COGNEX

# In-Sight® 7000 Series Vision System

## Optional Configurations

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# Uninstall and Install the M12 Lens

If you purchased a vision system with the pre-installed M12 lens, the lens can be replaced with other M12 lenses. The Cognex Lens Tool accessory (LNS-M12-TOOLKIT) must be used to replace the M12 lens. For more information, contact your Cognex sales representative.

**CAUTION**:

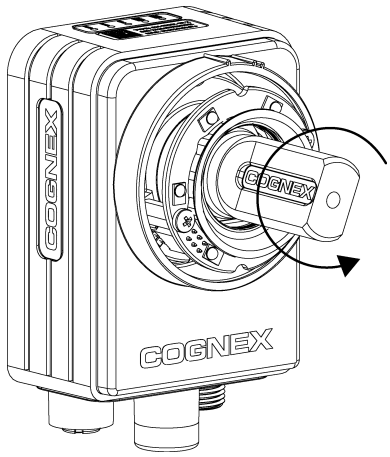
- Using a non-Cognex lens or replacing the M12 lens without the Cognex Lens Tool accessory (LNS-M12-TOOLKIT) may cause damage to the vision system.
- Do not remove the entire lens capsule. Once removed, the lens capsule cannot be re-installed. Unauthorized modifications may void your warranty.

## Uninstall the M12 Lens

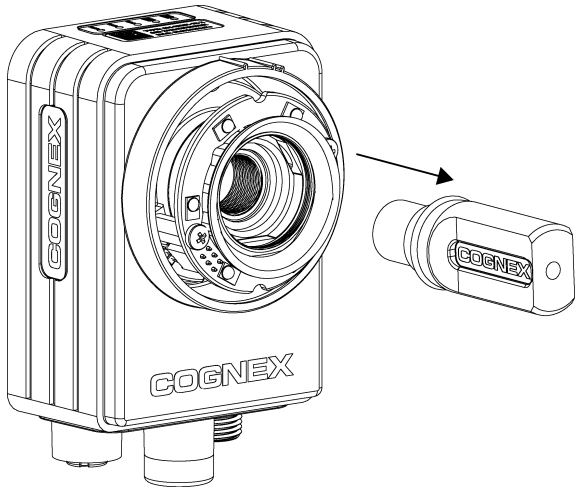
**Tip**: Before disconnecting the power supply of a vision system, it is recommended to move the M12 lens to the furthest out position by setting the Set Focus Position Value parameter to 100 in In-Sight Explorer. For more information on how to set up the focus position, refer to the EditFocusPosition topic in the *In-Sight® Explorer Help* file provided on the In-Sight Explorer DVD.

1. Verify that the 24VDC power supply is unplugged and not receiving power.
2. Remove the lens cover, if present.
3. Place the lens tool directly on the lens, with the padded end of the tool pressed against the lens. The pad will “grab” onto the lens.

4. To loosen the lens, turn the lens tool counter-clockwise.




5. Remove the lens.

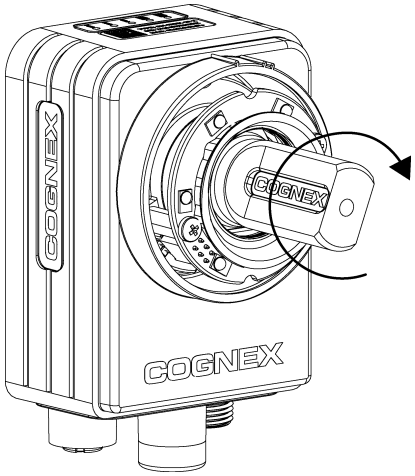


# Install the M12 Lens

1. Verify that the 24VDC power supply is unplugged and not receiving power.
2. Determine the correct lens tool to use, based on the focal length of the lens.

| Lens Focal Length | Cognex Lens Tool |
|---|---|
| 6MM (LM 12-06-02)<br>8MM (LM 12-08-02)<br>12MM (LM 12-12-02)<br>16MM (LM 12-16-02) | Clear Anodized (P/N 820-0233-xR) |
| 25MM (LM 12-25-02) | Black Anodized (P/N 820-0234-xR) |

3. To install the lens, insert the lens and using your fingers, turn it clockwise. If needed, attach the lens tool and finish tightening the lens; the maximum torque is 0.34 Nm (3 in-lb).

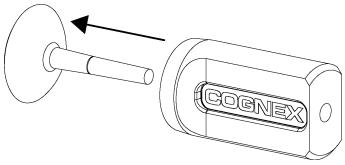



4. Reattach the lens cover.
5. Restore power to the 24VDC power supply and turn it on if necessary.

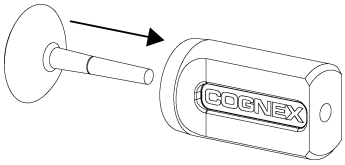
# Replace the Cognex Lens Tool Pad

If the Cognex Lens Tool's Pad tears, it can be replaced using one of the pads included with the lens tool.

1. Grab the edge of the existing pad and pull it out of the lens tool.




2. Using one of the replacement pads included with the lens tool, feed the stem through the lens tool until the pad is resting firmly on the end of the lens tool.



# Install the Lens Filter

If you purchased a vision system with the M12 lens configuration, a filter kit is available for purchase. The filter kit can be used to increase the contrast of images and improve the ability of the vision system to distinguish desired characteristics. For more information, contact your Cognex sales representative.

| Lens Filter Color | Lens Filter Part Number |
|---|---|
| Blue | IMBF-BP470-IS7 |
| Green | IMGF-BP525-IS7 |
| Orange | IMOF-BP590-IS7 |
| Red | IMRF-BP635-IS7 |
| Dark Red | IMRF-BP660-IS7 |
| Infrared | IMIF-BP850-IS7 |

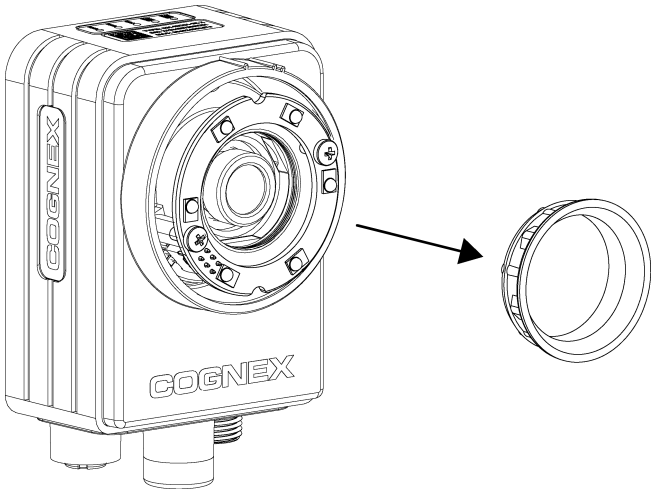
The steps for installing the lens filter vary, depending on whether the vision system you purchased has a shroud. Refer to the table below to determine the installation steps required for your application.

| Configuration | Vision System | Installation Instructions |
|---|---|---|
| Configuration 1 | Vision System with Shroud | Refer to *Install a Lens Filter with a Shroud* on page 9. |
| Configuration 2 | Vision System without Shroud | Refer to *Install a Lens Filter without a Shroud* on page 11. |

# Install a Lens Filter with a Shroud

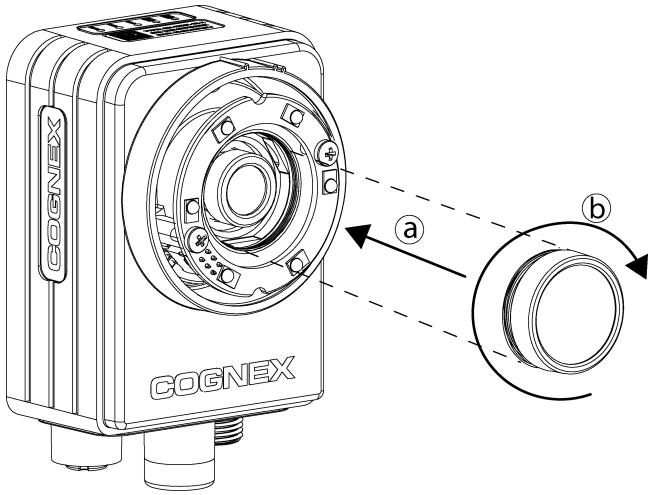
If the vision system you purchased has a shroud, complete the following steps to install the lens filter.

1. Verify that the 24VDC power supply is unplugged and not receiving power.
2. Remove the lens cover, if present.
3. Using your fingers, remove the shroud.

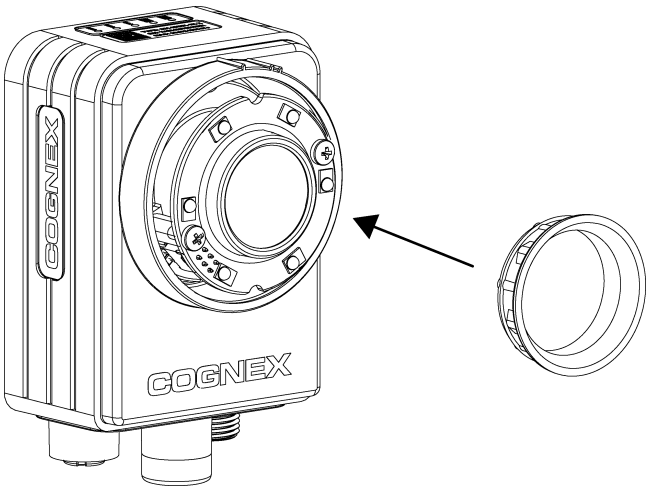



4. Install the lens filter.
    a. Hold the lens filter by the sides, with the threaded end towards the lens. Align the filter with the filter thread on the vision system.
    b. Screw the lens filter onto the vision system by twisting it clockwise until it stops turning.

> **Note**: Make sure to only touch the sides of the filter to avoid leaving fingerprints on the filter.



5. Reinstall the shroud to the vision system. Gently press the shroud down into the vision system.



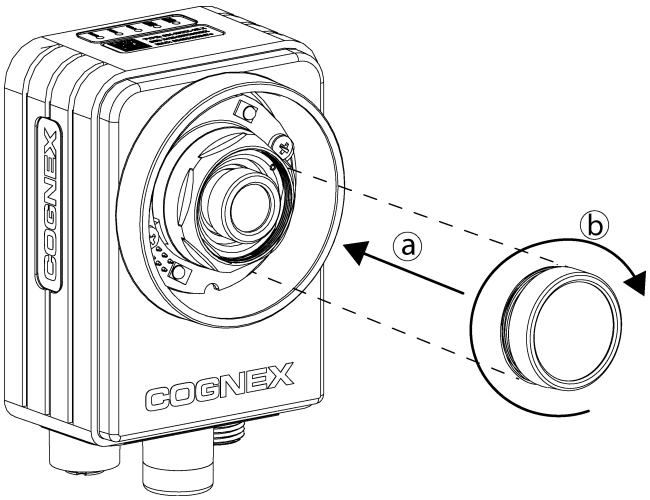

6. Reattach the lens cover.
7. Restore power to the 24VDC power supply and turn it on if necessary.

# Install a Lens Filter without a Shroud

If the vision system you purchased does not have a shroud, complete the following steps to install the lens filter.

1. Verify that the 24VDC power supply is unplugged and not receiving power.
2. Remove the lens cover, if present.
3. Install the lens filter.
    a. Hold the lens filter by the sides, with the threaded end towards the lens. Align the filter with the filter thread on the vision system.
    b. Screw the lens filter onto the vision system by twisting it clockwise until it stops turning.

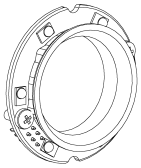
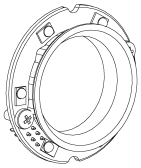
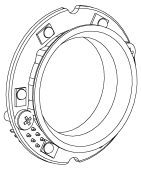
    **Note**: Make sure to only touch the sides of the filter to avoid leaving fingerprints on the filter.




4. Reattach the lens cover.
5. Restore power to the 24VDC power supply and turn it on if necessary.

# Replace the Ring Light

If you purchased a vision system with the M12 lens configuration, the vision system is shipped with an internal LED ring light pre-installed. The steps for replacing the ring light vary, depending on whether the pre-installed ring light and the ring light you purchased have a shroud. Refer to the table below to determine the installation steps required for your application.

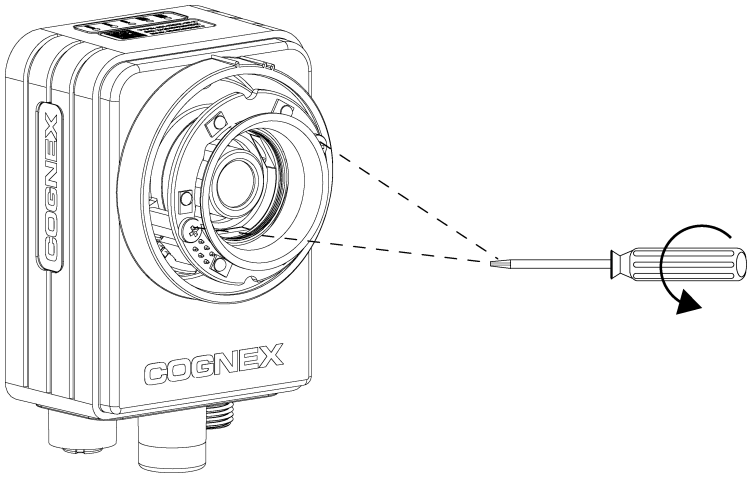
| Configuration | Existing Ring Light | Replacement Ring Light | Installation Instructions |
|---|---|---|---|
| Configuration 1 |  Ring Light with Shroud |  Ring Light with Shroud | Refer to *Replace a Ring Light with a Shroud* on page 13. |
| Configuration 2 | Ring Light without Shroud |  Ring Light with Shroud | Refer to *Convert to a Ring Light with a Shroud* on page 15. |
| Configuration 3 | Ring Light without Shroud | Ring Light without Shroud | Refer to *Replace a Ring Light without a Shroud* on page 18. |

# Replace a Ring Light with a Shroud

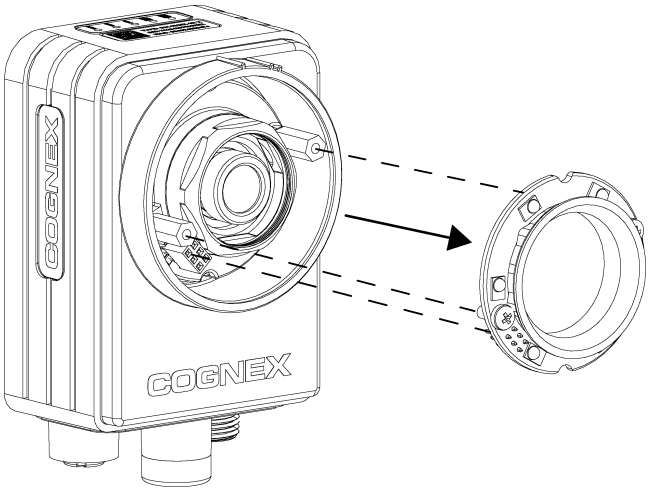
If the pre-installed ring light on your vision system has a shroud, please complete the following steps to replace the ring light.

1. Verify that the 24VDC power supply is unplugged and not receiving power.
2. Remove the lens cover, if present.
3. Loosen the ring light.
   a. Using a screwdriver, loosen the two screws on the ring light.

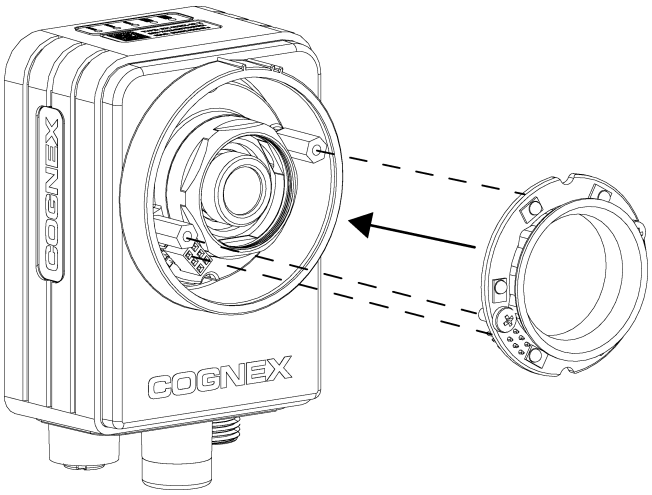
> **Note**: Do not attempt to remove the screws from the ring light; the screws are held in place with washers on the back of the ring light.



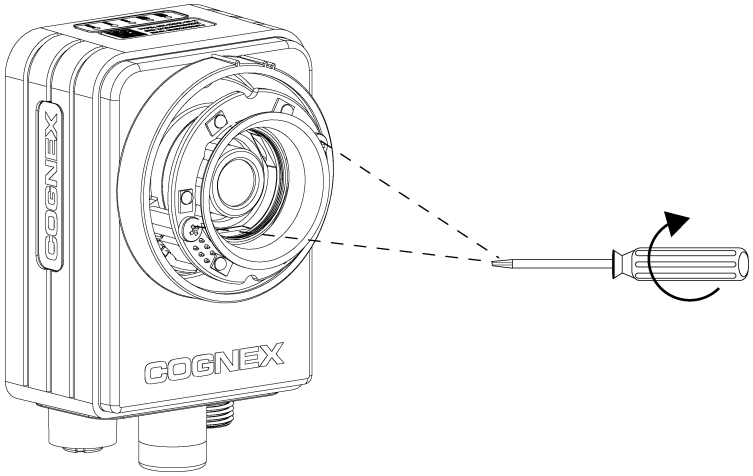

   b. Pins on the back of the ring light are connected to the vision system. Grab the notch on the ring light that is closest to the pins, and gently pull up to disengage the pins from the vision system.
4. Remove the ring light and shroud from the vision system.



5. To install the new ring light, align the screws with the threaded screw posts on the vision system. Also align the pins on the back of the ring light with the connector on the vision system, but do not attempt to connect the pins.




6. Gently press down on the ring light to connect the pins on the back of the ring light to the vision system.
7. Using a screwdriver, tighten the screws until they stop turning; the maximum torque is 0.56 Nm (5 in-lb).




8. Reattach the lens cover.
9. Restore power to the 24VDC power supply and turn it on if necessary.

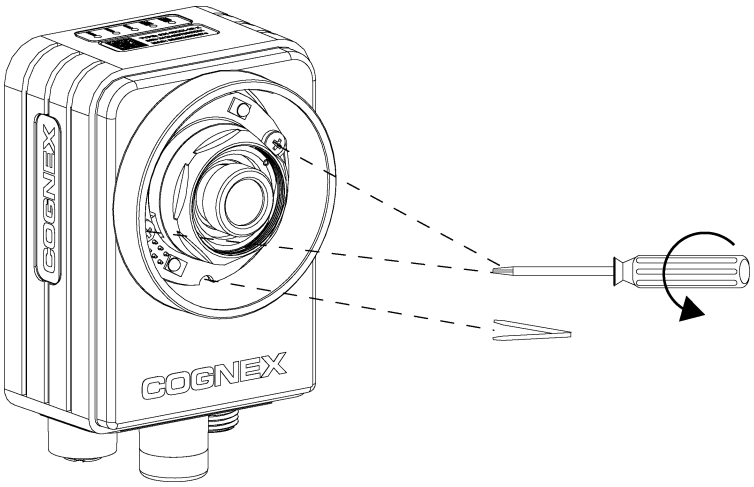
# Convert to a Ring Light with a Shroud

If the pre-installed ring light does not have a shroud, and you need to convert to a ring light with a shroud, please complete the following steps. To install a ring light with a shroud, you must first install the Cognex Standoff and Connector Kit (LM12-UPDATE). For more information, contact your Cognex sales representative.

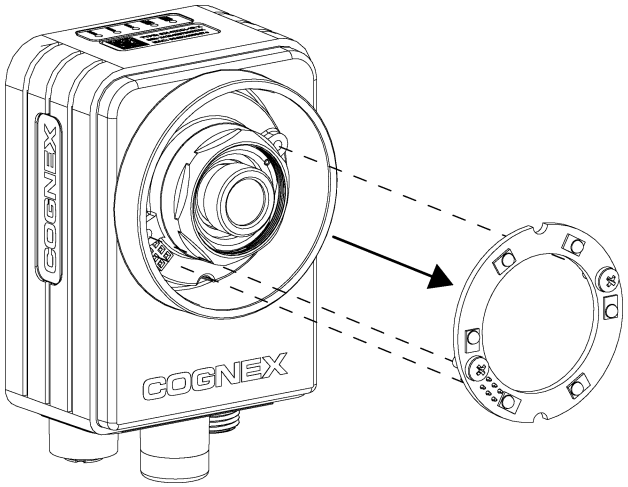
1. Verify that the 24VDC power supply is unplugged and not receiving power.
2. Remove the lens cover, if present.
3. Loosen the ring light.
   a. Using a screwdriver, loosen the two screws on the ring light.

   > **Note**: Do not attempt to remove the screws from the ring light; the screws are held in place with washers on the back of the ring light.

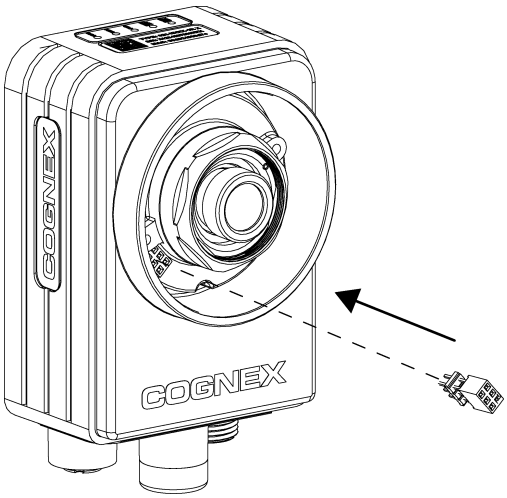
   b. Pins on the back of the ring light are connected to the vision system. Using small tweezers, grab the notch on the ring light that is closest to the pins, and gently pull up to disengage the pins from the vision system.



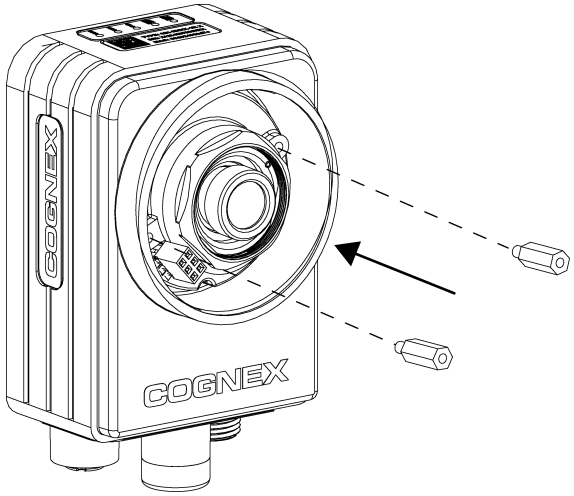

4. Remove the ring light from the vision system.



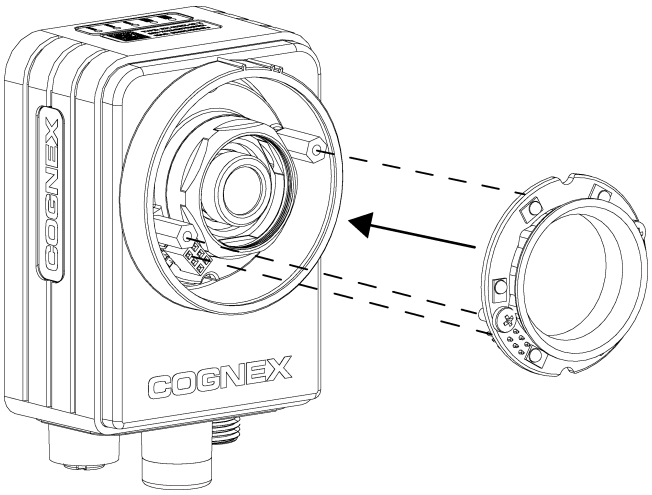
5. Install the Cognex Standoff and Connector Kit (LM12-UPDATE).
   a. Insert the light connector into the connector on the vision system.



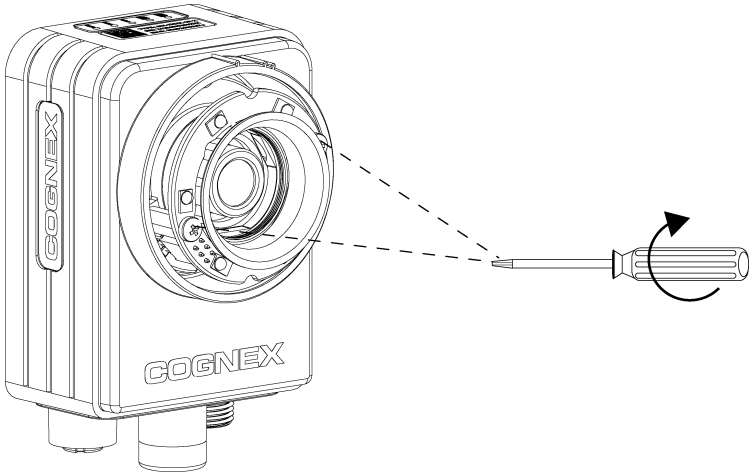

   b. Align the posts with the threaded screw holes on the vision system. Using a post wrench, tighten the posts until they stop turning; the maximum torque is 0.56 Nm (5 in-lb).



6. To install the new ring light, align the screws with the threaded screw posts on the vision system. Also align the pins on the back of the ring light with the connector on the vision system, but do not attempt to connect the pins.




7. Gently press down on the ring light to connect the pins on the back of the ring light to the vision system.
8. Using a screwdriver, tighten the screws until they stop turning; the maximum torque is 0.56 Nm (5 in-lb).




9. Reattach the lens cover.
10. Restore power to the 24VDC power supply and turn it on if necessary.

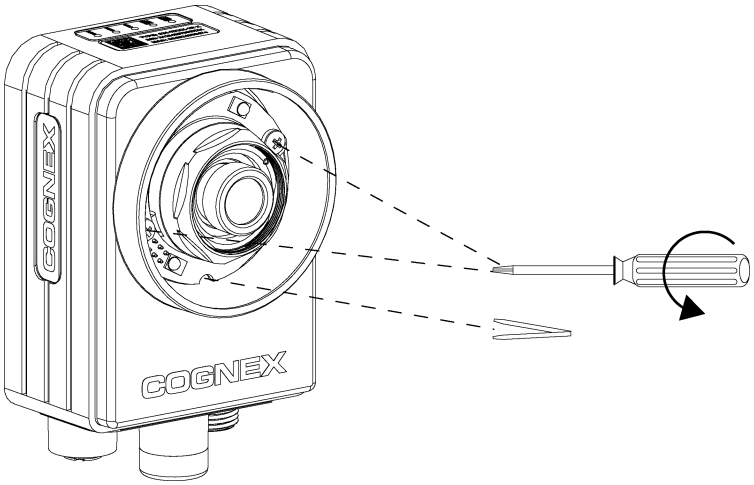
# Replace a Ring Light without a Shroud

If the pre-installed ring light on your vision system does not have a shroud, and you need to replace it with another ring light that also does not have a shroud, please complete the following steps.

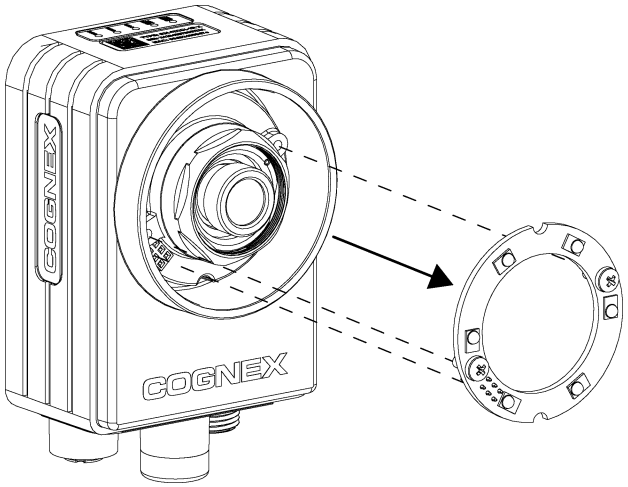
1. Verify that the 24VDC power supply is unplugged and not receiving power.
2. Remove the lens cover, if present.
3. Loosen the ring light.
   a. Using a screwdriver, loosen the two screws on the ring light.

   > **Note**: Do not attempt to remove the screws from the ring light; the screws are held in place with washers on the back of the ring light.

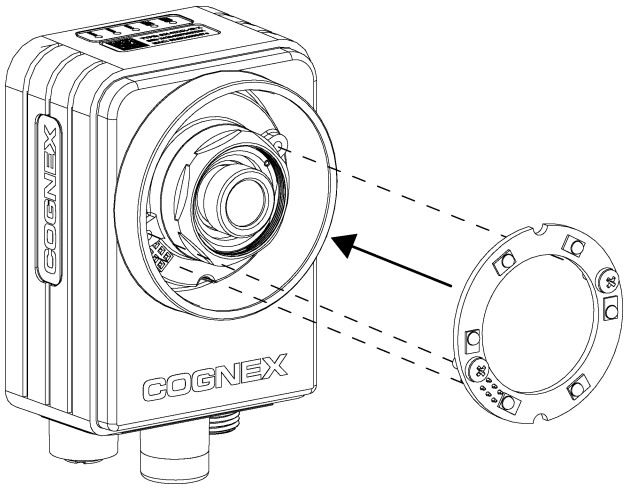
   b. Pins on the back of the ring light are connected to the vision system. Using small tweezers, grab the notch on the ring light that is closest to the pins, and gently pull up to disengage the pins from the vision system.



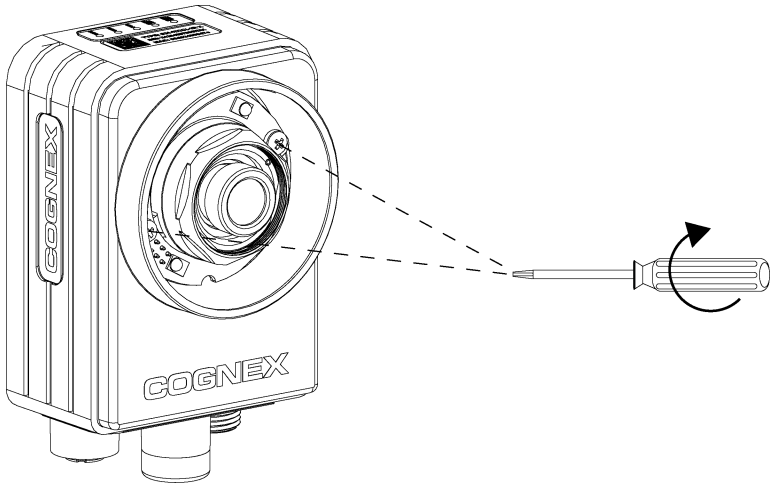

4. Remove the ring light from the vision system.



5. To install the new ring light, align the screws with the threaded screw holes on the vision system. Also align the pins on the back of the ring light with the connector on the vision system, but do not attempt to connect the pins.




6. Using a screwdriver, tighten the screws until they are partially threaded.




7. Gently press down on the ring light to connect the pins on the back of the ring light to the vision system.

**CAUTION**: If the screws are not partially threaded prior to connecting the pins, the pins may bend or break.

8. Using a screwdriver, finish tightening the screws.
   a. If installing a ring light that uses nylons screws, gently tighten the screws until a slight change in resistance is detected.

      **CAUTION**: Use caution when tightening the nylon screws, to ensure the screws do not become stripped.

   b. If installing a ring light that uses stainless steel screws, the maximum torque is 0.56 Nm (5 in-lb).
9. Reattach the lens cover.
10. Restore power to the 24VDC power supply and turn it on if necessary.

# Convert from the M12 Lens to the C-Mount Lens

If you purchased a vision system with the pre-installed M12 lens, the M12 lens can be replaced with a C-Mount lens. Please complete the following steps to convert from the M12 lens to the C-Mount lens.

⚠ **CAUTION**: The conversion is irreversible. Once the vision system is converted from the M12 lens to the C-Mount lens, it cannot be converted back to the M12 lens.

# Uninstall the Ring Light

The steps for uninstalling the ring light vary, depending on whether the pre-installed ring light has a shroud.

| Configuration | Vision System | Installation Instructions |
|---|---|---|
| Configuration 1 | Vision System with Shroud | Refer to *Uninstall a Ring Light with a Shroud* on page 21. |
| Configuration 2 | Vision System without Shroud | Refer to *Uninstall a Ring Light without a Shroud* on page 23. |

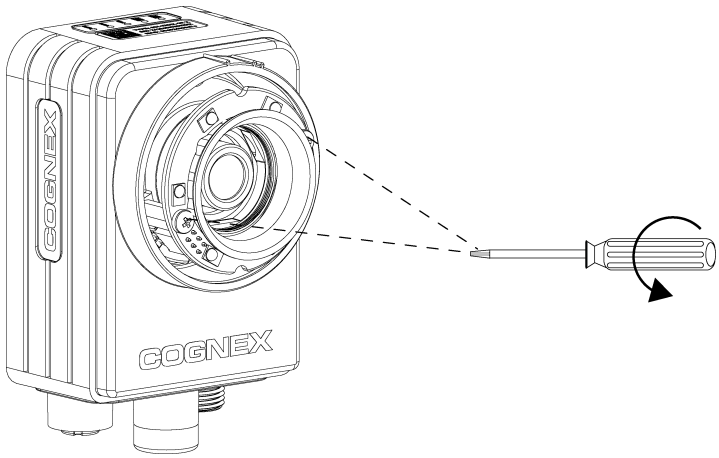
## Uninstall a Ring Light with a Shroud

If the pre-installed ring light on your vision system has a shroud, please complete the following steps to remove the ring light.

1. Verify that the 24VDC power supply is unplugged and not receiving power.
2. Remove the lens cover, if present.

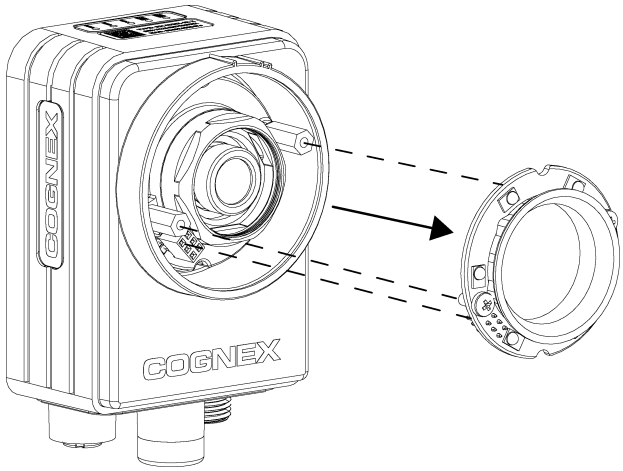
3. Loosen the ring light.
   a. Using a screwdriver, loosen the two screws on the ring light.

> **Note**: Do not attempt to remove the screws from the ring light; the screws are held in place with washers on the back of the ring light.

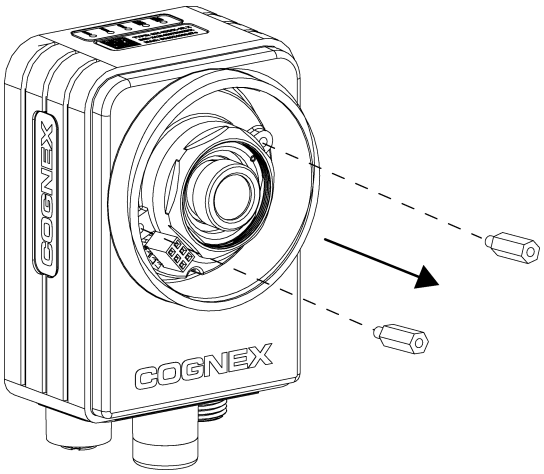



   b. Pins on the back of the ring light are connected to the vision system. Grab the notch on the ring light that is closest to the pins, and gently pull up to disengage the pins from the vision system.

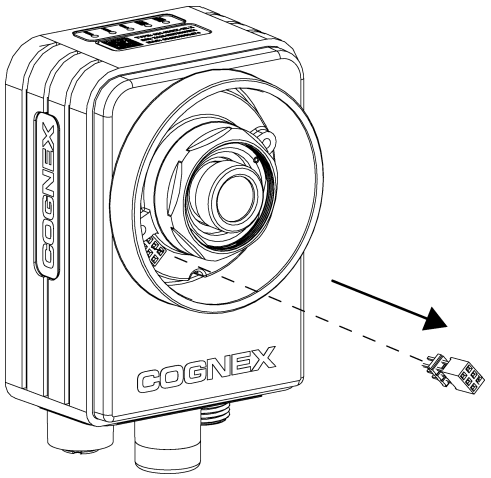
4. Remove the ring light and shroud from the vision system.



5. Remove the posts from the vision system.




6. Remove the light connector from the vision system.




## Uninstall a Ring Light without a Shroud

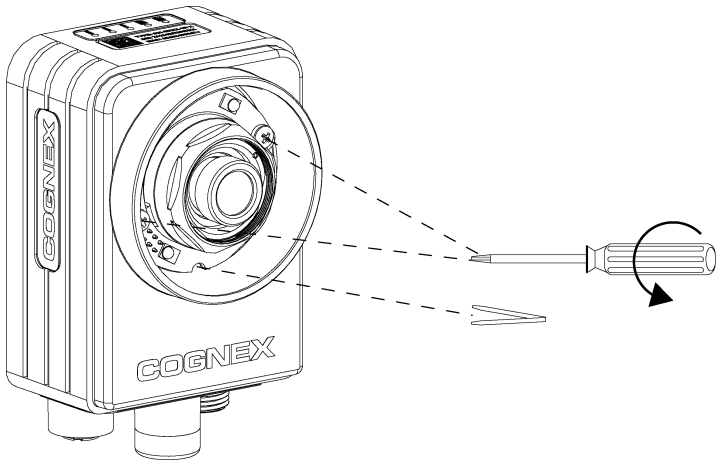
If the pre-installed ring light on your vision system does not have a shroud, please complete the following steps to remove the ring light.

1. Verify that the 24VDC power supply is unplugged and not receiving power.
2. Remove the lens cover, if present.

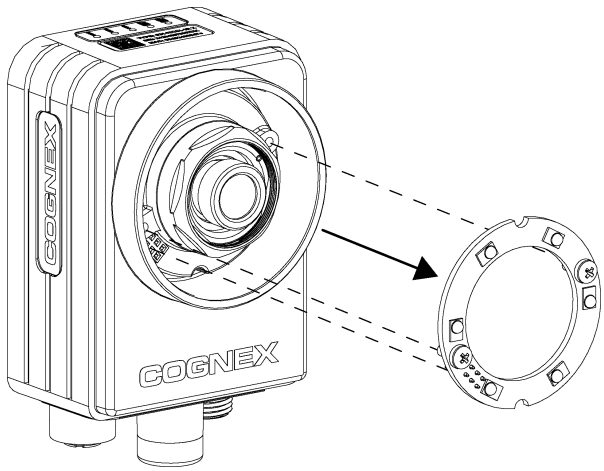
3. Loosen the ring light.
   a. Using a screwdriver, loosen the two screws on the ring light.

   **Note**: Do not attempt to remove the screws from the ring light; the screws are held in place with washers on the back of the ring light.

   b. Pins on the back of the ring light are connected to the vision system. Using small tweezers, grab the notch on the ring light that is closest to the pins, and gently pull up to disengage the pins from the vision system.



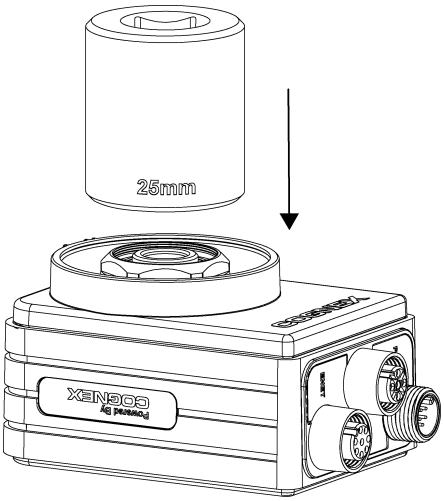

4. Remove the ring light from the vision system.



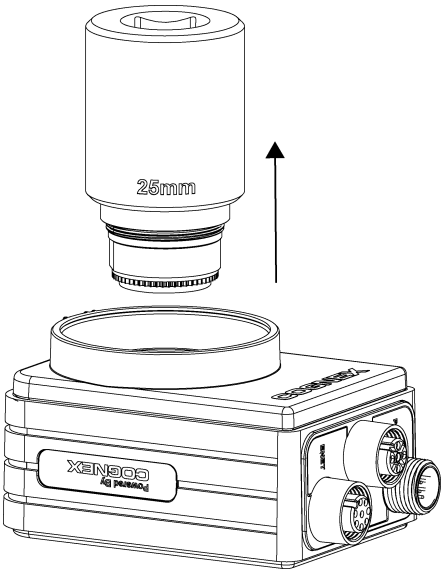
# Uninstall the M12 Lens Capsule

1. Position a 25mm hex socket on the lens capsule.

> **Note**: The 25mm hex socket is used to remove the entire lens capsule. Do not use the Cognex lens tool to remove only the M12 lens when converting from the M12 lens to the C-Mount lens.




2. To loosen the lens capsule, turn the hex socket counter-clockwise.
3. Remove the entire lens capsule.



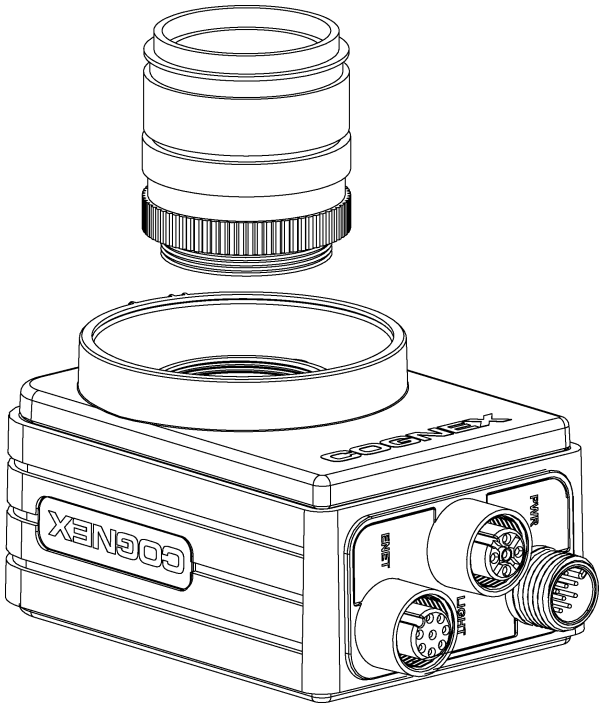

4. Discard the lens capsule.

> **Note**: Once removed, the lens capsule must be discarded and cannot be re-installed in another vision system.

# Install the C-Mount Lens

**Note**: Autofocus is not supported for the C-Mount lens configuration.

1. Attach a C-Mount lens to the vision system.The exact lens focal length needed depends on the working distance and the field of view required for your machine vision application.

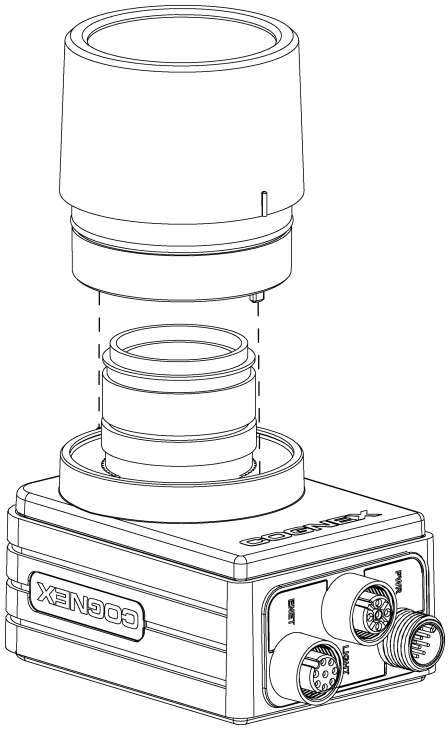


2. If using a lens cover, attach the lens cover to the vision system.

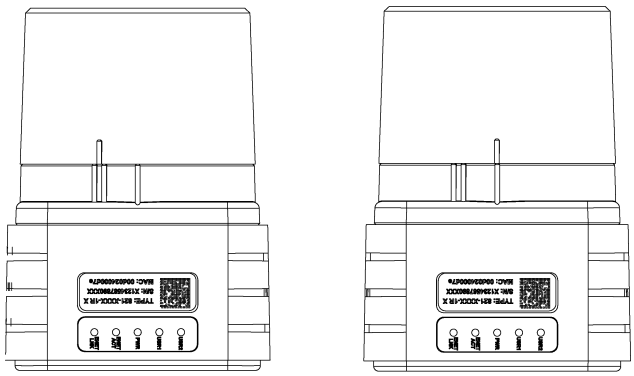
**Note**: The lens cover for C-Mount lens is available for purchase separately. For more information, please contact your Cognex sales representative.

a. Align the keys on each side of the lens cover with the notches on the vision system, then push the lens cover down to the vision system until it stops moving.

**CAUTION**: The lens cover is "keyed" to fit the vision system; do not force the connections or damage may occur.




b. Turn the lens cover clockwise until it is in the locked position.



Locked Position

Unlocked Position

# Install the Lighting Bracket

The lighting bracket kit can be used to attach the external LED bar lights to the vision system to provide an integrated and flexible lighting solution. The lighting bracket kit is available for purchase as an optional accessory.

**Note**: The external LED bar lights and cables are sold separately. For a complete list of available LED bar lights, please contact your Cognex sales representative.

## Lighting Bracket Kit

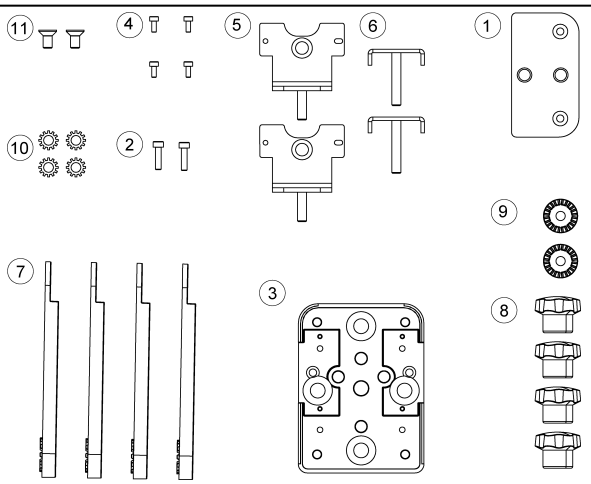
| Part Number | Linear Increment | Angular Increment |
|---|---|---|
| BKT-7K-04 | 5.5 mm | 30° |

## Cables

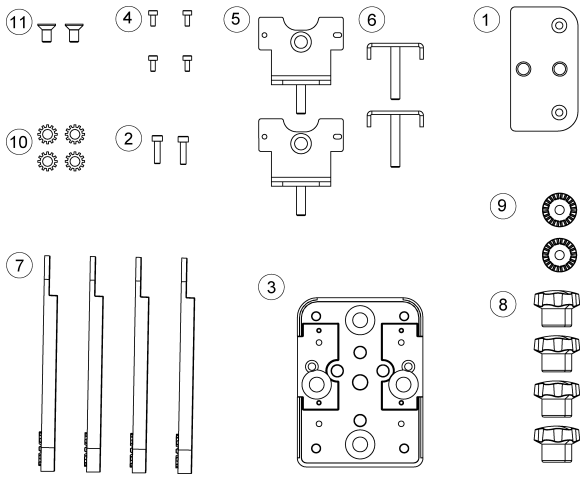
| Part Number | Description |
|---|---|
| IC00-ADAP-02 | Single light connection |
| IC00-ADAP-03 | Dual light connection |

## Lighting Bracket Kit Components

The lighting bracket kit is shipped with the components listed below.

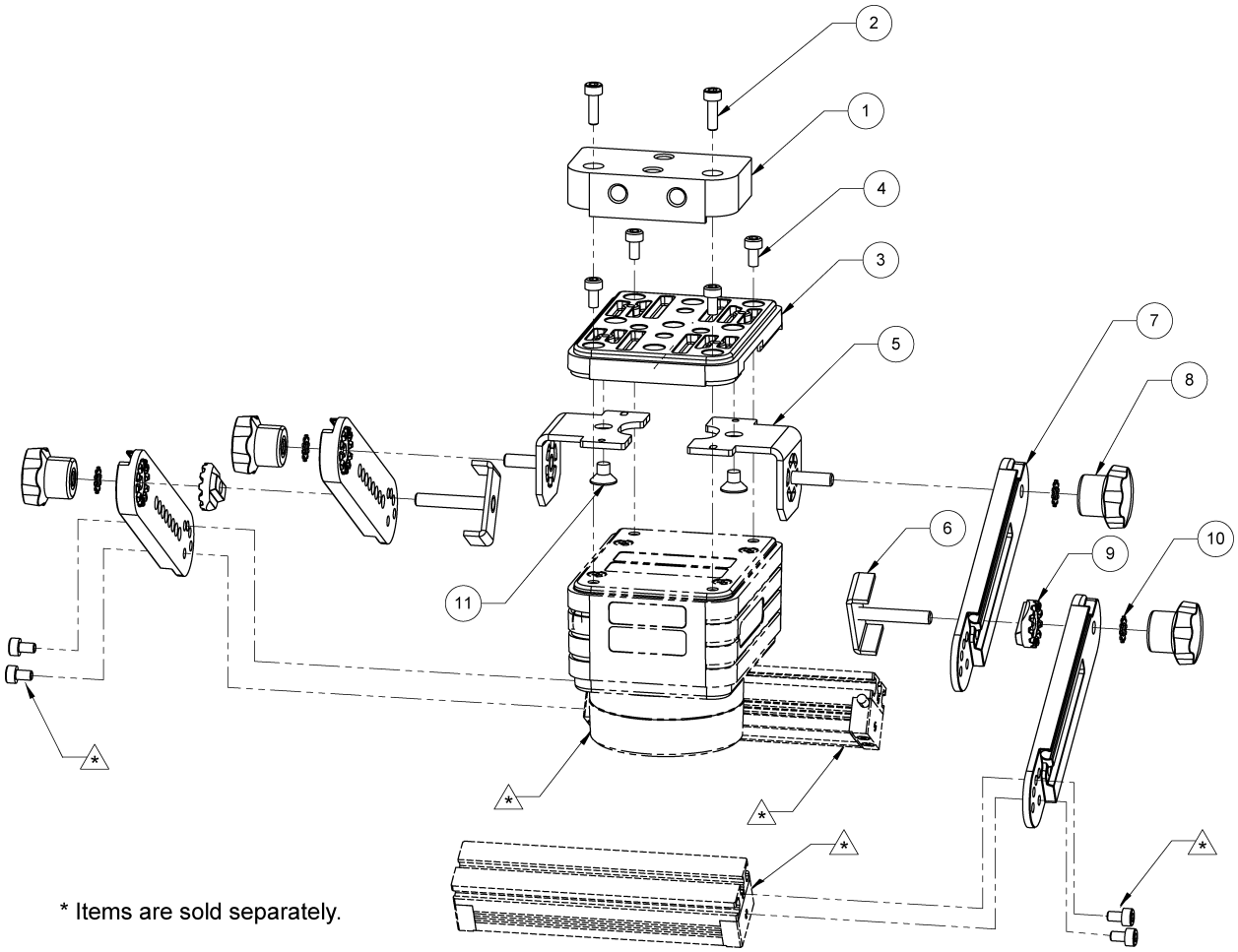



| Item # | Description (Qty) |
|---|---|
| 1 | Small mounting bracket (1) |
| 2 | M3x12 socket head cap screws (2) |
| 3 | Mounting bracket plate (1) |
| 4 | M3x6 socket head cap screws (4) |
| 5 | 90° arm-base mounting brackets (2) |
| 6 | Pivot brackets (2) |
| 7 | Lighting bracket arms (4) |




| Item # | Description (Qty) |
|---|---|
| 8 | Star knobs (4) |
| 9 | Pivot rotation keys (2) |
| 10 | M4 external tooth washers (4) |
| 11 | M4x5 socket head flat head screws (2) |

# Installation Procedure




* Items are sold separately.

1. Attach both parts of the 90° arm-base mounting bracket (item 5) to the mounting bracket plate (item 3) using M4x5 screws (item 11).
2. Attach the assembly to the In-Sight 7000 series vision system using M3x6 screws (item 4).

   **Note**: If using small mounting bracket (item 1), attach the assembly to the In-Sight 7000 series vision system using only two of the M3x6 screws (item 4). Then attach the small mounting bracket to the mounting bracket plate (item 3) using M3x12 screws (item 2).

3. Place the lighting bracket arm (item 7) to the screw stud on the 90° arm-base mounting bracket (item 5). Adjust the angle accordingly.
4. Place the M4 external tooth washer (item 10) to the screw stud on the 90° arm-base mounting bracket (item 5).
5. Screw the star knob (item 8) onto the 90° arm-base mounting bracket (item 5) and then tighten the screw.
6. Insert the pivot bracket (item 6) into the incremental hold on the lighting bracket arm (item 7).

   **Note**: The lighting bracket arm length can be adjusted according to your needs. The linear increment on the arm is 5.5 mm.

7. Place the pivot rotation key (item 9) on the screw stud of the pivot bracket (item 6). Align the key with the groove on the arm.

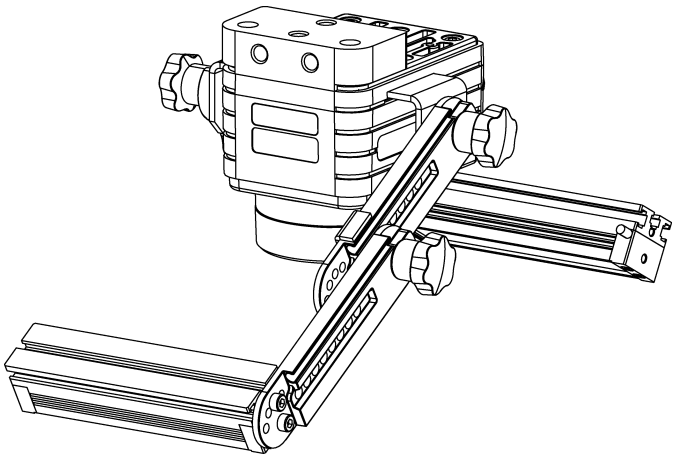
8. Place another lighting bracket arm (item 7) on the screw stud of the pivot bracket (item 6). Adjust the angle accordingly.
9. Place the M4 external tooth washer (item 10) on the screw stud of the pivot bracket (item 6).
10. Screw the star knob (item 8) onto the pivot bracket (item 6) and then tighten the screw.
11. Attach the external LED bar light to the lighting bracket arm (item 7) with screws provided with the LED bar light kit.

> **Note**: The screws for external LED bar lights are not included in the lighting bracket kit.

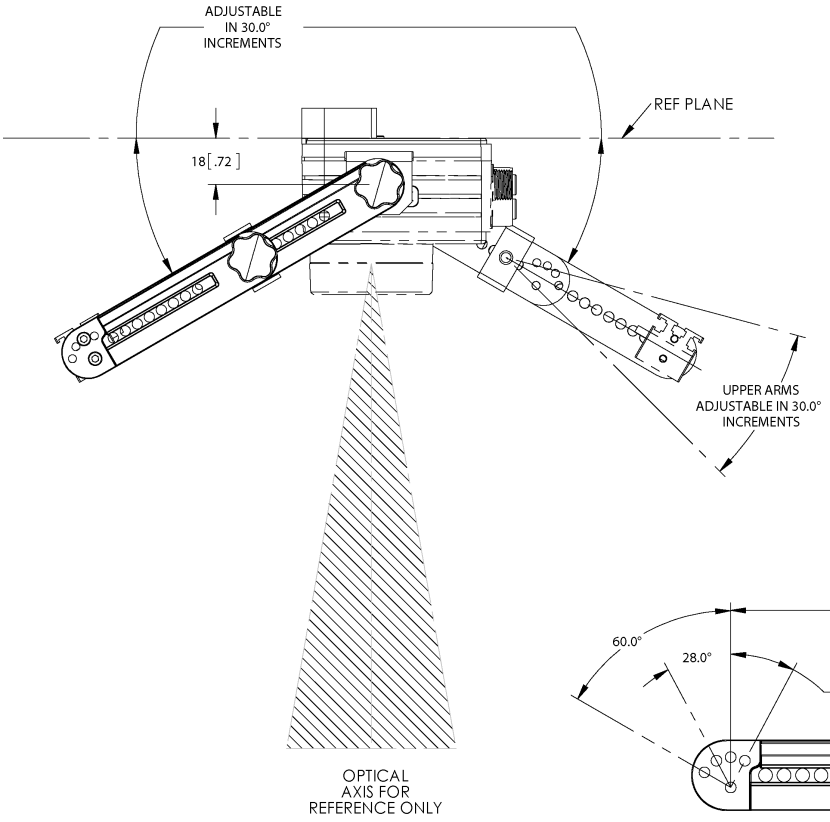
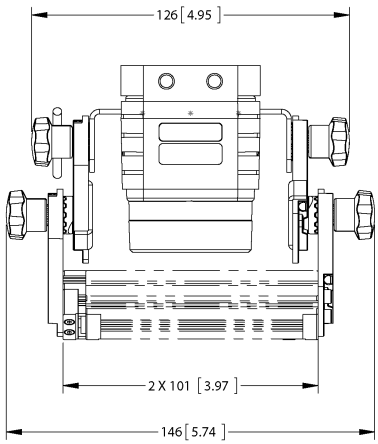
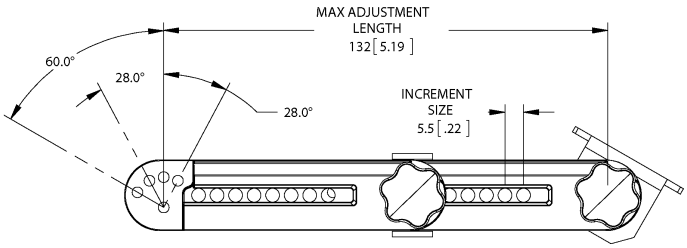
12. Repeat steps 3 to 11 to install the other side of the lighting bracket.

> **Tip**: The LED bar light cable can be routed in the groove on the lighting bracket arm (item 7).

Here is the vision system with the lighting bracket assembled:



# Lighting Bracket Dimensions

**Note**:

- Dimensions are in millimeters [inches] and are for reference purposes only.
- All specifications are for reference purposes only and can change without notice.