

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.

Copyright © 2022 by SKF Group
All rights reserved.

SKF Sverige AB
S-415 50 Gothenburg, Sweden
Telephone: +46 (0) 31 337 10 00



® SKF is a registered trademark of the SKF Group.

POWERED BY AWS is a trademark owned by Amazon Web Services, Inc

The contents of this publication are the copyright of the publisher and may not be reproduced (even extracts) unless prior written permission is granted. Every care has been taken to ensure the accuracy of the information contained in this publication, but no liability can be accepted for any loss or damage whether direct, indirect, or consequential arising out of the use of the information contained herein. SKF reserves the right to alter any part of this publication without prior notice.

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

3 Setting up and managing Ethernet 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 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 Ethernet gateway. It also explains how to delete an Ethernet gateway.

To learn about using SKF Axios with Wi-Fi gateways, see [Setting up and managing Wi-Fi gateways](#).

3.1 Understanding the Ethernet Gateway

SKF Axios Ethernet Gateway comes equipped with an RJ-45 socket, so you can connect it to your Ethernet network using a Cat 5e or Cat 6 Ethernet cable. You will power your gateway over the Ethernet cable, using Power over Ethernet (PoE). Therefore, you will need either a switch or router that supports PoE or a PoE power injector.

After you have inserted an Ethernet cable into your gateway, put the gateway in commissioning mode by pressing the **CONFIG** button.



Figure 10 SKF Axios Ethernet Gateway – Config button

3.2 Reading the lights on an Ethernet Gateway

The LED lights on the top of your SKF Axios Ethernet Gateway indicate the status of the gateway. Each gateway has one orange light, one blue light, and one green light. The green light indicates that the power is on. The orange light

Important network considerations

indicates that the gateway is connected to the ethernet. The blue light indicates that the gateway's Bluetooth is connected to the sensors.

The sequence that the lights display indicates the status of the gateway, as described in the following table.

	LED Sequence	Description
1	Solid green light	The Ethernet gateway is powered on.
2	Solid orange light	The gateway is connected to the Ethernet network.
3	Flashing orange light	The gateway is attempting to connect to the Ethernet network.
4	Solid blue light	At least one sensor is communicating with the gateway.
5	No blue light	No sensors are currently communicating with the gateway.
6	Orange and blue lights flashing (slowly)	The gateway is powered on, but not in commissioning mode.
7	Orange and blue lights flashing (rapidly)	The gateway is on and in commissioning mode, but not yet linked to any sensors. In commissioning mode, the gateway is discoverable and configurable by the SKF System, but no sensors can connect yet.
8	No lights	The gateway is not connected to a power source.
9	Solid orange and blue lights	The gateway is starting up.

Figure 11 LED Sequence description – SKF Axios Ethernet Gateway

3.3 Important network considerations

Note: Communicate these requirements to your IT Department to get started.

- Power Over Ethernet (PoE) or TP link PoE150S injector or equivalent is required to power the device
- Firewall rules:
 - Allow connection to amazonaws.com and subdomains
 - TCP Port: **8883** needs to be open
- DHCP or Static IP

3.4 Placing and installing an Ethernet Gateway

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

Where to place an Ethernet Gateway

You can install a gateway almost anywhere within your work area, depending on its layout. (For additional guidance, please see [Appendix D Gateway Considerations](#)) Typically, gateways are mounted on walls, but you can mount them on ceilings, pillars, or in almost any other location. A gateway must be within 20 to 30 meters (65 to 98 feet) of the sensors it will support, and an

Ethernet gateway must be close enough to an Ethernet cable to plug in. Note that an Ethernet gateway draws power from the Ethernet cable.

Consider these other factors when mounting a gateway:

- Mounting the gateway higher than sensors (2 meters (7 feet) or above) 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 eliminate data loss. There is no minimum required distance between two gateways.

Installing an Ethernet Gateway

Note: Install the gateway with the Ethernet cable going downwards.

Almost everything you need, to install your gateway in your work area is contained in the box that contains the gateway:

- The gateway
- A mounting bracket
- Double-sided tape
- Four mounting screws

To install the gateway, position the mounting bracket on the wall or on another location, then mount the gateway on the bracket, Ethernet cable on the downwards side.

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.

To mount the bracket, choose one of the following.

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

Placing and installing an Ethernet Gateway

use an expansion plug or toggle bolt (not included) to secure the screw in the wall.



Figure 12 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 13 Tape mounting

Plastic-tie mounting

To mount a gateway to a smaller non-wall location, such as a pillar or fence, 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 14 Plastic-tie mounting

Attach the gateway to the bracket

1. With the wall mounting bracket in place, place the gateway against the bracket, with the two plastic hooks on the back of the gateway inserted in the slots at the bottom of the bracket.
2. Press the top of the gateway against the bracket so that the plastic hooks on the back of the gateway latch into the top of the bracket.

3.5 Commissioning an Ethernet Gateway

Once the 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 iOS 14+ with near field communication (NFC) and Bluetooth. For additional help with locating your gateway, see [Placing and installing an Ethernet Gateway](#).

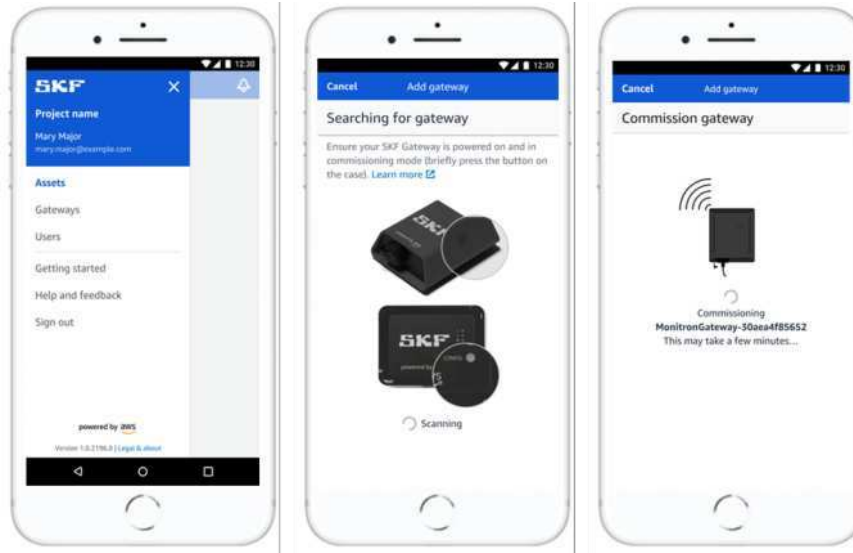
To commission a gateway

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

1. If Bluetooth isn't already turned on for your smartphone, turn it on.
2. Plug the Ethernet cable into the gateway and make sure the network light (orange) and the Bluetooth light (blue) on the front of your gateway are blinking alternately.
3. Push the Config button on the gateway to put it into commissioning mode. The Bluetooth and network LED lights will start flashing rapidly.
4. Stay within 5 meters (16 feet) of the Ethernet Gateway.

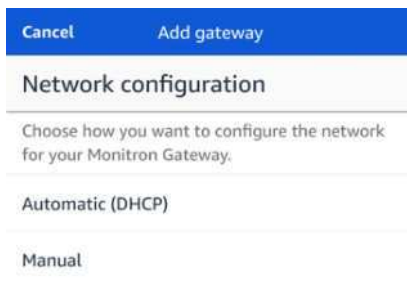
Commissioning an Ethernet Gateway

5. Open the mobile app on your smartphone.
6. Choose the menu icon (☰). Go to Gateways. Choose Add Gateway.
7. 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.
8. Choose the gateway.



If the mobile app continues to try to connect to the gateway without success, see [Troubleshooting Ethernet gateway detection](#).

9. After it connects to the gateway, SKF Axios mobile app will provide two options for you to configure the network connection for your gateway.



10. Choose your network configuration:
 - a. It can take a few minutes for the gateway to be commissioned and to connect to the network.
 - b. If you have further difficulties making the gateway work, it might be helpful to reset it. For more information, see [Resetting the Ethernet gateway to factory settings](#).
 - i. If you choose **Automatic (DHCP)**, SKF Axios mobile app will automatically configure the network to connect to the gateway.
 - ii. If you choose **Manual**, enter your IP address, subnet mask, router, preferred DNS server, and alternate DNS server (optional) information. Then choose **Connect**.



3.6 Troubleshooting Ethernet 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 for the gateway. If the app can't find the gateway, try the following troubleshooting tips.

- **Make sure that the gateway is powered up.** Check the green light near the upper right corner of the gateway. If it's on, the gateway has power. If the gateway has no power (no solid green light), check the following:
 - Is the switch or router at the other end of the Ethernet cable functioning properly?
 - Is the Ethernet cable working? To test this, try using the cable with another gateway.
 - Is the RJ-45 socket clean? Be sure to check the socket at the other end of the Ethernet cable.

- **Make sure the gateway is in commissioning mode.** The SKF Axios mobile app finds a new gateway only when it's in commissioning mode. When you turn a gateway on, the **Bluetooth** and **Network** LED lights blink slowly, alternating orange and blue. When you press the **Config** button to enter commissioning mode, the Bluetooth and Network LED lights blink rapidly, again alternating orange and blue.



1. If the LEDs show any sequence other than slow blinking before you press the button, the gateway might not go into commissioning mode. In this case, reset the gateway by pressing the **RESET** button.
2. **Ensure your smartphone's Bluetooth is working.** The gateway connects to your smartphone using Bluetooth, so it's a potential source of interruption. Check the following:
 - a. 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.
 - b. 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.
 - c. Is there anything that might be interfering electronically with the Bluetooth signal?

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

- Log out of the mobile app and restart it.
- Perform a factory reset of the gateway by holding down **CONFIG** and pressing **RESET**.

3.7 Troubleshooting Bluetooth pairing

You may find yourself attempting to pair your iOS mobile device with a gateway that it has already paired with. This could happen because the gateway has changed locations, or because the general configuration of your SKF Axios site has been altered.

In that case, tell your iOS mobile device to "forget" its Bluetooth connection with the gateway.

To unpair a gateway from your device:

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**.

3.8 Resetting the Ethernet Gateway to factory settings

If you re-use a gateway that was deleted from SKF Axios mobile app, use the config button to reset the gateway to factory settings. This prepares the gateway to be used again for SKF Axios mobile app.

To reset an Ethernet gateway to factory settings (option 1):

1. Unplug the Ethernet cable from the gateway.
2. Hold down the **Config** button.
3. Plug the Ethernet cable back into the gateway.

When the LED lights start slowly blinking, alternating orange and blue, release the **Config** button. The gateway is reset.

To reset an Ethernet gateway to factory settings (option 2):

1. Hold down the **Config** button.
2. Press the reset button.
3. When the LED lights start slowly blinking, alternating orange and blue, release both buttons.

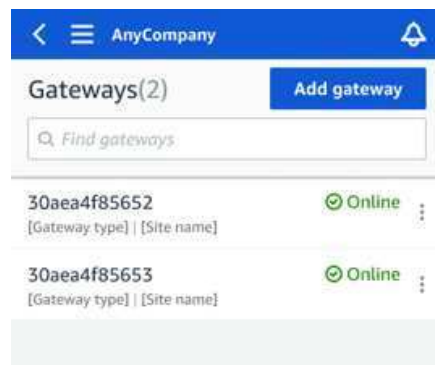
3.9 Viewing the list of Gateways

To list your Gateways in the mobile app

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



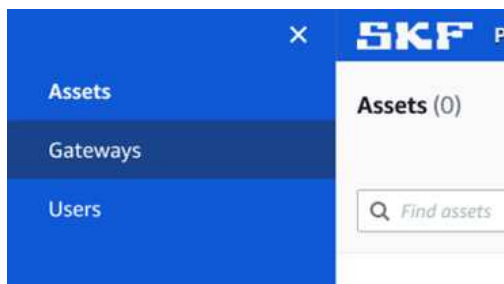
3. Choose **Gateways**
 - a. A list of all gateways associated with the project is displayed.



Deleting an Ethernet Gateway

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.

Name	Physical ID	Status	Site	Gateway type	Network
Pillar A4 Gateway	c22a48puedf	Offline	Site name	WiFi	No internet connection
Customized gateway name	c22a48puedf	Online	Site name	WiFi	567.5 KB 618.5 KB Good
Customized gateway name	c22a48puedf	Online	Site name	Ethernet	567.5 KB 618.5 KB Strong
Customized gateway name	c22a48puedf	Online	Site name	WiFi	567.5 KB 618.5 KB Fair
Gateway-c22a48puedf	c22a48puedf	Online	Site name	WiFi	567.5 KB 618.5 KB Weak
Gateway-c22a48puedf	c22a48puedf	Online	Site name	Ethernet	567.5 KB 618.5 KB

3.10 Deleting an Ethernet 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 within range, if there is one, and 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. Using the mobile app, navigate to the **Gateways** page.
2. Choose the vertical ellipses icon () next to the gateway that 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.