠ Read this manual carefully before using the product. Failure to follow the instructions and safety precautions in this manual can result in serious injury, damage to the product or incorrect readings. Keep this manual in a safe location for future reference.

Product Registration

Please take a moment to register your product to receive exclusive benefits offered only to our registered customers, including technical support, tracking your proof of ownership and staying informed about upgrades and special offers. (Please visit our website for more details on these benefits.)

General Product Information

General information such as datasheets and catalogues are published on the Condition Monitoring Systems site on SKF.com. Supporting product information can also be downloaded from the SKF Technical Support self-service web portal.

Product Support Contact Information

Product Sales – For information on purchasing condition monitoring products, services and support on products out of warranty, please contact your local SKF sales office or distributor.

Technical Support – SKF's Technical Support Group can be reached during normal business hours via phone. Always check the self-service web portal before contacting your nearest Technical Support Group (TSG) to see if the answer is already published. You may search the vast knowledge base within the self-service web portal for answers to commonly asked questions (FAQ), how-to articles, technical specs, installation and user manuals, best practices and more.

If further assistance is needed, click on **Open a support case** from within the self-service web portal.

Otherwise, *TSG* can be reached during normal local business hours by phone, and live chat (login required).

Customers in Europe, Middle East and Africa:
- Phone: +46 31 337 6500
- E-Mail: TSG-EMEA@skf.com
- Chat: www.skf.com/cm/tsg

Customers in the Americas, Asia and all other locations:
- Phone: 1-858-496-3627 or toll-free (USA) 1-800-523-7514
- E-Mail: TSG-Americas@skf.com
- Chat: www.skf.com/cm/tsg

4 Setting up and managing Wi-Fi Gateways

SKF Axios uses SKF Axios Gateways to transfer the data collected by the SKF Axios Sensors to the AWS Cloud. Gateways are usually positioned in facilities within 20 to 30 meters (65 to 98 feet) of the sensors. They communicate with the sensors over Bluetooth Low Energy (BLE) and with the AWS Cloud over Wi-Fi or Ethernet.

This section explains how to install your Wi-Fi gateway. It also explains how to delete a gateway.

To learn about using SKF Axios with Ethernet gateways, see Setting up and managing Ethernet gateways.

4.1 Understanding the Wi-Fi Gateway

The SKF Axios Gateway is easy to install and operate. After plugging in the power cable, you can put the gateway in commissioning mode by pressing the CONFIG button.
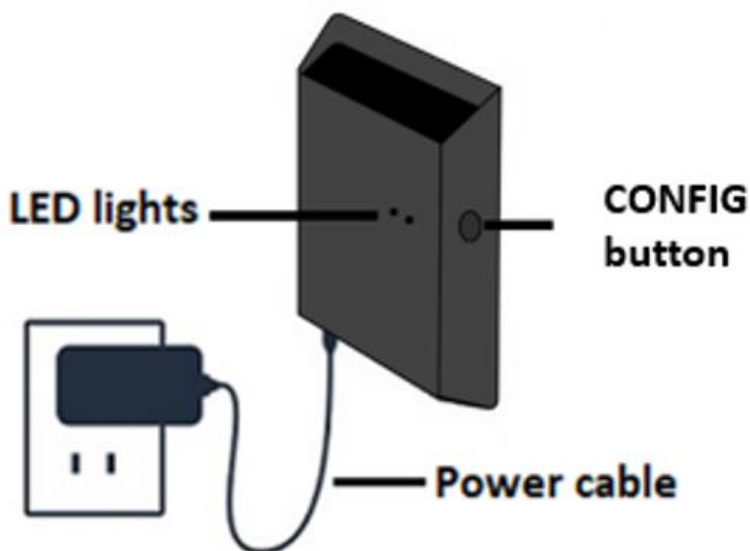

Figure 15   Wi-Fi Gateway overview

4.2 Reading the lights on a Wi-Fi Gateway

The LED lights on the top of your SKF Axios Wi-Fi Gateway indicate the status of the gateway. Each LED light has one orange light and one blue light. The orange light indicates that the gateway is connected to a Wi-Fi network. The blue light indicates that the gateway's Bluetooth is connected to the sensors.

	LED Sequence	Description
1	Solid orange light	The gateway is connected to a Wi-Fi network.
2	Flashing orange light	The gateway is attempting to connect to a Wi-Fi network.
3	Solid blue light	At least one sensor is communicating with the gateway.
4	No blue light	No sensors are currently communicating with the gateway.
5	Both lights flashing (slowly)	The gateway is powered on, but not comissioned.
6	Both lights flashing (rapidly)	The gateway is on and in commissioning mode. Therefore, it is discoverable and configurable. However, it is not yet linked to any sensors.
7	No lights	The gateway is not connected to a power source.
8	Solid orange and blue lights	The gateway is starting up.

Figure 16   LED Sequence description – Wi-Fi Gateway

4.3 Important network considerations

Communicate these requirements to your IT Department to get started

- Firewall rules:
  - Allow connection to amazonaws.com and subdomains
  - TCP Port: **8883** needs to be open
- DHCP is the operating mode
- 2.4 GHz frequency band
- Does not work with the captive portal; requires network name and password

4.4 Placing and installing a Wi-Fi Gateway

Unlike sensors, a Wi-Fi gateway doesn't need to be attached to the machines that are being monitored. However, it does need an available Wi-Fi network through which SKF Axios can connect to the AWS Cloud.

Figure 17   Wi-Fi Gateway

Choosing a location for your gateway

You can install a gateway almost anywhere within your facility, depending on its layout. (For additional guidance, please see Appendix D Gateway Considerations). Typically, gateways are mounted on a wall, but you can mount them on the ceiling, on pillars, or in almost any other location. A gateway must be within 20 to 30 meters (65 to 98 feet) of the sensors it supports. It also must be close enough to a power outlet that it can be plugged in.

Consider these other factors when mounting a gateway:

- Mounting the gateway higher than sensors (2 meters (7 feet) or more) can improve coverage.
- Keeping an open line of sight between the gateway and sensors improves coverage.
- Avoid mounting the gateway on building structures, such as exposed steel beams. They can cause interference with the signal.
- Try to work around any equipment that might produce electronic interference with the signal.
- If possible, install more than one gateway within transmission distance of your sensors. If a gateway becomes unavailable, the sensors will switch their data transmission to another gateway. Having multiple gateways helps to reduce data loss. There is no minimum required distance between two gateways.

Mounting the bracket

To install a gateway, position the wall mounting bracket on the wall or on another location, then mount the gateway on the bracket.
Almost everything you need comes in the box that contains the gateway:

- The gateway
- An AC adapter
- AC adapter plugs for the EU, UK, and US
- The wall mounting bracket
- Double-sided tape
- Two mounting screws
- One small screw to attach the gateway to the bracket

There are three ways to mount the mounting bracket: screw mounting, tape mounting, and plastic-tie mounting. The method you use depends on whether you're mounting the gateway on a wall or another location, and on the surface material. You can mount the gateway on the wall mounting bracket through the small screw hole in the center of one of the short sides.

To mount the bracket, choose one of the following techniques.

Screw mounting

Typically, you mount the bracket directly to the wall using the mounting screws included in the gateway box. Mount the bracket from the front. You might need to use an expansion plug or toggle bolt to secure the screw in the wall. An expansion plug or toggle bolt is not included.

Figure 18   Screw mounting

Tape mounting

A shaped piece of double-sided tape is included in the gateway box. Use it when you can't place a screw into the mounting surface. You can also use it in combination with the other methods of mounting for a more secure installation.

Remove the backing on one side of the tape and apply the tape to the back of the wall mounting bracket between the four raised sections.

Remove the remaining backing and apply the bracket to the mounting location. Press hard on the bracket to make sure that the tape firmly adheres to the surface.

Figure 19   Tape mounting

Plastic-tie mounting

To mount a gateway to a smaller non-wall location, such as a pillar or fencing, use cable ties (also known as zip ties) to fasten the wall mounting bracket. Put the ties through the holes in the four raised sections on the back of the bracket. wrap them around the mounting location and pull tight.

After the bracket is mounted, attach the gateway to the bracket.

Figure 20   Plastic-tie mounting

Mounting the gateway on the bracket

In the following procedure, we talk about the "top" and "bottom" of the gateway and the bracket. The two images below demonstrate this standard orientation. As noted below, the device does not have to be upright in order to function. This explanation is to help you understand the mounting instructions.

When the gateway is upright, the SKF logo on the front of the device is right-side up. The two holes that will reveal the LEDs are just above the logo, on the right side. The hole for the small screw that will attach the bracket to the gateway is at the top, in the center.

Figure 21   Wi-Fi Gateway

On the back of the device, there are two pairs of black plastic hooks. The large hooks, near the bottom of the device, point downward. The small hooks, near the top of the device, point upward.

1. With the wall mounting bracket in place, place the gateway against the bracket. The two large plastic hooks on the back of the gateway should be in the slots at the bottom of the bracket.
2. Press the top of the gateway against the bracket so that the two small plastic hooks on the back of the gateway latch into the top of the bracket.
3. Using the small screw that came with the gateway, fasten the gateway to the bracket through the hole at the top of the gateway.

4. Insert the appropriate AC plug into the AC adapter.
5. Plug the AC adapter into the bottom of the gateway and a power outlet.

When the LED lights on the gateway blink slowly, alternating orange and blue, the gateway is turned on and ready to be commissioned.

Note: The gateway is designed to be mounted with the small screw securing it at the top. However, installing it upside down does not affect its performance.

If you have problems connecting to your gateway, see Troubleshooting Wi-Fi gateway detection.

4.5 Commissioning a Wi-Fi Gateway

Once your gateway is mounted in your facility, use the SKF Axios mobile app to commission it. SKF Axios supports only smartphones using

- Android 8.0 or higher
- iOS 14 or higher with Near Field Communication (NFC) and Bluetooth.

To commission a gateway

1. If Bluetooth isn't already turned on for your smartphone, turn it on.
2. Position your gateway in the location that works best for communicating with your sensors. For additional help with locating a place for your gateway, see Placing and installing a Wi-Fi gateway.
3. Plug in the gateway and make sure the LED lights on top are blinking alternatively orange and blue.

4. Push the button on the side of the gateway to put it into commissioning mode. The lights will start rapidly blinking.
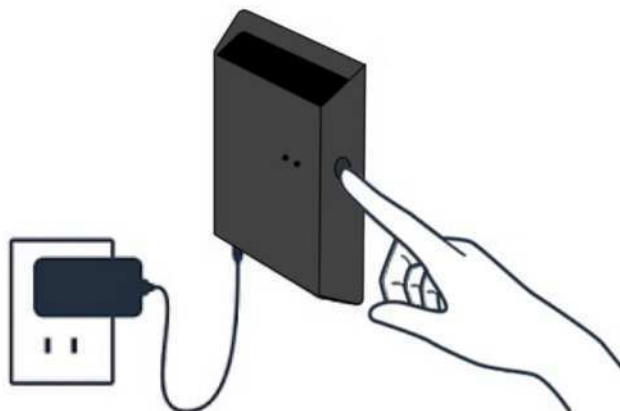
5. Stay within 5 meters (16 feet) of the Wi-Fi Gateway.
6. Open the mobile app on your smartphone.
7. Choose the menu icon (☰). Go to **Gateways**. Choose **Add Gateway**.
8. SKF Axios searches for the gateway. This can take a few moments. When SKF Axios finds the gateway, it displays it in the gateway list.
9. Choose the gateway.

    Note: If you are using an iOS mobile device, and you have previously paired with this particular gateway, you may need to make your device "forget" the gateway before re-pairing. For more information, see Troubleshooting Bluetooth pairing.

    It can take a few moments for SKF Axios to connect to the new gateway.

    If the mobile app continues to try to connect to the gateway without success, see Troubleshooting Wi-Fi gateway detection.
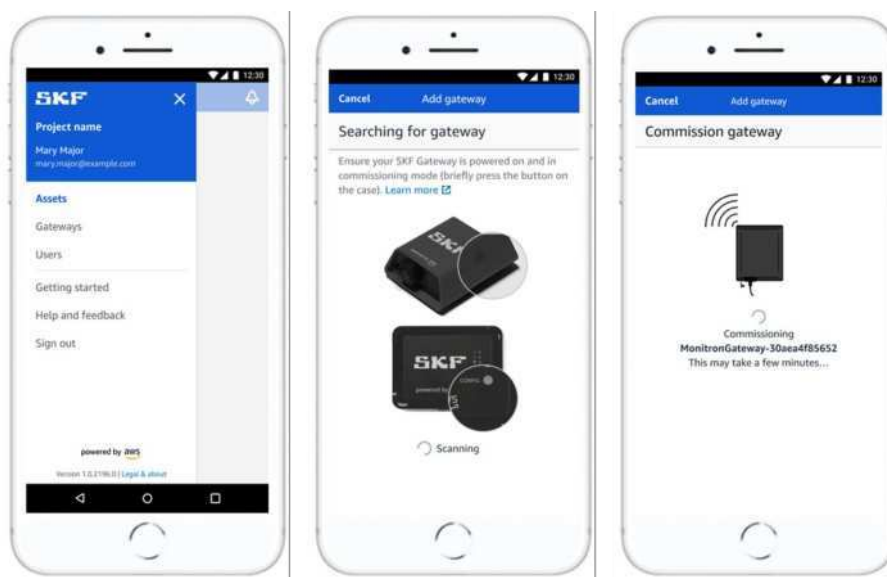
10. After it connects to the gateway, SKF Axios scans for Wi-Fi networks. Choose the Wi-Fi network that you want to use.
11. Enter your Wi-Fi password, and then choose **Connect**. It can take a few minutes for the gateway to be commissioned and connected to the Wi-Fi network. If you have further difficulties, see Resetting the Wi-Fi Gateway to factory settings.

4.6 Troubleshooting Wi-Fi Gateway detection

When you add a gateway to your project or site, as soon as you choose **Add gateway** the SKF Axios mobile app starts scanning to find it. If the mobile app can't find the gateway, try the following troubleshooting tips.

- **Make sure that the gateway is turned on.** Check the LED lights – the two small orange and blue lights next to the SKF symbol on the top of the gateway. If they're on, the gateway has power. If the gateway has no power, check the following:
  - o Is the power cord firmly attached to both the back of the gateway and the power outlet?
  - o Is the power outlet functioning properly?
  - o Is the gateway power cable working? To test this, try using the cable with another gateway.
  - o Is the outlet where the cable plugs into the gateway clean, with no debris stuck inside? Be sure to check both the outlet and the gateway and the connecting end of the cable.

- **Make sure that the gateway is in commissioning mode.** The gateway connects to your smartphone using Bluetooth.
  - o Is your smartphone's Bluetooth on and working? Try switching it off and on. If that doesn't help, restart your phone, and check again.
  - o Are you within your smartphone's Bluetooth range? Bluetooth range is relatively short, usually less than 10 meters (32 feet) and its reliability can vary significantly.
  - o Is there anything that might be interfering electronically with the Bluetooth signal?

If none of these actions resolves the issue, try the following:

1. On your iOS mobile device, choose **Settings**.
2. On your **Settings** screen, choose **Bluetooth**.
3. On the **Bluetooth** screen, choose the information icon next to the name of your SKF Axios Gateway.
4. On the next screen, choose **Forget This Device**.

4.7 Resetting the Wi-Fi Gateway to factory settings

If you reuse a gateway that was deleted from SKF Axios, you use the commissioning button to reset the gateway to factory settings. This prepares the gateway to be used again for SKF Axios.

To reset a gateway to factory settings

1. Unplug the power cord from the gateway.
2. Hold down the commissioning button.
3. Plug the power cord of the gateway back in.
4. When the LED lights start slowly blinking, alternating orange and blue, release the commissioning button.
5. Unplug the gateway, wait 10 seconds, and then plug it back in. The gateway is reset.

4.8 Viewing the list of Gateways
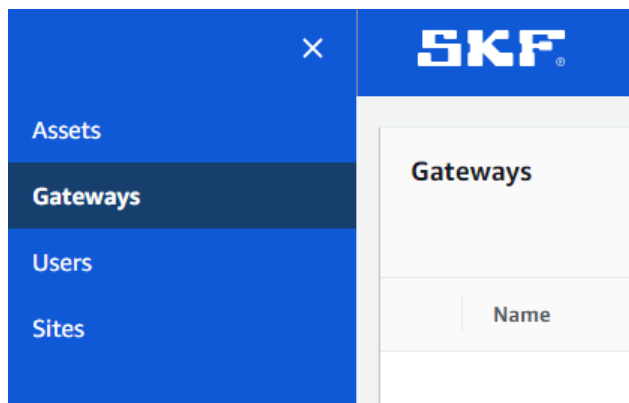
To list your Gateways in the mobile app

1. Use your smartphone to log in to the SKF Axios System mobile app.
2. Choose the menu icon in the upper left corner of the screen.

3. Choose **Gateways**
   a. A list of all gateways associated with the project is displayed.

To list your gateways using the web app

1. Log into the SKF Axios web app.
2. Choose **Gateways** from the left navigation menu.

3. The gateway list appears in the right pane.

4.9 Deleting a Wi-Fi Gateway

Sensors need a gateway to relay their data to the AWS Cloud. Deleting a gateway might cause some sensors to lose their connection. Exercise caution before deleting a gateway.

When you delete a gateway, sensors switch their connection to another gateway that is within range, if there is one. Data transmission from the sensor continues uninterrupted. If no gateway is within range, data transmission is interrupted, and the data might be lost.

To delete a gateway using the mobile app

1. Navigate to the **Gateways** page.
2. Choose the vertical ellipses icon (⋮) next to the gateway you want to delete.
3. Choose **Delete gateway**.
4. Choose **Delete** again.

To delete a gateway using the web app

1. Navigate to the Viewing the list of Gateways.
2. Select the gateway from the table.
3. Choose **Delete gateway**.