

# FS42 Fixed Industrial Scanner

## Product Reference Guide

MN-004914-03EN Rev A

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# About the Guide

This guide provides information on configurations, specifications and supported accessories of the FS42 Fixed Industrial Scanner to integrate the device into an industrial environment.

## Notational Conventions

The following notational conventions make the content of this document easy to navigate.

- **Bold** text is used to highlight the following:
  - Dialog box, window, and screen names
  - Dropdown list and list box names
  - Checkbox and radio button names
  - Icons on a screen
  - Key names on a keypad
  - Button names on a screen
- Bullets (•) indicate:
  - Action items
  - List of alternatives
  - Lists of required steps that are not necessarily sequential
- Sequential lists (for example, those that describe step-by-step procedures) appear as numbered lists.

## Service Information

If you have a problem with your equipment, contact Zebra Global Customer Support for your region. Contact information is available at: [zebra.com/support](https://zebra.com/support).

When contacting support, please have the following information available:

- Serial number of the unit
- Model number or product name
- Software/firmware type and version number

Zebra responds to calls by email, telephone, or fax within the time limits set forth in support agreements.

If your problem cannot be solved by Zebra Customer Support, you may need to return your equipment for servicing and will be given specific directions. Zebra is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty.

If you purchased your Zebra business product from a Zebra business partner, contact that business partner for support.

## Icon Conventions

The documentation set is designed to give the reader more visual clues. The following visual indicators are used throughout the documentation set.



**NOTE:** The text here indicates information that is supplemental for you to know and that is not required to complete a task.



**IMPORTANT:** The text here indicates information that is important for you to know.



**CAUTION:** If the precaution is not heeded, you could receive a minor or moderate injury.



**WARNING:** If danger is not avoided, you CAN be seriously injured or killed.



**DANGER:** If danger is not avoided, you WILL be seriously injured or killed.

# Getting Started

This section provides information for getting the scanner up and running for the first time including configurations, specifications and supported accessories.

## Configurations

The guide covers the following configurations.

**Table 1** FS42 Configurations

| SKU                              | Description                                                                                                                                                                                                  |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>FS42 2.3MP Standard Range</b> |                                                                                                                                                                                                              |
| FS42-SR20G4-2C00K                | FS42 Fixed Industrial Auto Focus Scanner: Standard Range, 2.3 MP, Fast 2D Barcode Decoder w/ DL OCR, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - India / Korea    |
| FS42-SR20G4-2C00W                | FS42 Fixed Industrial Auto Focus Scanner: Standard Range, 2.3 MP, Fast 2D Barcode Decoder w/ DL OCR, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Worldwide        |
| FS42-SR20G4-3C00K                | FS42 Fixed Industrial Auto Focus Scanner: Standard Range, 2.3 MP, Fast 2D Barcode Decoder w/ DL OCR, Ethernet with POE, Serial, USB, and Industrial Protocols, White Illumination, No Filter - India / Korea |
| FS42-SR20G4-3C00W                | FS42 Fixed Industrial Auto Focus Scanner: Standard Range, 2.3 MP, Fast 2D Barcode Decoder w/ DL OCR, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Worldwide      |
| FS42-SR20F4-2C00K                | FS42 Fixed Industrial Auto Focus Scanner: Standard Range, 2.3 MP, Fast 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - India / Korea              |
| FS42-SR20F4-2C00W                | FS42 Fixed Industrial Auto Focus Scanner: Standard Range, 2.3 MP, Fast 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Worldwide                  |
| FS42-SR20F4-3C00K                | FS42 Fixed Industrial Auto Focus Scanner: Standard Range, 2.3 MP, Fast 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - India / Korea            |
| FS42-SR20F4-3C00W                | FS42 Fixed Industrial Auto Focus Scanner: Standard Range, 2.3 MP, Fast 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Worldwide                |

**Table 1** FS42 Configurations (Continued)

| SKU                          | Description                                                                                                                                                                                             |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FS42-SR20Z4-2C00K            | FS42 Fixed Industrial Auto Focus Scanner: Standard Range, 2.3 MP, Standard 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - India / Korea     |
| FS42-SR20Z4-2C00W            | FS42 Fixed Industrial Auto Focus Scanner: Standard Range, 2.3 MP, Standard 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Worldwide         |
| FS42-SR20Z4-3C00K            | FS42 Fixed Industrial Auto Focus Scanner: Standard Range, 2.3 MP, Standard 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - India / Korea   |
| FS42-SR20Z4-3C00W            | FS42 Fixed Industrial Auto Focus Scanner: Standard Range, 2.3 MP, Standard 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Worldwide       |
| <b>FS42 2.3MP Wide Angle</b> |                                                                                                                                                                                                         |
| FS42-WA20G4-2C00K            | FS42 Fixed Industrial Auto Focus Scanner: Wide Angle, 2.3 MP, Fast 2D Barcode Decoder w/ DL OCR, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - India / Korea   |
| FS42-WA20G4-2C00W            | FS42 Fixed Industrial Auto Focus Scanner: Wide Angle, 2.3 MP, Fast 2D Barcode Decoder w/ DL OCR, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Worldwide       |
| FS42-WA20G4-3C00K            | FS42 Fixed Industrial Auto Focus Scanner: Wide Angle, 2.3 MP, Fast 2D Barcode Decoder w/ DL OCR, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - India / Korea |
| FS42-WA20G4-3C00W            | FS42 Fixed Industrial Auto Focus Scanner: Wide Angle, 2.3 MP, Fast 2D Barcode Decoder w/ DL OCR, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Worldwide     |
| FS42-WA20F4-2C00K            | FS42 Fixed Industrial Auto Focus Scanner: Wide Angle, 2.3 MP, Fast 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - India / Korea             |
| FS42-WA20F4-2C00W            | FS42 Fixed Industrial Auto Focus Scanner: Wide Angle, 2.3 MP, Fast 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Worldwide                 |
| FS42-WA20F4-3C00K            | FS42 Fixed Industrial Auto Focus Scanner: Wide Angle, 2.3 MP, Fast 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - India / Korea           |
| FS42-WA20F4-3C00W            | FS42 Fixed Industrial Auto Focus Scanner: Wide Angle, 2.3 MP, Fast 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Worldwide               |
| FS42-WA20Z4-2C00K            | FS42 Fixed Industrial Auto Focus Scanner: Wide Angle, 2.3 MP, Standard 2D Barcode Decoder, Ethernet with POE, Serial, USB, and Industrial Protocols, Red Illumination, No Filter - India / Korea        |
| FS42-WA20Z4-2C00W            | FS42 Fixed Industrial Auto Focus Scanner: Wide Angle, 2.3 MP, Standard 2D Barcode Decoder, Ethernet with POE, Serial, USB, and Industrial Protocols, Red Illumination, No Filter - Worldwide            |
| FS42--WA20Z4-3C00K           | FS42 Fixed Industrial Auto Focus Scanner: Wide Angle, 2.3 MP, Standard 2D Barcode Decoder, Ethernet with POE, Serial, USB, and Industrial Protocols, White Illumination, No Filter - India / Korea      |

Table 1 FS42 Configurations (Continued)

| SKU                            | Description                                                                                                                                                                                          |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FS42-WA20Z4-3C00W              | FS42 Fixed Industrial Auto Focus Scanner: Wide Angle, 2.3 MP, Standard 2D Barcode Decoder, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Worldwide        |
| <b>FS42 5MP Standard Range</b> |                                                                                                                                                                                                      |
| FS42-SR5IZ4-2C00K              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Standard 2D, Standard Range, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Korea           |
| FS42-SR5IZ4-2C00W              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Standard 2D, Standard Range, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Worldwide       |
| FS42-SR5IZ4-3C00K              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Standard 2D, Standard Range, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Korea         |
| FS42-SR5IZ4-3C00W              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Standard 2D, Standard Range, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Worldwide     |
| FS42-SR5IF4-2C00K              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, Standard Range, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Korea               |
| FS42-SR5IF4-2C00W              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, Standard Range, Ethernet with POE, Serial, USB, and Industrial Protocols, Red Illumination, No Filter - Worldwide          |
| FS42-SR5IF4-3C00K              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, Standard Range, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Korea             |
| FS42-SR5IF4-3C00W              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, Standard Range, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Worldwide         |
| FS42-SR5IG4-2C00K              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, DL OCR, Standard Range, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Korea       |
| FS42-SR5IG4-2C00W              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, DL OCR, Standard Range, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Worldwide   |
| FS42-SR5IG4-3C00K              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, DL OCR, Standard Range, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Korea     |
| FS42-SR5IG4-3C00W              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, DL OCR, Standard Range, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Worldwide |
| <b>FS42 5MP Wide Angle</b>     |                                                                                                                                                                                                      |
| FS42-WA5IZ4-2C00K              | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Standard 2D, Wide Angle, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Korea               |

**Table 1** FS42 Configurations (Continued)

| SKU               | Description                                                                                                                                                                                      |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FS42-WA51Z4-2C00W | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Standard 2D, Wide Angle, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Worldwide       |
| FS42-WA51Z4-3C00K | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Standard 2D, Wide Angle, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Korea         |
| FS42-WA51Z4-3C00W | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Standard 2D, Wide Angle, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Worldwide     |
| FS42-WA51F4-2C00K | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, Wide Angle, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Korea               |
| FS42-WA51F4-2C00W | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, Wide Angle, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Worldwide           |
| FS42-WA51F4-3C00K | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, Wide Angle, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Korea             |
| FS42-WA51F4-3C00W | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, Wide Angle, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Worldwide         |
| FS42-WA51G4-2C00K | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, DL OCR, Wide Angle, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Korea       |
| FS42-WA51G4-2C00W | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, DL OCR, Wide Angle, Ethernet with POE, Serial, USB and Industrial Protocols, Red Illumination, No Filter - Worldwide   |
| FS42-WA51G4-3C00K | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, DL OCR, Wide Angle, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Korea     |
| FS42-WA51G4-3C00W | FS42 Fixed Industrial Auto Focus Scanner: 5.0 MP Global Shutter, Fast 2D, DL OCR, Wide Angle, Ethernet with POE, Serial, USB and Industrial Protocols, White Illumination, No Filter - Worldwide |

## Zebra Integrated Multifunction Light Configurations

| ZIML Version                                                                                                   | SKU              | Description                                                                                                  |
|----------------------------------------------------------------------------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Zebra Integrated Multifunction Light (ZIML)</b>                                                             |                  |                                                                                                              |
| Zebra Integrated Multifunction Light (ZIML) Standard Model with 360° LED Indicator                             | LGHT-X020WH-0000 | LED Integrated Ring Light, White Wavelength, 20° Fan Angle, 360° Green/Red Feedback                          |
|                                                                                                                | LGHT-X040WH-0000 | LED Integrated Ring Light, White Wavelength, 40° Fan Angle. 360° Green/Red Feedback                          |
|                                                                                                                | LGHT-X060WH-0000 | LED Integrated Ring Light, White Wavelength, 60° Fan Angle. 360° Green/Red Feedback                          |
|                                                                                                                | LGHT-X080WH-0000 | LED Integrated Ring Light, White Wavelength, 80° Fan Angle. 360° Green/Red Feedback                          |
|                                                                                                                | LGHT-X020RD-0000 | LED Integrated Ring Light, Red Wavelength, 20° Fan Angle. 360° Green/Red Feedback                            |
|                                                                                                                | LGHT-X040RD-0000 | LED Integrated Ring Light, Red Wavelength, 40° Fan Angle. 360° Green/Red Feedback                            |
|                                                                                                                | LGHT-X060RD-0000 | LED Integrated Ring Light, Red Wavelength, 60° Fan Angle. 360° Green/Red Feedback                            |
|                                                                                                                | LGHT-X080RD-0000 | LED Integrated Ring Light, Red Wavelength, 80° Fan Angle. 360° Green/Red Feedback                            |
|                                                                                                                | LGHT-X020IR-0000 | LED Integrated Ring Light, IR Wavelength, 20° Fan Angle. 360° Green/Red Feedback                             |
|                                                                                                                | LGHT-X040IR-0000 | LED Integrated Ring Light, IR Wavelength, 40° Fan Angle. 360° Green/Red Feedback                             |
|                                                                                                                | LGHT-X060IR-0000 | LED Integrated Ring Light, IR Wavelength, 60° Fan Angle. 360° Green/Red Feedback                             |
|                                                                                                                | LGHT-X080IR-0000 | LED Integrated Ring Light, IR Wavelength, 80° Fan Angle. 360° Green/Red Feedback                             |
| Zebra Integrated Multifunction Light (ZIML) Premium Model with 360° LED Indicator, Precision Aimer, and Beeper | LGHT-X020WH-0100 | LED Integrated Ring Light, 20° Fan Angle, White Wavelength, 360° Green/Red Feedback, Precision Aimer, Beeper |

## Getting Started

| ZIML Version | SKU              | Description                                                                         |
|--------------|------------------|-------------------------------------------------------------------------------------|
|              | LGHT-X040WH-0100 | LED Integrated Ring Light, 40° Fan Angle, White Wavelength, Precision Aimer, Beeper |
|              | LGHT-X060WH-0100 | LED Integrated Ring Light, 60° Fan Angle, White Wavelength, Precision Aimer, Beeper |
|              | LGHT-X080WH-0100 | LED Integrated Ring Light, 80° Fan Angle, White Wavelength, Precision Aimer, Beeper |
|              | LGHT-X020RD-0100 | LED Integrated Ring Light, 20° Fan Angle, Red Wavelength, Precision Aimer, Beeper   |
|              | LGHT-X040RD-0100 | LED Integrated Ring Light, 40° Fan Angle, Red Wavelength, Precision Aimer, Beeper   |
|              | LGHT-X060RD-0100 | LED Integrated Ring Light, 60° Fan Angle, Red Wavelength, Precision Aimer, Beeper   |
|              | LGHT-X080RD-0100 | LED Integrated Ring Light, 80° Fan Angle, Red Wavelength, Precision Aimer, Beeper   |
|              | LGHT-X020IR-0100 | LED Integrated Ring Light, 20° Fan Angle, IR Wavelength, Precision Aimer, Beeper    |
|              | LGHT-X040IR-0100 | LED Integrated Ring Light, 40° Fan Angle, IR Wavelength, Precision Aimer, Beeper    |
|              | LGHT-X060IR-0100 | LED Integrated Ring Light, 60° Fan Angle, IR Wavelength, Precision Aimer, Beeper    |
|              | LGHT-X080IR-0100 | LED Integrated Ring Light, 80° Fan Angle, IR Wavelength, Precision Aimer, Beeper    |

## FS42 and ZIML Compatibility

The following table provides the recommended compatibility for pairing the FS42 and the Zebra Integrated Multifunction Light (ZIML).

**Table 2** FS42 / ZIML Configuration

| FS42 Configuration                                                                                                   | Field of View (Diagonal) | ZIML Configuration                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>FS42 5MP (Wide Angle)</b>                                                                                         |                          |                                                                                                                                                          |
| FS42-WA51Z4-2C00<br>FS42-WA51Z4-3C00<br>FS42-WA51F4-2C00<br>FS42-WA51F4-3C00<br>FS42-WA51G4-2C00<br>FS42-WA51G4-3C00 | 57°                      | 60°<br>LGHT-X060RD<br>LGHT-X060IR<br>LGHT-X060WH<br>80°<br>LGHT-X080RD<br>LGHT-X080IR<br>LGHT-X080WH                                                     |
| <b>FS42 2MP (Wide Angle)</b>                                                                                         |                          |                                                                                                                                                          |
| FS42-WA20G4-2C00<br>FS42-WA20G4-3C00<br>FS42-WA20F4-2C00<br>FS42-WA20F4-3C00                                         | 55°                      | 60°<br>LGHT-X060RD<br>LGHT-X060IR<br>LGHT-X060WH<br>80°<br>LGHT-X080RD<br>LGHT-X080IR<br>LGHT-X080WH                                                     |
| <b>FS42 5MP (Standard Range)</b>                                                                                     |                          |                                                                                                                                                          |
| FS42-SR51Z4-2C00<br>FS42-SR51Z4-3C00<br>FS42-SR51F4-2C00<br>FS42-SR51F4-3C00<br>FS42-SR51G4-2C00<br>FS42-SR51G4-3C00 | 38°                      | 40°<br>LGHT-X040RD<br>LGHT-X040IR<br>LGHT-X040WH<br>60°<br>LGHT-X060RD<br>LGHT-X060IR<br>LGHT-X060WH<br>80°<br>LGHT-X080RD<br>LGHT-X080IR<br>LGHT-X080WH |

**Table 2** FS42 / ZIML Configuration (Continued)

| FS42 Configuration               | Field of View (Diagonal) | ZIML Configuration |
|----------------------------------|--------------------------|--------------------|
| <b>FS42 2MP (Standard Range)</b> |                          |                    |
| FS42-SR20G4-2C00                 | 37°                      | 40°                |
| FS42-SR20G4-3C00                 |                          | LGHT-X040RD        |
| FS42-SR20F4-2C00                 |                          | LGHT-X040IR        |
| FS42-SR20F4-3C00                 |                          | LGHT-X040WH        |
| FS42-SR20Z4-2C00                 |                          | 60°                |
| FS42-SR20Z4-3C00                 |                          | LGHT-X060RD        |
|                                  |                          | LGHT-X060IR        |
|                                  |                          | LGHT-X060WH        |
|                                  |                          | 80°                |
|                                  |                          | LGHT-X080RD        |
|                                  |                          | LGHT-X080IR        |
|                                  |                          | LGHT-X080WH        |

## Specifications

The following table describes the device's physical attributes, performance and user environment specifications, and regulatory certifications.

**Table 3** Specifications

| Specification                   | Description                                                                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Physical Characteristics</b> |                                                                                                                                                                                        |
| Dimensions                      | 2.1 in. H x 2.5 in. W x 3.6 in. D<br>54.0 mm H x 64.0 mm W x 91.4 mm D                                                                                                                 |
| Weight                          | 14.1 oz./400.0 g                                                                                                                                                                       |
| Power                           | 10 to 30 VDC external power supply, 36W max at 24V<br>Class 4 PoE+ source, 25.5W max<br>Class 3 PoE source, 13W max<br>USB Type-C host, 7.5W max at 5V 1.5A or 15W max at 5V 3.0A      |
| Configurable IO                 | (4) Four optoisolated GPIO: GPIO0,1,2,3<br>(5) Five non-isolated GPIO: GPIO4,5,6*,7*,8*<br>*Unavailable when External Light Mode is enabled                                            |
| Interface Ports                 | (1) M12 X-Coded 1000/100/10 Mbps Ethernet<br>(1) M12 12-pin Power/GPIO<br>(1) M12 5-pin External Light Power & Control/GPIO<br>(1) USB 3.0 SuperSpeed Type-C with DisplayPort Alt Mode |

**Table 3** Specifications (Continued)

| Specification                      | Description                                                                                                                                                                                                                                                                        |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Communication Protocols            | Ethernet/IP, PROFINET, CC-Link, Modbus TCP, TCP/IP                                                                                                                                                                                                                                 |
| <b>Performance Characteristics</b> |                                                                                                                                                                                                                                                                                    |
| Image Sensor                       | Monochrome: 2.3 MP (1920 x 1200 pixels), 3.0µm pixel size CMOS Sensor<br>Monochrome 5.1 MP (2592 x 1944 pixels), 2.2µm pixel size CMOS Sensor                                                                                                                                      |
| Acquisition Rate                   | 2.3MP: 60 fps<br>5MP: 42 fps                                                                                                                                                                                                                                                       |
| Aimer                              | Red Class II Laser; 8-point sunburst pattern                                                                                                                                                                                                                                       |
| Illumination                       | Field replaceable modules:<br>(8) 660 nm Red LEDs<br>(8) 850 nm IR LEDs<br>(8) 2700K (Color Temperature) White LEDs<br>(4) 660 nm Red LEDs + (8) 850 nm IR LEDs + (8) 2700K (Color Temperature) White LEDs                                                                         |
| Imager Field of View               | 2MP SR (Standard Range): 10.3 mm Liquid Lens (29° H x 19° V Nominal)<br>2MP WA (Wide Angle): 6.7 mm Liquid Lens (41° H x 28° V Nominal)<br>5MP SR (Standard Range): 10.3 mm Liquid Lens (29° H x 22° V Nominal)<br>5MP WA (Wide Angle): 6.7 mm Liquid Lens (40° H x 32° V Nominal) |
| <b>User Environment</b>            |                                                                                                                                                                                                                                                                                    |
| Operating Temperature              | 32° F to 113° F/0° C to 45° C (10-30VDC external power supply, duty cycle-dependent)<br>32° F to 104° F/0° C to 40° C (POE, duty cycle dependent)                                                                                                                                  |
| Storage Temperature                | -40°F to 158°F / -40° to 70°C                                                                                                                                                                                                                                                      |
| Vibration Resistance               | EN 60068-2-6, 14 mm @ 2 to 10 Hz, 1.5 mm @ 13 to 55 Hz; 2 g @ 70 to 500 Hz; 2 hours on each axis                                                                                                                                                                                   |
| Shock Resistance                   | EN 60068-2-27, 30g; 11 ms; 3 shocks on each axis                                                                                                                                                                                                                                   |
| Environmental Sealing              | IP65 and IP67                                                                                                                                                                                                                                                                      |
| Humidity                           | 5% to 90% RH (Non-Condensing)                                                                                                                                                                                                                                                      |
| Light Immunity                     | The product operates in Incandescent 450 ft candles, Sunlight <6000 ft candles, Fluorescent 450 ft candles, LED 450 ft candles                                                                                                                                                     |
| Electrostatic Discharge            | ±15 kV Air, ±8 kV Contact, ±8 kV Indirect                                                                                                                                                                                                                                          |
| <b>Regulatory</b>                  |                                                                                                                                                                                                                                                                                    |
| Environmental                      | EN 50581:2012<br>EN IEC 63000:2018                                                                                                                                                                                                                                                 |
| Electrical Safety                  | IEC 62368-1 (Ed.2)<br>EN 62368-1:2014/A11:2017                                                                                                                                                                                                                                     |

**Table 3** Specifications (Continued)

| Specification                | Description                                                                                                                                                                                                                              |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Laser Safety (xS42 Only)     | 21CFR1040.10 & 21CFR1040.11<br>IEC/EN 60825-1:2014 (Ed.3)                                                                                                                                                                                |
| LED Safety                   | IEC 62471: 2006 (Ed.1)<br>EN 62471: 2008                                                                                                                                                                                                 |
| EMI/EMS                      | EN 55032:2015/A11: 2020<br>EN 55032:2015/A1: 2020<br>EN 55035:2017/A11: 2020<br>EN IEC 61000-3-2: 2019/A1:2021<br>EN 61000-3-3: 2013/A2:2021/AC:2022-01<br>EN 61000-6-2: 2005,2019<br>FCC 47 CFR Part 15, Subpart B<br>ICES-003, Issue 7 |
| EU Declaration of Conformity | 2014/30/EU; 2014/35/EU; 2011/65/EU.<br>Refer to the Declaration of Conformity (DoC) for details of compliance with the current standards.<br>The DoC is available at: <a href="https://zebra.com/doc">zebra.com/doc</a>                  |

## Accessories

This section provides details on compatible external lights, ring lights, and polarizers for the device.

### External Lighting

The following table lists all compatible external lighting accessories for the device.

**Table 4** External Lighting Accessories

| Part Number      | Description                                                                                                                    |                                                                                      |
|------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| LGHT-B100RD-0000 | LED Bar light, 100MM, red-625 wavelength, 5-Pin male M12 connector, semi-diffused, includes transparent and opaque diffusers.  |  |
| LGHT-B100BL-0000 | LED Bar light, 100MM, blue-465 wavelength, 5-Pin male M12 connector, semi-diffused, includes transparent and opaque diffusers. |                                                                                      |
| LGHT-B100WH-0000 | LED Bar light, 100MM, white wavelength, 5-Pin male M12 connector, semi-diffused, includes transparent and opaque diffusers.    |                                                                                      |
| LGHT-B100IR-0000 | LED Bar light, 100MM, IR-850 wavelength, 5-Pin male M12 connector, semi-diffused, includes transparent and opaque diffusers.   |                                                                                      |

**Table 4** External Lighting Accessories (Continued)

| Part Number      | Description                                                                                                                                                     |                                                                                       |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| LGHT-B300RD-0000 | LED Bar light, 300MM, red-625 wavelength, 5-Pin male M12 connector, semi-diffused, includes transparent and opaque diffusers.                                   |    |
| LGHT-B300BL-0000 | LED Bar light, 300MM, blue-465 wavelength, 5-Pin male M12 connector, semi-diffused, includes transparent and opaque diffusers.                                  |                                                                                       |
| LGHT-B300WH-0000 | LED Bar light, 300MM, white wavelength, 5-Pin male M12 connector, semi-diffused, includes transparent and opaque diffusers.                                     |                                                                                       |
| LGHT-B300IR-0000 | LED Bar light, 300MM, IR-850 wavelength, 5-Pin male M12 connector, semi-diffused, includes transparent and opaque diffusers.                                    |                                                                                       |
| Ring Lights      |                                                                                                                                                                 |                                                                                       |
| LGHT-R100BL-0000 | LED Ring light, 100MM, blue-465 wavelength, 5-Pin male M12 connector, semi-diffused, includes transparent and opaque diffusers.                                 |   |
| LGHT-R100WH-0000 | LED Ring light, 100MM, white wavelength, 5-Pin male M12 connector, semi-diffused, includes transparent and opaque diffusers.                                    |                                                                                       |
| LGHT-R100IR-0000 | LED Ring light, 100MM, IR-850 wavelength, 5-Pin male M12 connector, semi-diffused, includes transparent and opaque diffusers.                                   |                                                                                       |
| LGHT-R100RD-0000 | LED Ring light, 100MM, red-625 wavelength, 5-Pin male M12 connector, semi-diffused, includes transparent and opaque diffusers.                                  |                                                                                       |
| Polarizers       |                                                                                                                                                                 |                                                                                       |
| LGHT-A100BP-0000 | 100MM Bar Light Polarizer, for use with 100mm External Light Bars (LGHT-B100xx-0000). Not for use with IR-850 wavelengths or when IR image capture is required. |  |

**Table 4** External Lighting Accessories (Continued)

| Part Number      | Description                                                                                                                                                     |                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| LGHT-A300BP-0000 | 300MM Bar Light Polarizer, for use with 300mm External Light Bars (LGHT-B300xx-0000). Not for use with IR-850 wavelengths or when IR image capture is required. |  |
| LGHT-A100RP-0000 | Light Polarizer, for use with 100mm External Ring Lights (LGHT-R100xx-0000). Not for use when IR image capture is required.                                     |  |

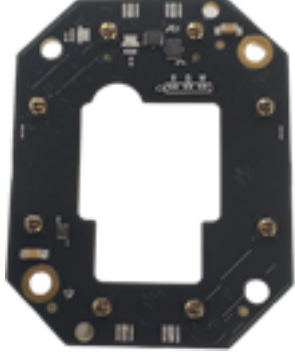
## Internal Ring Lighting

The following table provides information on compatible internal lighting accessories and replacement ring light covers.

**Table 5** Internal Lighting Accessories

| Part Number      | Description                                                                                |                                                                                       |
|------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ZLED-XS40WH-0000 | Internal Ring Light, White LED<br>Not for use when IR image capture is required.           |  |
| ZLED-XS40RD-0000 | Internal Ring Light, Red LED<br>Red lighting is typically used to capture images on paper. |  |

**Table 5** Internal Lighting Accessories (Continued)

| Part Number                          | Description                                                                                                                                                                                         |                                                                                       |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ZLED-XS40IR-0000                     | Internal Ring Light, IR<br>LED IR lighting is typically used in environments where users do not want to see external lighting when detecting clear liquids or inspecting produce.                   |    |
| ZLED-XS40MC-0000                     | Internal Ring Light<br>Multi-Color - White, Red, IR, Blue, and Green LEDs.<br>White LEDs are controllable in individual banks of 4 LEDs. IR and Red are controllable in individual banks of 2 LEDs. |    |
| <b>Replacement Ring Light Covers</b> |                                                                                                                                                                                                     |                                                                                       |
| ZLED-XS40PW-0000                     | Integrated Light Cover (Replacement) Cross Polarizer.<br>For use with Wide Angle (WA) configurations only.<br>Not for use when IR image capture is required.                                        |  |
| ZLED-XS40PS-0000                     | Integrated Light Cover (Replacement) Cross Polarizer.<br>For use with Standard Range (SR) configurations only.<br>Not for use when IR image capture is required.                                    |  |

**Table 5** Internal Lighting Accessories (Continued)

| Part Number      | Description                                                                                   |                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| ZLED-XS40CW-0000 | Integrated Light Cover (Replacement)<br>For use with Wide Angle (WA) configurations only.     |  |
| ZLED-XS40CS-0000 | Integrated Light Cover (Replacement)<br>For use with Standard Range (SR) configurations only. |  |

## Internal Filters

The device supports red, blue, IR bandpass, and IR blocker filters.

**Table 6** Internal Filters

| Part Number      | Description                |                                                                                       |
|------------------|----------------------------|---------------------------------------------------------------------------------------|
| ZFLT-XS40RD-0000 | Red Bandpass Zebra Filter  |  |
| ZFLT-XS40BL-0000 | Blue Bandpass Zebra Filter |  |
| ZFLT-XS40IR-0000 | IR Bandpass Zebra Filter   |  |

**Table 6** Internal Filters (Continued)

| Part Number      | Description                                                                                                 |
|------------------|-------------------------------------------------------------------------------------------------------------|
| ZFLT-XS40MC-0000 | IR Blocker Zebra Filter  |

### Spectral Transmission Data

The following table provides spectral transmission data while using supported internal filters for the device.



**NOTE:** The spectral transmission table applies to the following filters on the device:

- ZFLT-XS40RD-0000 Red Bandpass Zebra Filter
- ZFLT-XS40BL-0000 Blue Bandpass Zebra Filter
- ZFLT-XS40IR-0000 IR Bandpass Zebra Filter
- ZFLT-XS40MC-0000 IR Blocker Zebra Filter

| Spectral Transmission        | Blue        | Red         | IR          | RGB (IR Block) | Clear       |
|------------------------------|-------------|-------------|-------------|----------------|-------------|
| <b>Normal Incident Angle</b> |             |             |             |                |             |
| 3% Maximum                   |             | 400-565 nm  | 400-720 nm  |                |             |
| 10% Maximum                  | 400 nm      | 600 nm      | 755 nm      |                |             |
| 90% Minimum                  | 425-525 nm  | 625-700 nm  | 780-925 nm  | 400-700 nm     | 400-925 nm  |
| Maximum (Reference)          | 465-495 nm  | 650-680 nm  | 855-895 nm  |                |             |
| 10% Maximum                  | 550 nm      | 725 nm      | 950 nm      | 725 nm         | 950 nm      |
| 3% Maximum                   | 585-1050 nm | 760-1050 nm | 985-1050 nm | 760-1050 nm    | 985-1050 nm |
| <b>30° Incident Angle</b>    |             |             |             |                |             |
| 88% Minimum                  | 465-495 nm  | 650-670 nm  | 855-890 nm  | 400-665 nm     | 465-890 nm  |



**NOTE:** Filter coating is applied to one side only.

## Cables

The device is compatible with various USB, Ethernet, external light control, and power cables for use with the FS42 and the Zebra Integrated Multifunction Light (ZIML).

**Table 7** Cables

| Part Number                          | Description                                                                                                                                                                                                                             |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>USB Cables</b>                    |                                                                                                                                                                                                                                         |
| CBL-USB00200-USC00                   | USB 2M, IP67 locking USB-C to USB-C (SuperSpeed), Compatible with all FS/VS devices.                                                                                                                                                    |
| CBL-USB00400-USC00                   | USB 4M, IP67 locking USB-C to USB-C, Compatible with all FS/VS devices.                                                                                                                                                                 |
| CBL-USB00200-USA00                   | USB 2M, IP67 locking USB-C to USB-A (SuperSpeed), Compatible with all FS/VS devices.                                                                                                                                                    |
| CBL-USB00400-USA00                   | USB 4M, IP67 locking USB-C to USB-A, Compatible with all FS/VS devices.                                                                                                                                                                 |
| <b>Ethernet Cables</b>               |                                                                                                                                                                                                                                         |
| CBL-ENT00500-M1200                   | 5M length, X-Coded M12 to RJ45 connectors, Compatible with all FS/VS devices that include an Ethernet port.                                                                                                                             |
| CBL-ENT01500-M1200                   | 15M length, X-Coded M12 to RJ45 connectors, Compatible with all FS/VS devices that include an Ethernet port.                                                                                                                            |
| <b>External Light Control Cables</b> |                                                                                                                                                                                                                                         |
| CBL-LGT00000-M1200                   | 5-pin M12 to 5-pin M12 External Light Control, 0.3M length. Only compatible with devices that include an external light port.                                                                                                           |
| CBL-LGT00200-M1200                   | 5-pin M12 to 5-pin M12 External Light Control, 2M length. Only compatible with devices that include an external light port.                                                                                                             |
| <b>Power Cables</b>                  |                                                                                                                                                                                                                                         |
| CBL-PWR00500-M1220                   | Power and I/O Y Cable, 5M, 12 Pin and 8 Pin M12 to Flying Leads, Standard Flex<br><br> <b>NOTE:</b> For use when integrating the FS42 with the ZIML. |
| CBL-PWR00500-M1200                   | 12-pin M12 to flying lead breakout cable, 5M length.                                                                                                                                                                                    |
| CBL-PWR01500-M1200                   | 12-pin M12 to flying lead breakout cable, 15M length.                                                                                                                                                                                   |

## Brackets

All Zebra FS/VS devices support mounting with a standard L-Mount bracket.

**Table 8** Brackets

| Part Number    | Description     |                                                                                     |
|----------------|-----------------|-------------------------------------------------------------------------------------|
| BRKT-LMNT-U000 | L-Mount Bracket |  |

### See Also

[Mounting the Device Using the L-Bracket](#)

## Power Supplies

The device is compatible with 24VDC power supplies and PoE injectors.

**Table 9** Power Supplies

| Part Number     | Description                 |                                                                                       |
|-----------------|-----------------------------|---------------------------------------------------------------------------------------|
| PWR-24V03A-0000 | Power Supply, 24VDC<br>3AMP |  |
| PWR-24V05A-0000 | Power Supply, 24VDC<br>5AMP |  |

**Table 9** Power Supplies (Continued)

| Part Number     | Description                                      |                                                                                     |
|-----------------|--------------------------------------------------|-------------------------------------------------------------------------------------|
| PWR-POE30W-0000 | Power over Ethernet Injector, 30W POE+, AC Input |  |
| PWR-POE60W-0000 | Power over Ethernet Injector, 60W POE+, AC Input |                                                                                     |

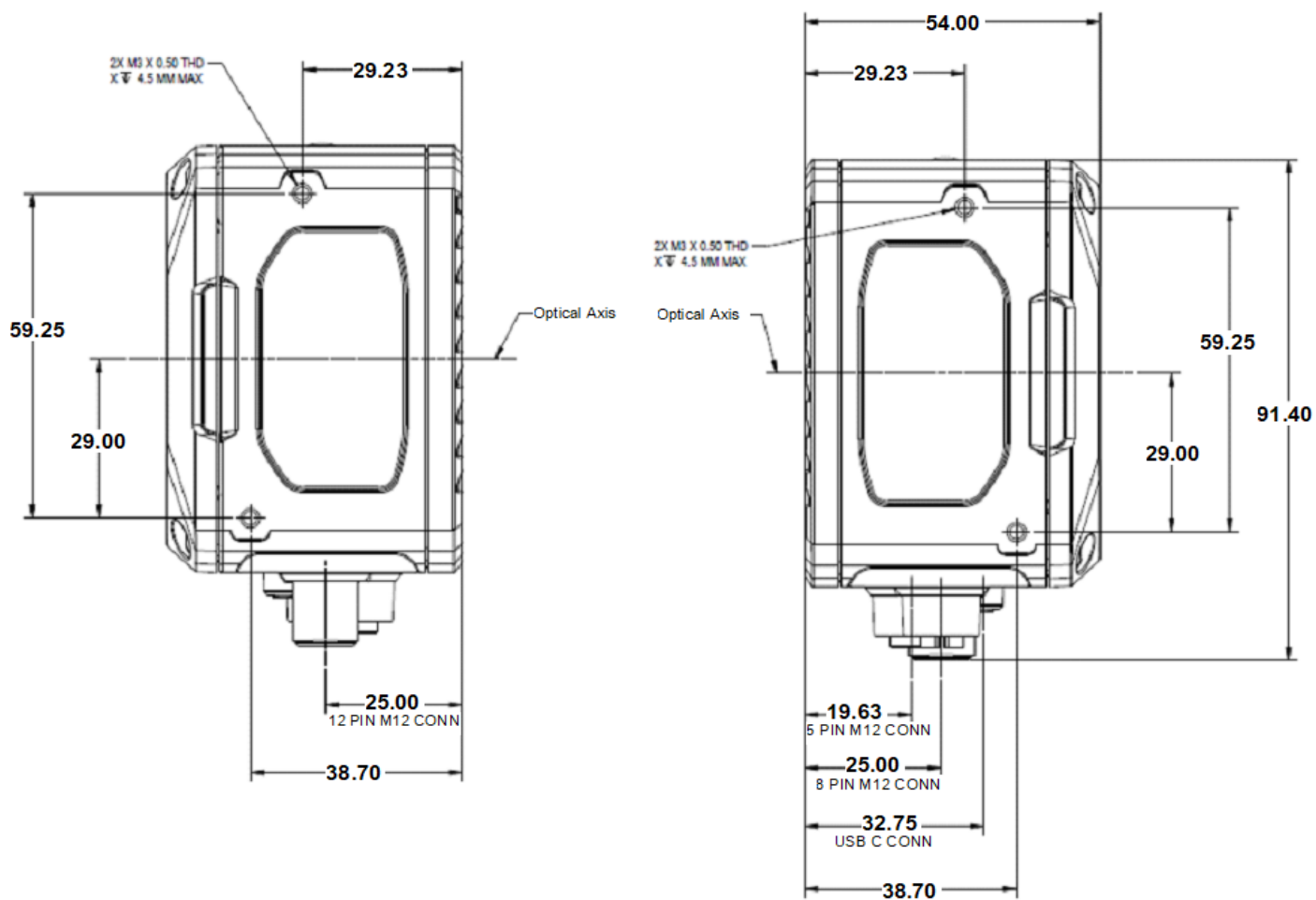
# Installation

View the dimensional drawings to understand how to mount the device.

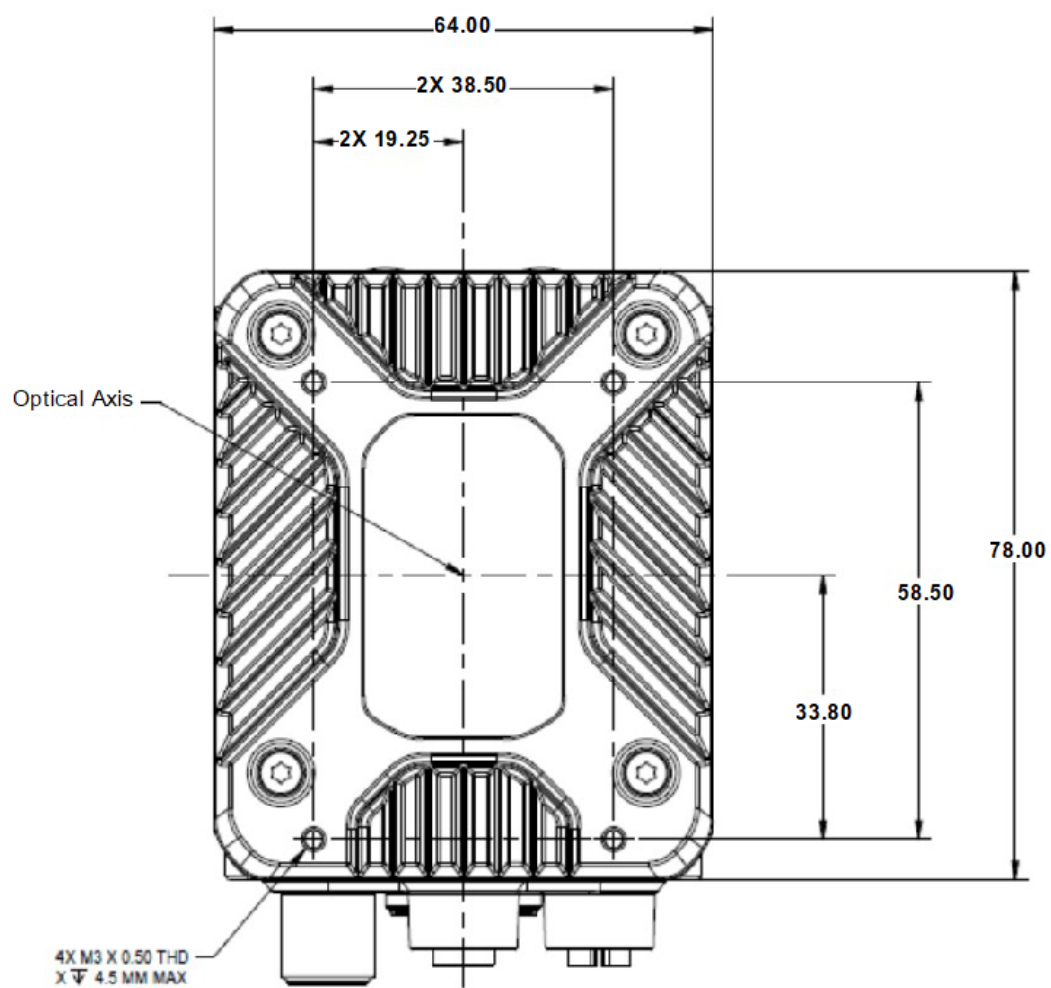
## Dimensional Drawings

The diagrams in this section outline the dimensions and mounting hole positions of the device.

**Figure 1** Side Dimensional Drawings

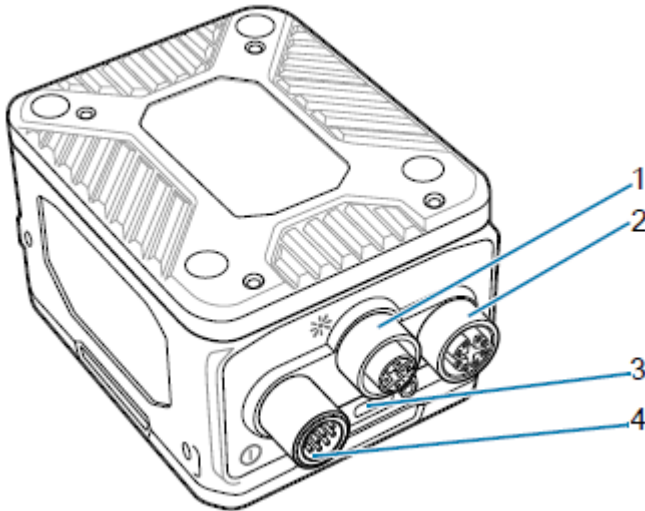


**Figure 2** Back Mounting Holes



## Connections

The device supports connections for USB-C with DisplayPort, power serial and GPIO, x-coded Ethernet, and external lighting.



|   |                          |
|---|--------------------------|
| 1 | External Lighting        |
| 2 | X-Coded Ethernet Port    |
| 3 | USB-C (with DisplayPort) |
| 4 | Power Serial and GPIO    |

## Torque Specification

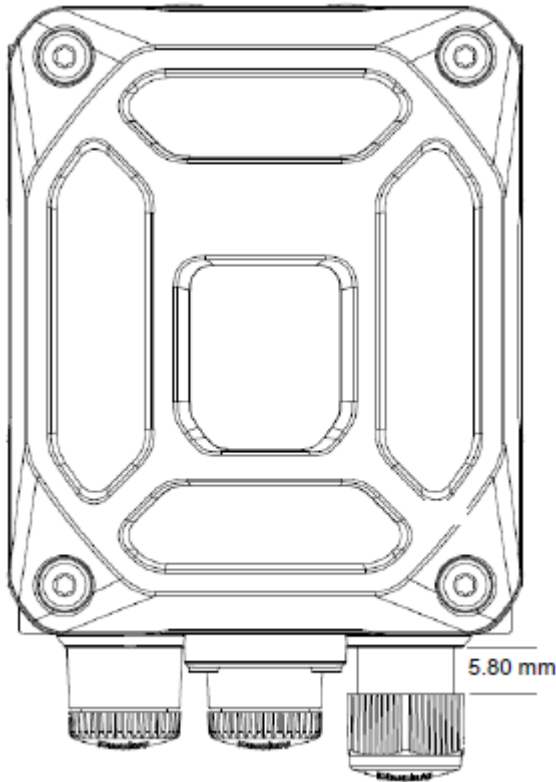
To ensure an IP65 and IP67 product specification, Zebra cables and/or connector covers must be torqued to the following specification:

- Torque for M12 Zebra cables: 24.0 in-lbs
- Torque for connector covers: 10.0 in-lbs



**NOTE:** Connector covers are hand tightened from the factory to allow for easy hand removal. The covers must be torqued at installation to guarantee an IP65 and IP67 specification if cables are not used.

Refer to the following diagram for the reference dimension (in mm) of the 12-pin M12 cable:



## Power Sources

Power the device through a 12-pin M12 connector, Power over Ethernet (PoE), or USB Type C to satisfy various use cases.

A power priority scheme selects power from the M12 connector over PoE and PoE over USB-C to ensure the device consumes the least restrictive power source. Changes to the power source trigger a reboot. This acts as a power budget for the device, dynamically allocating power to prevent an overload condition. Allocation is based on sensor type and enabled features such as Ethernet PHYs, digital outputs, and advertised USB Type C port current. Models with internal illumination reduce illumination intensity or duration to operate within budget and may disable internal illumination entirely if necessary.



**NOTE:** Develop jobs with power sources and auxiliary equipment that are representative of the final intended configuration to prevent a mismatch during deployment.

### 12 Pin M12 Power Input

If the input voltage exceeds 21.5 V, the vision system enables up to 1.5 A output to the USB Type C connector. If the external light connector is placed in external light mode, power is shunted from the power supply directly to the light through a bypass circuit that supports the high peak currents of strobe lights. A self-resettable fuse prevents physical overload of the 12-pin M12 connector.

If less than 21.5 V is provided to the device, the advertised USB Type C current is lowered to 500 mA, and the overall power budget is reduced. This may impact allowable internal illumination configurations. As a result, a 24 V industrial power supply capable of high pulse currents of long duration is recommended for optimal performance.

### Power Over Ethernet

The devices support operation from power sourcing equipment that meets the IEEE 802.3at class 4 (25.5 W) or 802.3af class 3 (13 W) Power Over Ethernet (PoE) standards. These are commonly referred to as PoE+ and PoE by equipment providers, respectively.

Power over Ethernet requires an extra regulation step, which incurs additional thermal buildup within the device. As a result, the specified operating temperature range narrows when powered via PoE.

### USB Type C

USB Type C allows for novel and cost-effective installations provided the following constraints are acceptable:

- Digital GPIO are unavailable.
- Optocoupled GPIO is still functional, provided the COMMON\_IN and COMMON\_OUT are properly terminated.
- The External Light Connector is disabled and cannot be used in GPIO or External Light modes.
- 0 V to 10 V analog output is disabled.
- Illumination is limited or requires a USB power source with further capabilities to be enabled at any capacity.



**NOTE:** The device boots from legacy USB host ports. However, the current draw is not guaranteed to be under 500 mA, and device functionality may be restricted to the extent that performance can be impaired. An override mode can be enabled for legacy host ports that are known by the operator to be capable of supplying up to 1.5 A. Ports of this type are often described as having USB BC1.2 or USB charging support.

### Grounding for Electro-Magnetic Compliance and ESD Safe

The vision system is designed with a rugged metal chassis connected internally to ground for robust Electro-Magnetic Compliance (EMC) and ESD Safe operation. Do not mount to any conductive object, body, structure, or mechanism that may become connected to line voltage or a voltage potential other than Protected Earth Ground. Chassis grounding via cable shield, mounting screws, or low inductance ground strap to a local Protected Earth Ground is acceptable.

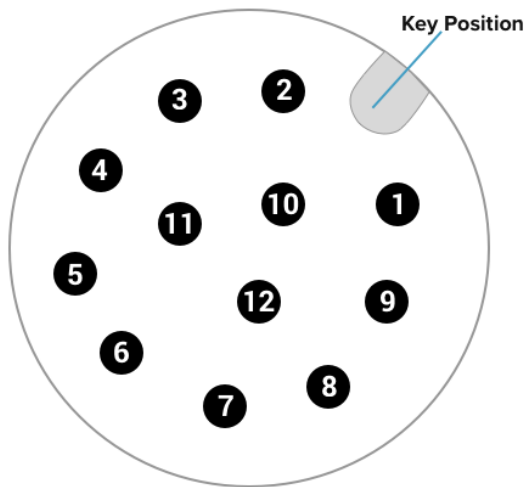


**NOTE:** There is no galvanic connection to Earth Ground when the device is powered over an unshielded Ethernet cable. In this scenario, grounding to local Earth Ground through another cable shield, mounting screw, or ground strap is required for ESD Safe compliance and best practice for EMC.

### Cable Pin Outs

This section provides pin and cable color information for the power and I/O, Ethernet, and external lighting connectors.

## Power and IO Connector

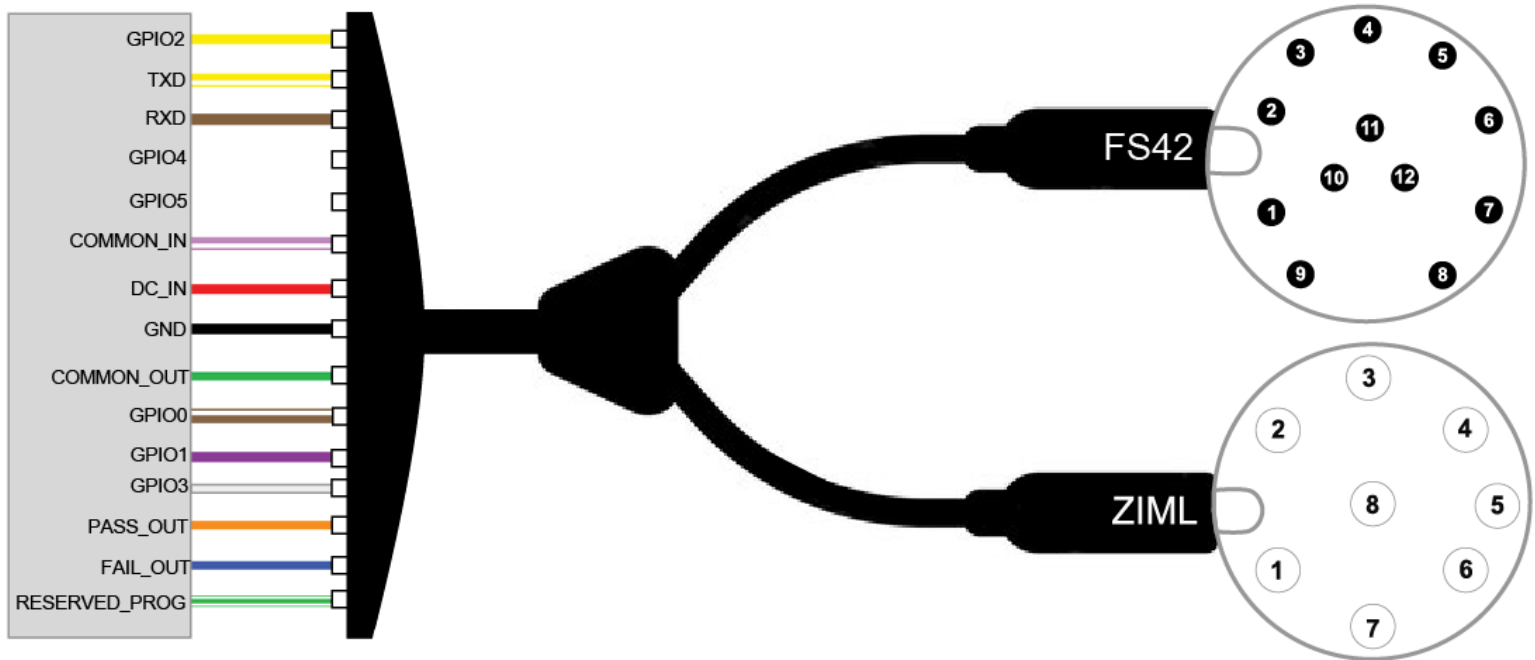


**Table 10** Power and I/O Connector Pinout Diagram

| Pin   | Color        | Description |
|-------|--------------|-------------|
| 1     | Yellow       | GPIO2       |
| 2     | White/Yellow | TXD         |
| 3     | Brown        | RXD         |
| 4     | White/Brown  | GPIO4       |
| 5     | Violet       | GPIO5       |
| 6     | White/Violet | COMMON_IN   |
| 7     | Red          | DC_IN       |
| 8     | Black        | GND         |
| 9     | Green        | COMMON_OUT  |
| 10    | Orange       | GPIO0       |
| 11    | Blue         | GPIO1       |
| 12    | Grey         | GPIO3       |
| SHELL | Bare         | SHIELD      |

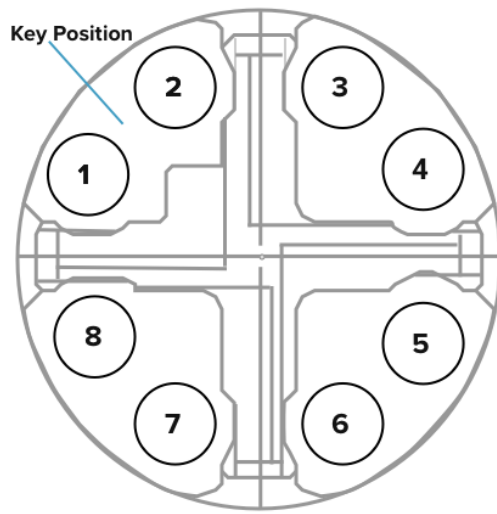
## Power and IO Y Cable

The power and IO Y cable (CBL-PWR00500-M1220) transmits and receives digital IO signals and provides power to the FS42 (12-pin Male) and the Zebra Integrated Multifunction Light (8-Pin Female).



| Flying Leads Color (24 AWG) | Function      | 12-Pin A-Coded Male M12 to FS42 |              | 8-Pin A-Coded Female M12 to ZIML |              |
|-----------------------------|---------------|---------------------------------|--------------|----------------------------------|--------------|
| Yellow                      | GPIO2         | 1                               | Yellow       | -                                | -            |
| White/Yellow                | TXD           | 2                               | White/Yellow | -                                | -            |
| Brown                       | RXD           | 3                               | Brown        | -                                | -            |
| -                           | GPIO4         | 4                               | Orange       | 4                                | Orange       |
| -                           | GPIO5         | 5                               | Blue         | 5                                | Blue         |
| White/Violet                | COMMON_IN     | 6                               | White/Violet | -                                | -            |
| Red                         | DC_IN         | 7                               | Red          | 1                                | Red          |
| Black                       | GND           | 8                               | Black        | 8                                | Black        |
| Green                       | COMMON_OUT    | 9                               | Green        | 6                                | Green        |
| White/Brown                 | GPIO0         | 10                              | White/Brown  | -                                | -            |
| Violet                      | GPIO1         | 11                              | Violet       | -                                | -            |
| Grey                        | GPIO3         | 12                              | Grey         | -                                | -            |
| Orange                      | PASS_OUT      | -                               | -            | 7                                | White/Orange |
| Blue                        | FAIL_OUT      | -                               | -            | 2                                | White/Blue   |
| White/Green                 | RESERVED_PROG | -                               | -            | 3                                | White/Green  |

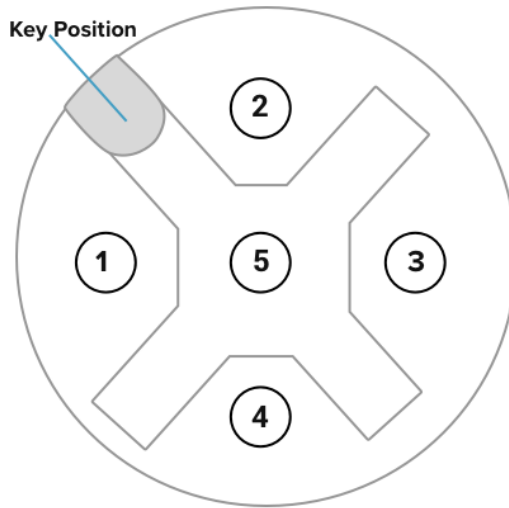
## Ethernet Connector



**Table 11** Ethernet Connector Pinout Diagram

| Pin   | Description |
|-------|-------------|
| 1     | TP1+        |
| 2     | TP1-        |
| 3     | TP2+        |
| 4     | TP2-        |
| 5     | TP4+        |
| 6     | TP4-        |
| 7     | TP3-        |
| 8     | TP3+        |
| SHELL | SHIELD      |

## External Light Connector



**Table 12** External Light Connector Pinout Diagram

| Pin   | Color | Description    |
|-------|-------|----------------|
| 1     | Brown | DC_OUT / GPIO8 |
| 2     | White | GPIO7          |
| 3     | Blue  | GND            |
| 4     | Black | GPIO6          |
| 5     | Grey  | ANALOG_OUT     |
| SHELL | Bare  | SHIELD         |

## Mounting Instructions

The following sections describe the steps to mount the device to the L-bracket accessory.

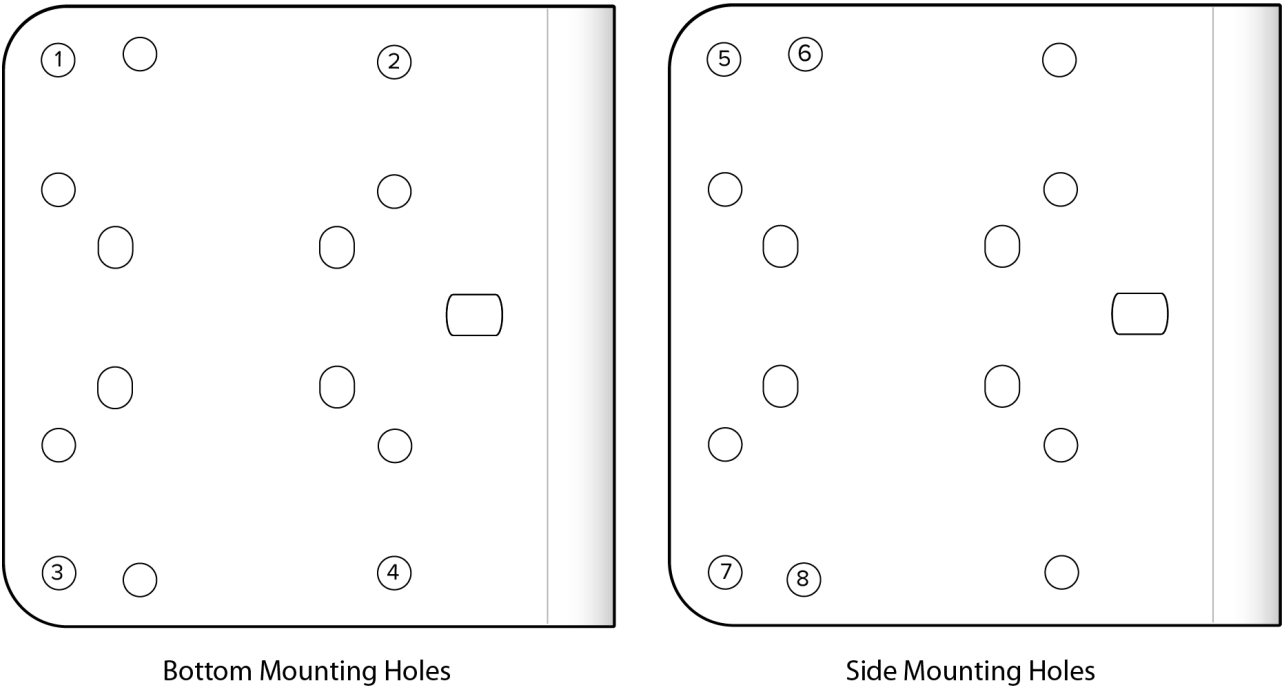
1. Align the holes on the mounting surface with the mounting holes on the device.
2. Insert screws into the mounting holes and tighten. It is recommended to use four M3 screws to attach the camera on the bottom surface. Torque screws to 6.9 kgf-cm (6.0 lbf-in).

Review the dimensional drawings for mounting hole placements on the devices to determine the proper screw lengths needed based on the provided tapping depths into the camera.

### Mounting the Device Using the L-Bracket

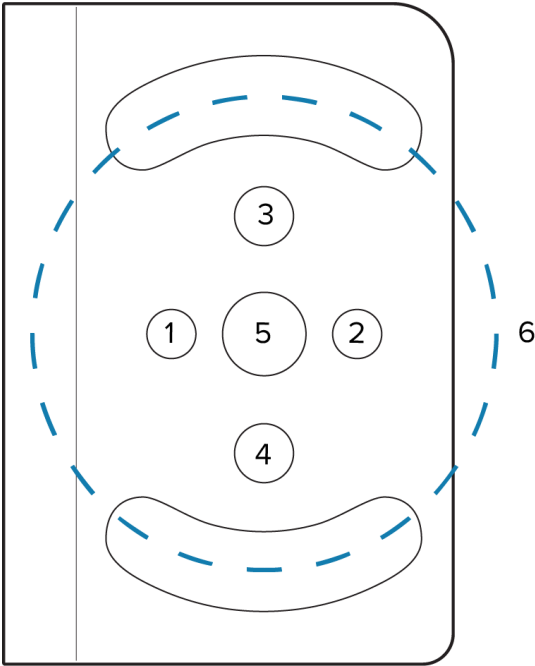
1. Use the mounting screws provided with the kit to attach the camera to the bracket. Torque screws to 6.9 kgf-cm (6.0 lbf-in).
2. Refer to the L-bracket mounting options outlined below.

**Figure 3** Bottom and Side Mounting Options



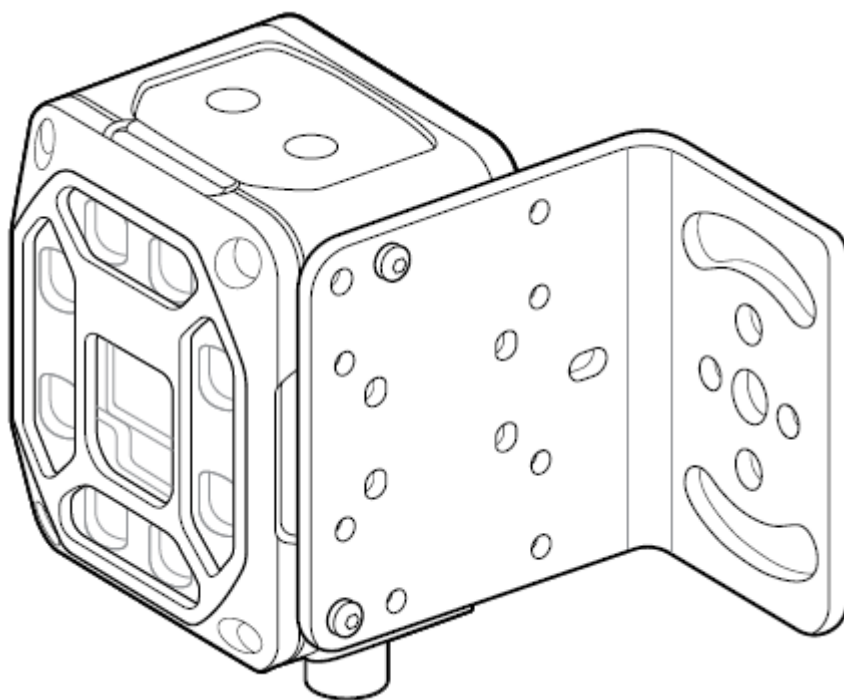
|     |                                                     |
|-----|-----------------------------------------------------|
| 1-4 | Bottom Surface Mounting Holes for both devices      |
| 5-8 | Side Mounting Holes for xS40, xS42 and xS70 devices |

**Figure 4** Side Mounting Orientation



|     |                    |
|-----|--------------------|
| 1-2 | M5 Clearance       |
| 3-4 | 1/4-20 Clearance   |
| 5   | M8 Clearance       |
| 6   | M8 Clearance Slots |

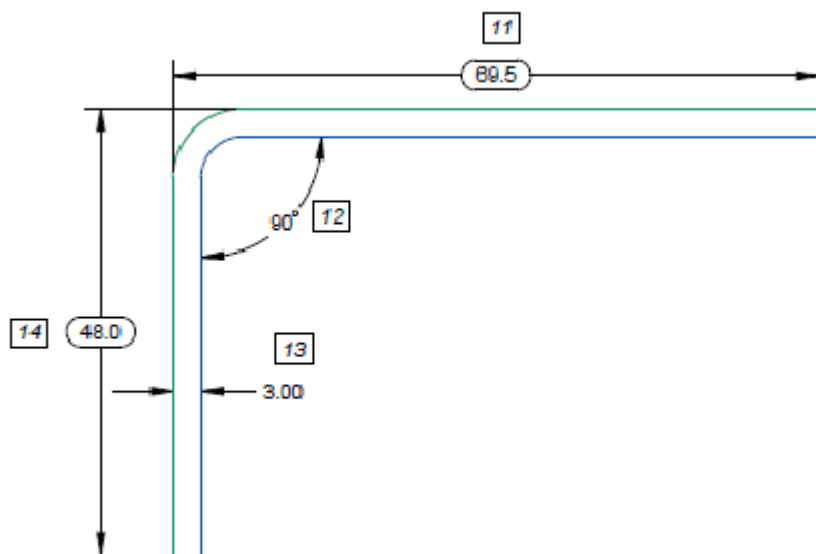
**Figure 5** Side Mounting Orientation



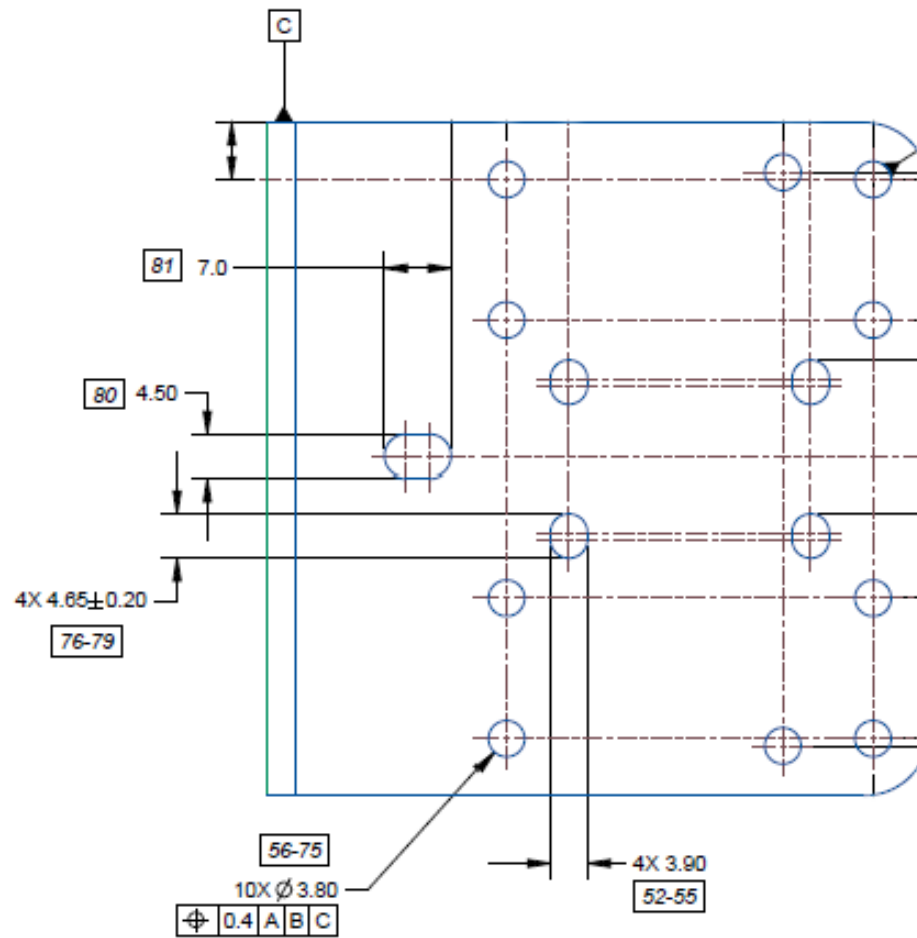
## Mounting Bracket Dimensions

The following diagrams provide dimensions for the mounting bracket.

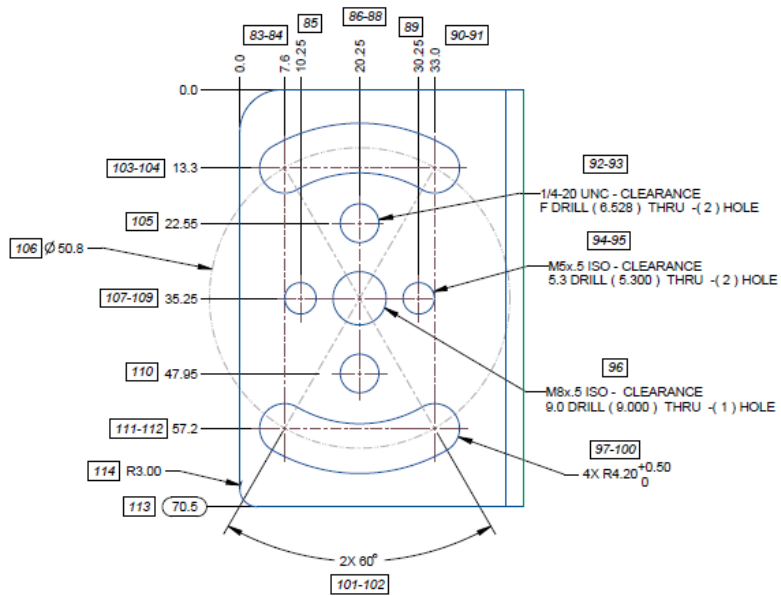
**Figure 6** L Bracket Dimensions



**Figure 7** L Bracket Bottom Dimensions



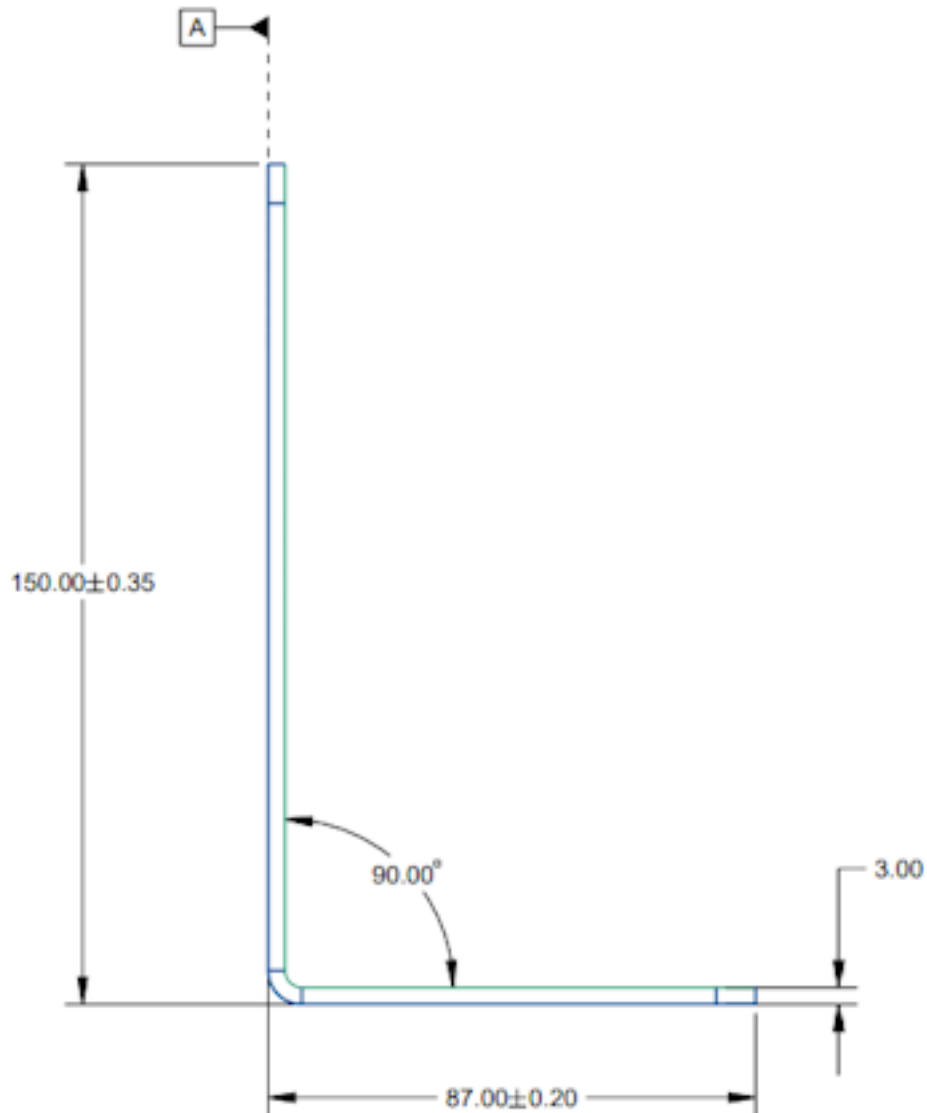
**Figure 8** L Bracket Side Dimensions



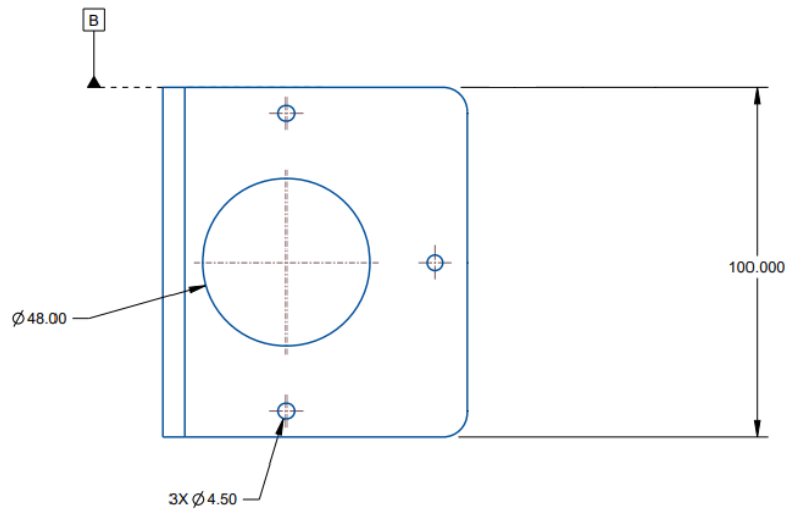
## Light Bracket Dimensions

The diagrams in this section describe the dimensions of the light bracket.

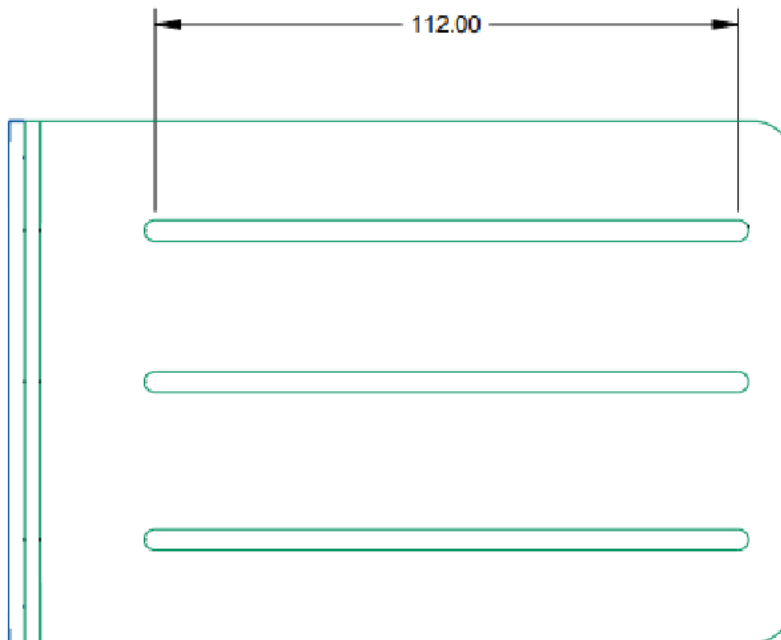
**Figure 9** Light Bracket Dimensions



**Figure 10** Light Bracket Dimensions



**Figure 11** Light Bracket Dimensions



## Installing the ZIML onto an FS42

Install the ZIML using the FS42-specific adapter bracket on the camera, then install the camera and adapter on the light using the screws supplied with the light.

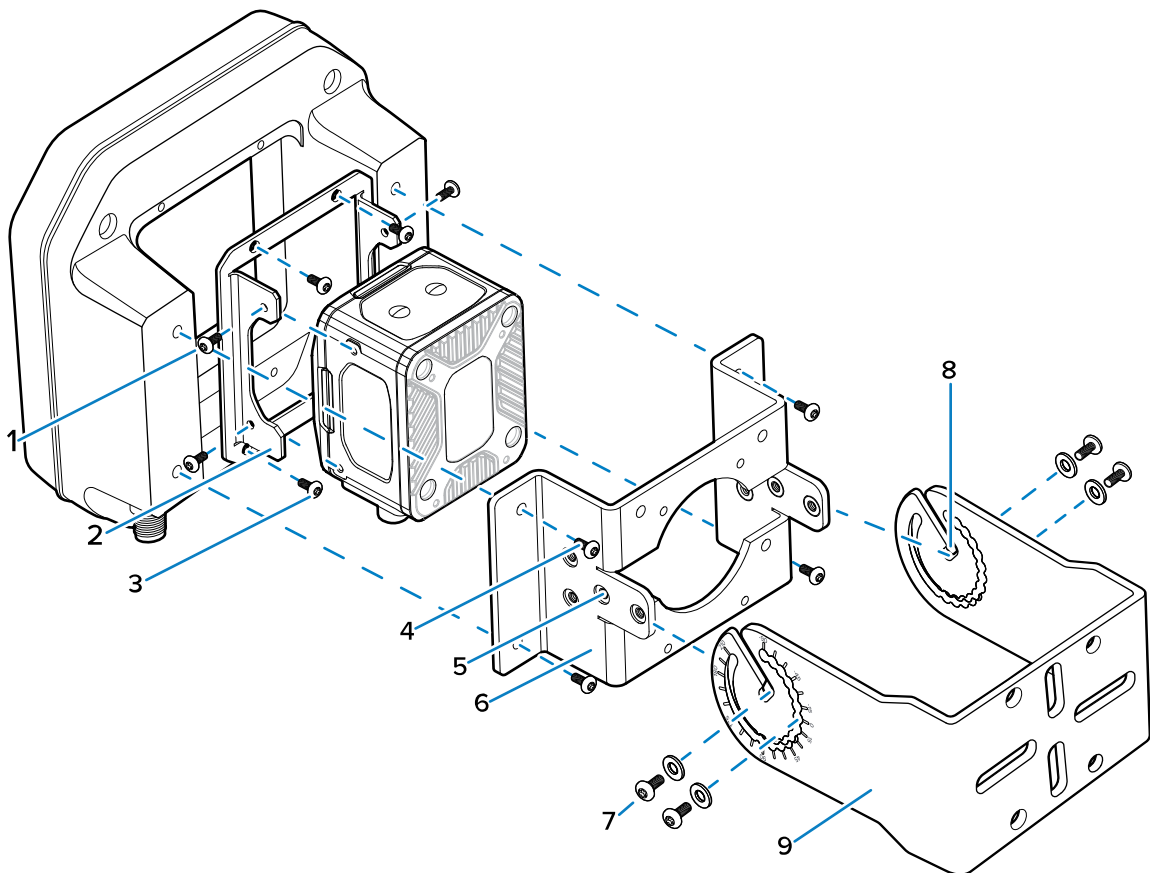


**NOTE:** Installation may require two people to hold the light while attaching it to the mounting bracket. Consider wearing gloves during the installation process to keep the lens clean.

Required equipment:

- (4) M3X6mm screws
  - Torx T10 Screwdriver
  - Recommended Torque: 0.6 N-m / 5.3 lbf-in
- (4) M4X6mm screws
  - Torx T20 Screwdriver
  - Recommended Torque: 0.9 N-m / 8 lbf-in

**Figure 12** ZIML / FS42 Installation



1. Attach the adapter bracket onto the FS42 using (4) M3x6mm adapter screws  $S_A$ . Consider using the box that the light came in to protect the equipment and keep the lens clean during installation. Recommended Torque: 0.6 N-m / 5.3 lbf-in.

2. Attach the FS42 and the adapter onto the light using (4) M4x6mm screws. Recommended Torque: 0.9 N-m / 8 lbf-in. Ensure that all connectors are oriented in the same direction.
3. Attach the flanged U-shaped piece (F) of the tilt bracket to the light using (4) M4x6mm screws ( $S_F$ ). Recommended Torque: 0.9 N-m / 8 lbf-in.
4. Set the (2) M4x8mm pivot screws ( $S_P$ ) into the flanged piece.
5. Mount the adjustable U bracket to the frame rail using appropriate hardware based on your industrial environment ( $S_R$ ) (not provided).
6. Hang the camera and light assembly onto the U bracket by sliding the pivot screws into the pivot slots ( $U_{SLOT}$ ).
7. Adjust the assembly to the desired angle and secure with (2) locking M4x8mm screws ( $S_L$ ) and the pivot screw ( $S_P$ ).
8. Connect the Y cable to the M12 connectors on the camera and the light.



**WARNING:** When using the FS42 with the Zebra Integrated Multifunction Light, use CBL-PWR00500-M1220 (green connector) and ensure you are connecting to the connector marked Power. ①.

**Table 13** Symbol Definitions

| Callout | Symbol     | Definition                                        |
|---------|------------|---------------------------------------------------|
| 1       | $S_{42}$   | M4x6mm FS42 Screws                                |
| 2       | $A_{42}$   | FS42 Adapter Plate                                |
| 3       | $S_A$      | M4x6mm Adapter Screws                             |
| 4       | $S_F$      | M4x6mm Flange Screws                              |
| 5       | $S_P$      | M4x8mm Pivot Screws (Pre-Installed)               |
| 6       | F          | Flanged Omega-shaped Tilt Mount Bracket Component |
| 7       | $S_L$      | Lock Screws                                       |
| 8       | $U_{SLOT}$ | U Bracket Pivot Slot                              |
| 9       | U          | U-Shaped Tilt Mount Bracket Component             |

## Configuring the ZIML with FS42

Configure the Zebra Integrated Multifunction Light (ZIML) for use with the FS42 Fixed Industrial Scanner using Aurora Focus. Ensure the ZIML is connected to Aurora Focus before attempting to configure ZIML with FS42.



**NOTE:** If you are configuring the FS42 with the Zebra Integrated Multifunction Light (ZIML), ensure you emit light from only one source at a time. For example, if you use the aimer on one device, disable it on the other. Beepers, LEDs, illumination sources, and aimers are mutually exclusive and must be configured individually on each device.



**NOTE:** Hidden Strobe is not available when using the ZIML with the 2MP version of the FS42.

1. Enable the ZIML on the FS42 using **Device Configuration > General** in Aurora Focus.
2. Enable the laser on the ZIML, depending on the model
3. Enable the beeper on the ZIML and configure volume, tone, and duration.
4. Enable the 360 LED status indicators on the ZIML and configure their triggering and flash behaviors.
5. Select Low or High Power.
6. Configure the number of flashes that illuminate during decode using the slider
7. Configure the amount of time (ms) the LED illuminates per flash during each decode (Default: 50 ms) using the slider

| Setting                                                     | Description                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Zebra Integrated Multifunction Light (ZIML) Settings</b> |                                                                                                                                                                                                                                                                              |
| Enable ZIML                                                 | Slide the toggle to enable the light and select the light model (Premium or Standard Model) from the drop-down.<br><br> <b>NOTE:</b> Configurable settings depend on the model.             |
| Enable Laser Aimer                                          | Click the checkbox to enable the laser aimer.                                                                                                                                                                                                                                |
| Beeper                                                      | Click the checkbox to enable the beeper.<br><ul style="list-style-type: none"> <li>• Beeper Volume (Default: High)</li> <li>• Beeper Tone (Default: Medium)</li> <li>• Beeper Duration (Default: Long)</li> </ul>                                                            |
| ZIML 360 LED Status Indicators                              | Click the checkbox to enable the 360 LED status indicators.<br>Click the checkbox to hold the indicators until the next trigger.<br>Configure the number of flashes (Default: 1).<br>Configure the amount of time (ms) the indicator illuminates per flash (Default: 50 ms). |
| ZIML Power Mode                                             | Select Low Power or High Power.                                                                                                                                                                                                                                              |
| <b>360° LED</b>                                             |                                                                                                                                                                                                                                                                              |
| Number of Flashes                                           | Use the slider to configure the number of flashes the LED illuminates upon decode.                                                                                                                                                                                           |
| Time per Flash                                              | Use the slider to configure the amount of time (ms) the LED illuminates per flash during each decode (Default: 50 ms).                                                                                                                                                       |



**NOTE:** For additional information on using Aurora Focus, refer to the Aurora Focus User Guide.

## Enabling Hidden Strobe

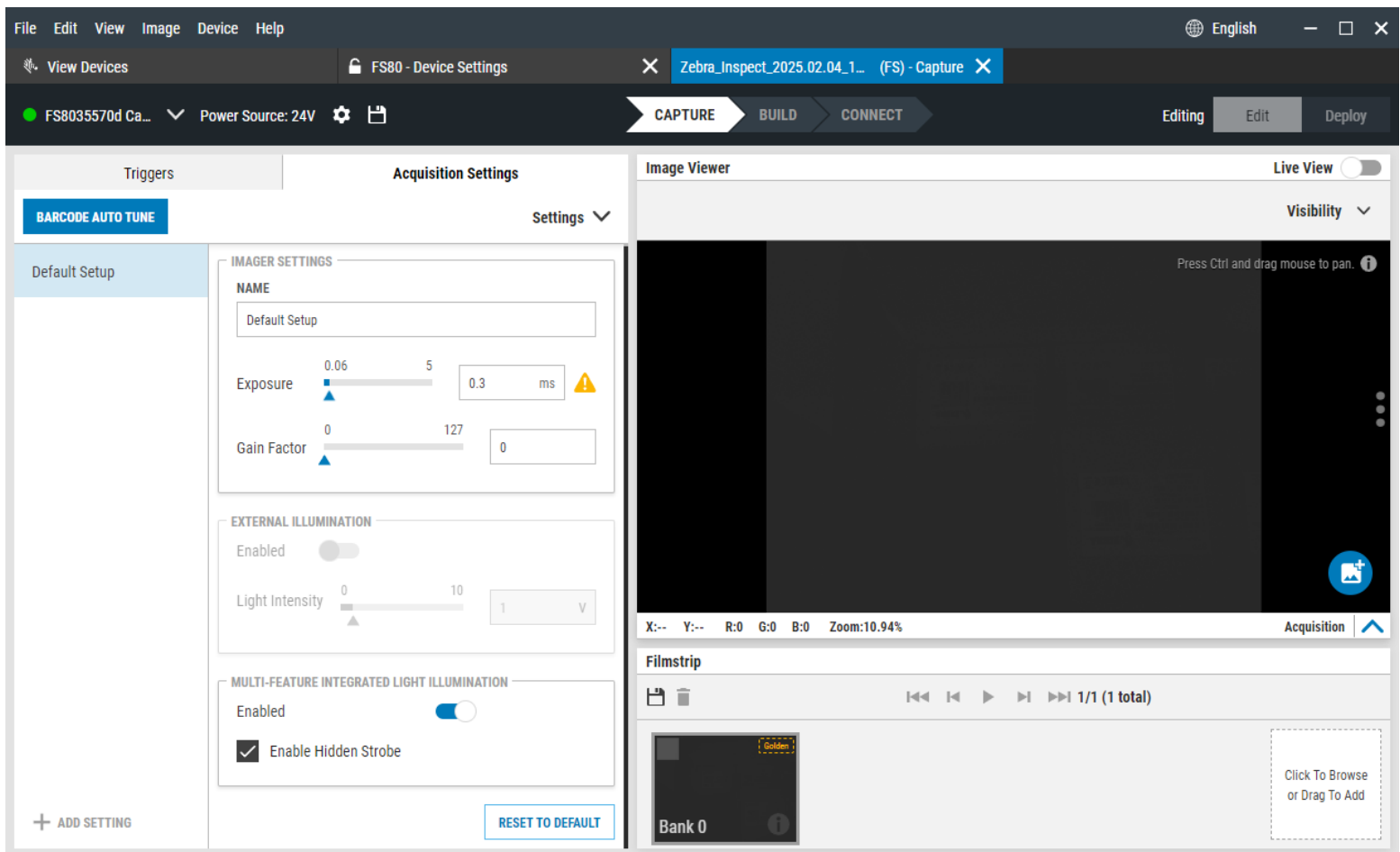
Use Aurora Focus to enable Hidden Strobe on the Zebra Integrated Multifunction Light by configuring job settings.



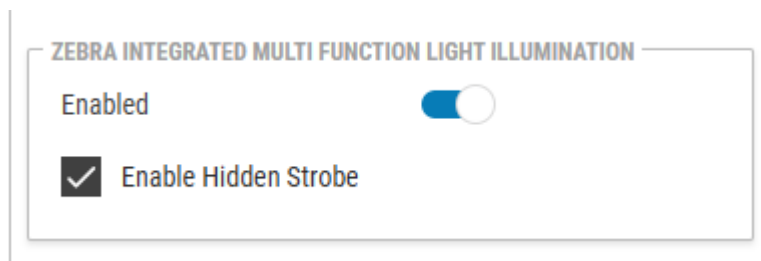
**NOTE:** Hidden Strobe is not available when using the ZIML with the 2MP version of the xS42.

# Installation

1. Navigate to the **Capture** tab in job settings.
2. Click the **Acquisition Settings** tab.



3. Enable **Integrated Multifunction Light Illumination** by sliding the toggle switch to the right.
4. Enable Hidden Strobe by clicking the checkbox.



**NOTE:** Enabling **Integrated Multifunction Light Illumination** is required for light operation.

# Using the Device

This section includes GPIO wire diagrams to connect the scanner and power and thermal management strategies to ensure its efficient operation.

## USB Type C

USB Type C allows for novel and cost-effective installations provided the following constraints are acceptable:

- Digital GPIO are unavailable.
- Optocoupled GPIO is still functional, provided the COMMON\_IN and COMMON\_OUT are properly terminated.
- The External Light Connector is disabled and cannot be used in GPIO or External Light modes.
- 0 V to 10 V analog output is disabled.
- Illumination is limited or requires a USB power source with further capabilities to be enabled at any capacity.



**NOTE:** The device boots from legacy USB host ports. However, the current draw is not guaranteed to be under 500 mA, and device functionality may be restricted to the extent that performance can be impaired. An override mode can be enabled for legacy host ports that are known by the operator to be capable of supplying up to 1.5 A. Ports of this type are often described as having USB BC1.2 or USB charging support.

## USB Type C Operation

The devices implement a full capability 5 Gbps USB 3.0 USB Type C port with support for DisplayPort Alt Mode. The sealed port implements a standard USB Type C dual screw lock mechanism for secure connections. When paired with the IP67 series of Zebra screw locking cables, the interface maintains a full IP67 seal.



**NOTE:** The sealing gasket on IP67 series Zebra USB Type-C cables requires sufficient pressure for proper sealing and connector engagement. Always tighten the locking screws when using these cables, even if IP67 sealing is not required.

When connected as a peripheral to a USB host, the devices can be configured to support the following functionality:

- RNDIS Ethernet over USB

- USB-CDC or HID keyboard (configurable using Windows device settings)

When operating as a host, the USB Type C port supports many types of accessories and functionality, including:

- Native USB-C displays
- USB-C to Display Port and USB-C to HDMI adapters
- HID-compliant keyboards and trackpads
- USB mass storage devices for firmware updates
- USB docks and hubs



**NOTE:** High-speed charging cables typically do not have the necessary data wires for DisplayPort functionality.

### Supported Display Resolutions

Display resolution is automatically negotiated upon connection. Displays with at least 1920 x 1080 resolution provide the preferred user experience.

The FS/VS Smart Camera series supports the following resolutions:

- 1024 x 768
- 1280 x 800
- 1280 x 1024
- 1366 x 768
- 1600 x 900
- 1600 x 1050
- 1920 x 1080
- 1920 x 1200



**NOTE:** Monitors with USB-C input offer an efficient method for quick and easy configuration over a single USB Type C to Type C cable. An attached device powers directly from the monitor's USB Power Delivery and outputs the Human Machine Interface (HMI) directly to the display. A USB mouse and keyboard attached to the monitor hub ports provide the user with interface control. Battery-powered portable USB Type C monitors are also compatible for easy status or manipulation in the field.

### User Interface

The device is compatible with 24VDC power supplies and PoE injectors.

## User Interface Label

The User Interface (UI) label uses LEDs to provide information on device state and feedback. Two sensor PCB switches control the device's trigger and tune buttons. The TRIG switch acts as a trigger, and the TUNE switch adjusts and optimizes focus.

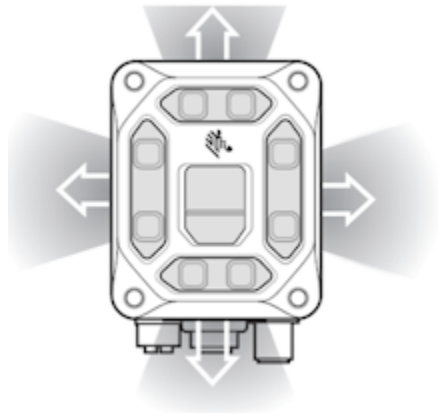
**Figure 13** UI Label



|   |                     |
|---|---------------------|
| 1 | Power               |
| 2 | Power over Ethernet |
| 3 | Device Status       |
| 4 | Focus Status        |
| 5 | Warning             |

## Decode LEDs

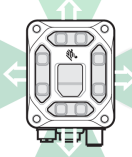
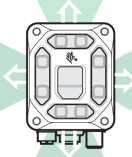
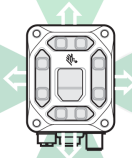
The device has a 360° LED decode indicator that flashes green upon successful decode and red upon job failure.

**Figure 14** 360° LEDs

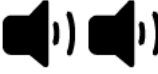
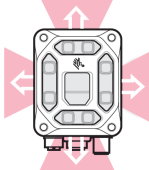
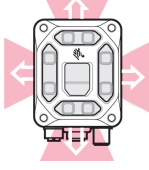
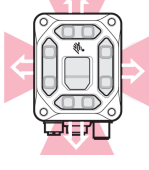
## LED and Beeper Indicators

The following table describes the LED and beeper indications of the FS/VS Smart Camera upon device events such as power-up, running a job, maintenance operations, and parameter programming.

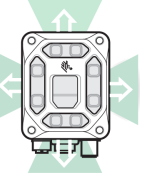
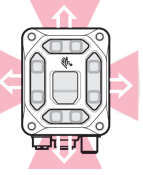
**Table 14** LED and Beeper Indications

| Event                                        | Beeper                                                                                                        | 360° LED                                                                                                  | Power LED                                                                                           | Device Status LED | Focus Status LED | Warning LED |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------|------------------|-------------|
| <b>Power Up</b>                              |                                                                                                               |                                                                                                           |                                                                                                     |                   |                  |             |
| Power up with Low Power                      | <br>Low, Medium, High Tone | <br>Single Green Blink | <br>Solid Red   | -                 | -                | -           |
| Power up with Limited Power (USB or 15W PoE) | <br>Low, Medium, High Tone | <br>Single Green Blink | <br>Solid Amber | -                 | -                | -           |
| Power up with Full Power (24V or 30W PoE)    | <br>Low, Medium, High Tone | <br>Single Green Blink | <br>Solid Green | -                 | -                | -           |

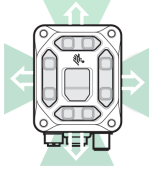
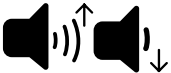
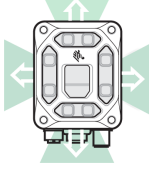
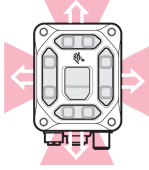
**Table 14** LED and Beeper Indications (Continued)

| Event                      | Beeper                                                                                                   | 360° LED                                                                                                          | Power LED                                                                                           | Device Status LED                                                                                                   | Focus Status LED | Warning LED                                                                                      |
|----------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------|--------------------------------------------------------------------------------------------------|
| Job Error                  | <br>Low, Low Tone       | -                                                                                                                 | <br>Solid Green   | <br>Solid Red                    | -                | <br>Solid Red |
| <b>Device Maintenance</b>  |                                                                                                          |                                                                                                                   |                                                                                                     |                                                                                                                     |                  |                                                                                                  |
| Factory Reset              | <br>Medium, Medium Tone | <br>Continuous Red Flash (5hz)   | <br>Solid Green   | -                                                                                                                   | -                | -                                                                                                |
| <b>Firmware Operations</b> |                                                                                                          |                                                                                                                   |                                                                                                     |                                                                                                                     |                  |                                                                                                  |
| Firmware Update Start      | -                                                                                                        | <br>Continuous Red Flash (2hz)  | <br>Solid Green  | <br>Continuous Red Flash (2hz)  | -                | -                                                                                                |
| Firmware Update Success    | -                                                                                                        | -                                                                                                                 | <br>Solid Green | -                                                                                                                   | -                | -                                                                                                |
| Firmware Update Fail       | <br>Low Tone          | <br>Continuous Red Flash (5hz) | <br>Solid Green | <br>Continuous Red Flash (5hz) | -                | -                                                                                                |
| <b>Autotune Operations</b> |                                                                                                          |                                                                                                                   |                                                                                                     |                                                                                                                     |                  |                                                                                                  |

**Table 14** LED and Beeper Indications (Continued)

| Event                               | Beeper                                                                                             | 360° LED                                                                                                  | Power LED                                                                                           | Device Status LED                                                                                   | Focus Status LED                                                                                              | Warning LED |
|-------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------|
| AutoTune Start                      | <br>Medium Tone   | -                                                                                                         | <br>Solid Green   | -                                                                                                   | <br>Continuous Green (2Hz) | -           |
| AutoTune Success                    | <br>High Tone     | -                                                                                                         | <br>Solid Green   | -                                                                                                   | <br>Solid Green            | -           |
| AutoTune Fail                       | <br>Low Tone      | -                                                                                                         | <br>Solid Green   | -                                                                                                   | <br>Solid Red              | -           |
| <b>Decode</b>                       |                                                                                                    |                                                                                                           |                                                                                                     |                                                                                                     |                                                                                                               |             |
| Barcode Decode <sup>1</sup> Start   | -                                                                                                  | -                                                                                                         | <br>Solid Green  | <br>Solid Amber | -                                                                                                             | -           |
| Barcode Decode <sup>1</sup> Success | <br>Medium Tone | <br>Single Green Flash | <br>Solid Green | -                                                                                                   | -                                                                                                             | -           |
| Barcode Decode Failure              | -                                                                                                  | <br>Single Red Flash   | <br>Solid Green | -                                                                                                   | -                                                                                                             | -           |
| <b>Parameter Programming</b>        |                                                                                                    |                                                                                                           |                                                                                                     |                                                                                                     |                                                                                                               |             |

**Table 14** LED and Beeper Indications (Continued)

| Event                                     | Beeper                                                                                                         | 360° LED                                                                                                | Power LED | Device Status LED                                                                                  | Focus Status LED | Warning LED |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------|------------------|-------------|
| Parameter Entry Accepted                  | <br>High, Low, High, Low Tone | <br>Single Green Blink | -         | <br>Solid Green | -                | -           |
| Parameter Number Entry Expecting Barcodes | <br>High, Low Tone            | <br>Single Green Blink | -         | <br>Solid Green | -                | -           |
| Parameter Entry Error                     | <br>Low, High Tone            | <br>Single Red Blink  | -         | <br>Solid Green | -                | -           |

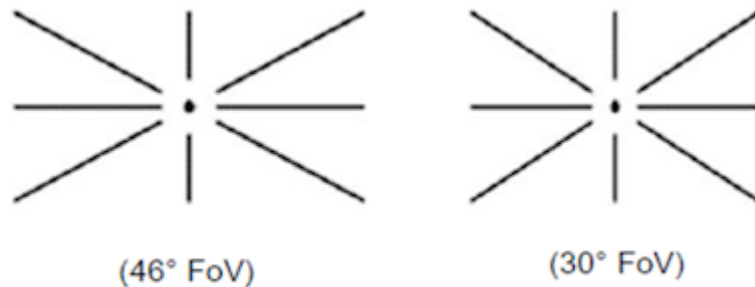


**NOTE:**<sup>1</sup> This is the default, Barcode Decode Success and Barcode Decode Failure beeper UI feedback is configurable in Aurora Focus.

## Aiming Patterns

The aimer indicates the center and size of the field of view, including diagonal corners 24 in. away from the subject.

The device has a red Class II laser aimer that generates the pattern shown in the following figure.

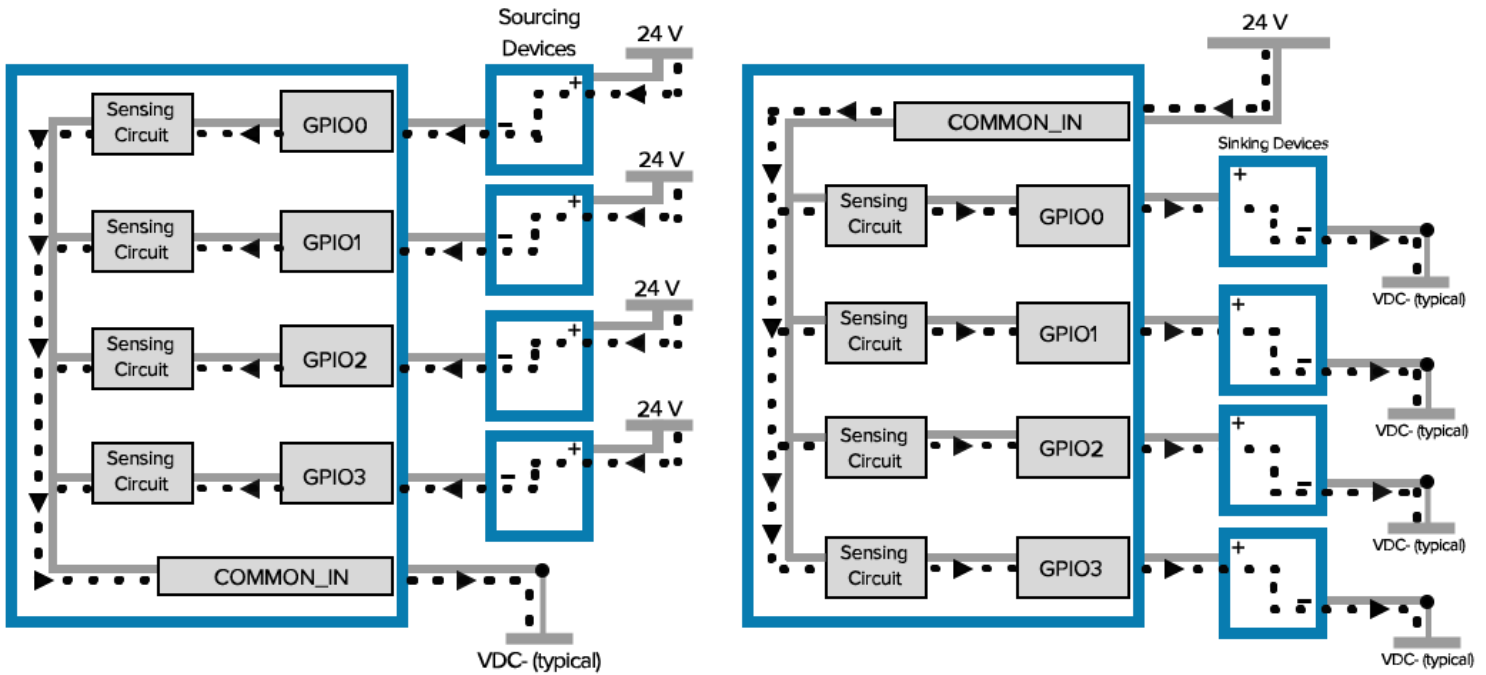
**Figure 15** Aiming Patterns

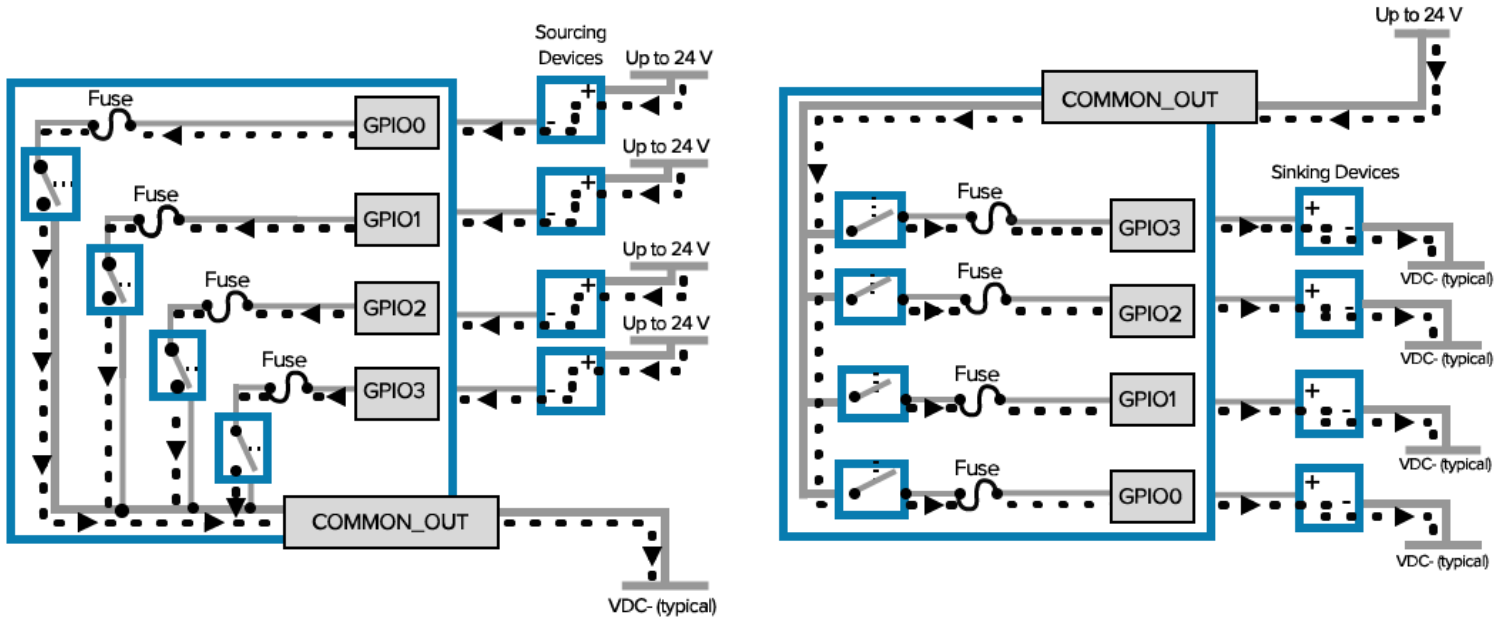
## General Purpose Input and Outputs

The device has two types of general-purpose inputs and outputs (GPIO).

GPIO0 through GPIO3 are optically coupled to provide electrical isolation and wiring flexibility. GPIO4 through GPIO8 are 24 V Digital GPIO, which are not isolated and source power from the external power supply or Power over Ethernet (PoE). Digital GPIO is unavailable when the system is powered by USB. However, optocoupled GPIOs remain functional when COMMON\_IN and COMMON\_OUT are terminated appropriately.

**Figure 16** Opto-Isolated Inputs



**Figure 17** Opto-Isolated Outputs


## GPIO Summary

**Table 15** GPIO Summary

| Hardware | PIN   | Conn.  | Iso | Input Mode |            |                  | Output Mode      |           |                    |           |
|----------|-------|--------|-----|------------|------------|------------------|------------------|-----------|--------------------|-----------|
|          |       |        |     | Sink PNP   | Source NPN | Sink NPN         | Source PNP       | Push-Pull | Max. Current       | USB Power |
| Opto     | GPIO0 | 12 Pin | Yes | Yes        | Yes        | Yes              | Yes              | No        | 50mA               | Yes       |
| Opto     | GPIO1 | 12 Pin | Yes | Yes        | Yes        | Yes              | Yes              | No        | 50mA               | Yes       |
| Opto     | GPIO2 | 12 Pin | Yes | Yes        | Yes        | Yes              | Yes              | No        | 50mA               | Yes       |
| Opto     | GPIO3 | 12 Pin | Yes | Yes        | Yes        | Yes              | Yes              | No        | 50mA               | Yes       |
| Digital  | GPIO4 | 12 Pin | No  | Yes        | No         | Yes <sup>2</sup> | Yes <sup>2</sup> | Yes       | 100mA <sup>1</sup> | No        |
| Digital  | GPIO5 | 12 Pin | No  | Yes        | No         | Yes <sup>2</sup> | Yes <sup>2</sup> | Yes       | 100mA <sup>1</sup> | No        |
| Digital  | GPIO6 | 5 Pin  | No  | Yes        | No         | Yes <sup>2</sup> | Yes <sup>2</sup> | Yes       | 100mA <sup>1</sup> | No        |
| Digital  | GPIO7 | 5 Pin  | No  | Yes        | No         | Yes <sup>2</sup> | Yes <sup>2</sup> | Yes       | 100mA <sup>1</sup> | No        |
| Digital  | GPIO8 | 5 Pin  | No  | Yes        | No         | Yes <sup>2</sup> | Yes <sup>2</sup> | Yes       | 100mA <sup>1</sup> | No        |



**NOTE:** <sup>1</sup> Digital outputs consume power, reducing the available power budget for illumination. It is recommended to disable unused outputs when using PoE.



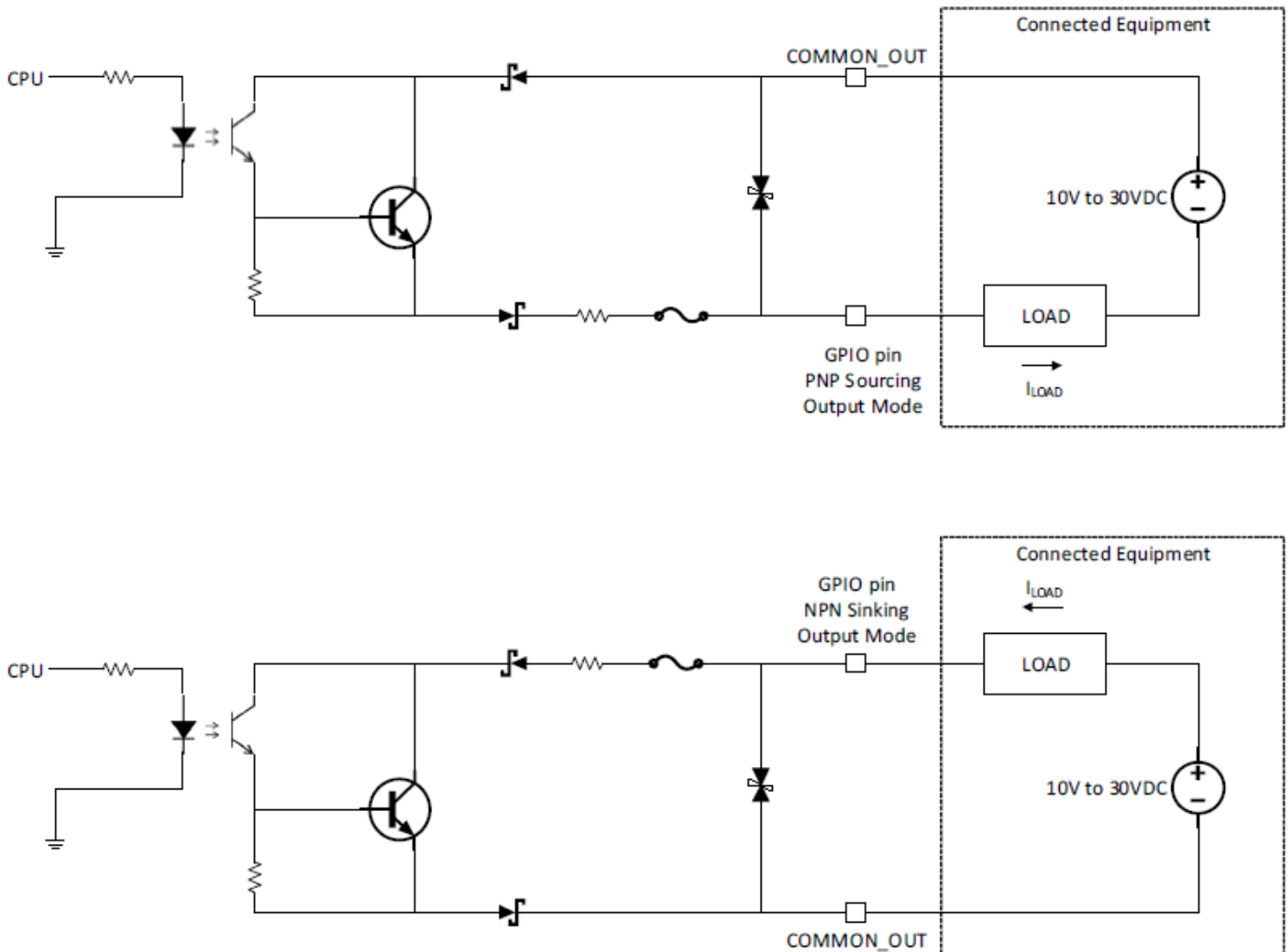
**NOTE:**<sup>2</sup> Push-pull output is compatible with auxiliary equipment having NPN inputs referenced to GND or PNP inputs referenced to DC IN.

## Optically Coupled GPIO

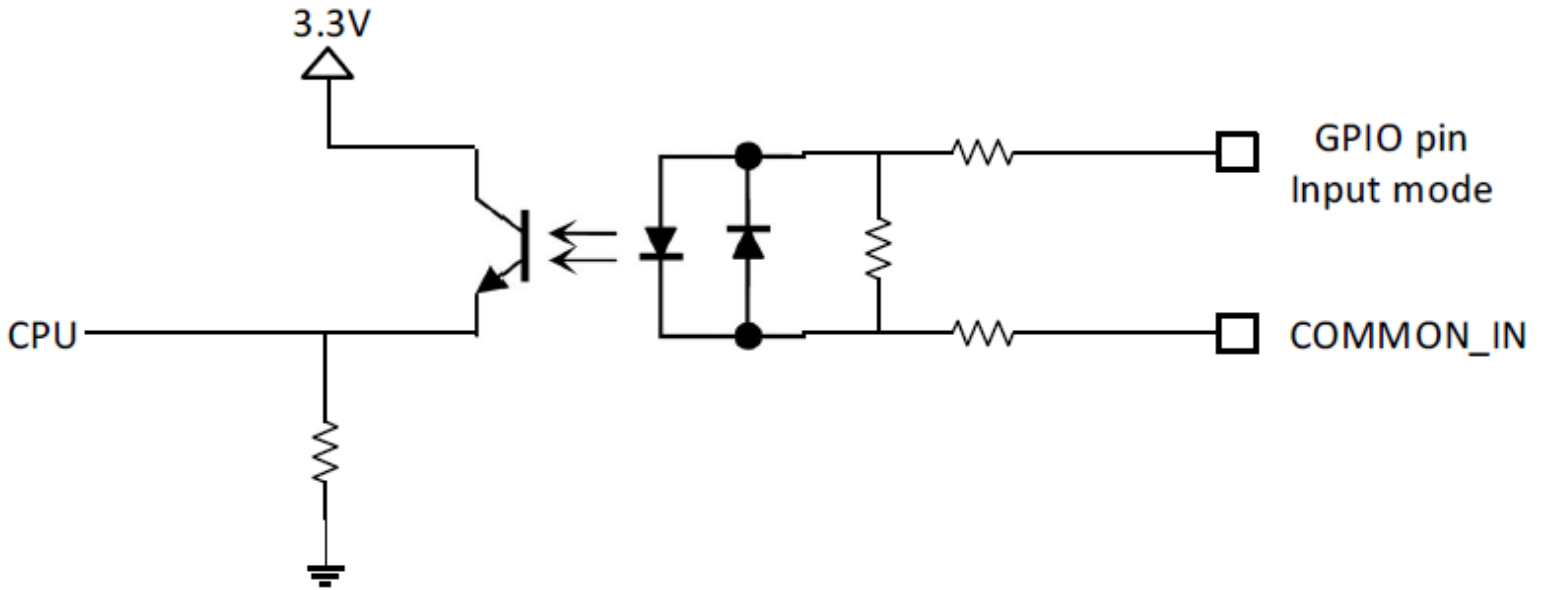
Optocoupled GPIO are electrically isolated from the rest of the system and require external reference through the COMMON\_IN and COMMON\_OUT wires.

The termination of COMMON\_IN and COMMON\_OUT to an external voltage or ground determines if the input or output is Sinking type or Sourcing type.

In output mode, the GPIO performs similarly to switches connecting the GPIO pin to COMMON\_OUT. When disabled, the GPIO pin is disconnected from COMMON\_OUT and allowed to float. As a result, optocoupled outputs turn on quickly, while the turn-off time depends on how quickly the connected load dissipates the charge



Optocoupled inputs are enabled when voltage is applied across the GPIO pin and COMMON\_IN.



Optocoupled GPIO can operate non-isolated by terminating COMMON\_IN and COMMON\_OUT to the DC\_IN or GND wires that power the device.

**Table 16** Connection References

| Wire       | Termination | Configuration         |
|------------|-------------|-----------------------|
| COMMON_IN  | GND         | Sinking Input (PNP)   |
| COMMON_IN  | DC_IN       | Sourcing Input (NPN)  |
| COMMON_OUT | GND         | Sinking Output (NPN)  |
| COMMON_OUT | DC_IN       | Sourcing Output (PNP) |

While it is possible to configure inputs and outputs of the same type, this is not recommended as inputs and outputs must be of opposite type to be compatible. All optocoupled GPIO share the COMMON\_IN for input mode and COMMON\_OUT for output mode. Therefore, all inputs must be of the same type and all outputs must be of the same type. For example, it is not possible to simultaneously configure sinking output on GPIO0 and sourcing output on GPIO1.

In practice, sinking inputs paired with sourcing outputs is common. This combination is compatible with widely available digital industrial GPIO, which typically only support sinking-type inputs.



**NOTE:** Refer to the documentation of the connected auxiliary equipment to ensure a compatible configuration, and remember to leave unused GPIO in a disabled state.

Optocoupled outputs are individually fused to protect against damage from short circuits or overload events. Since no power is consumed from the vision system, optocoupled GPIO have no impact on power budgeting.

## Digital Industrial GPIO

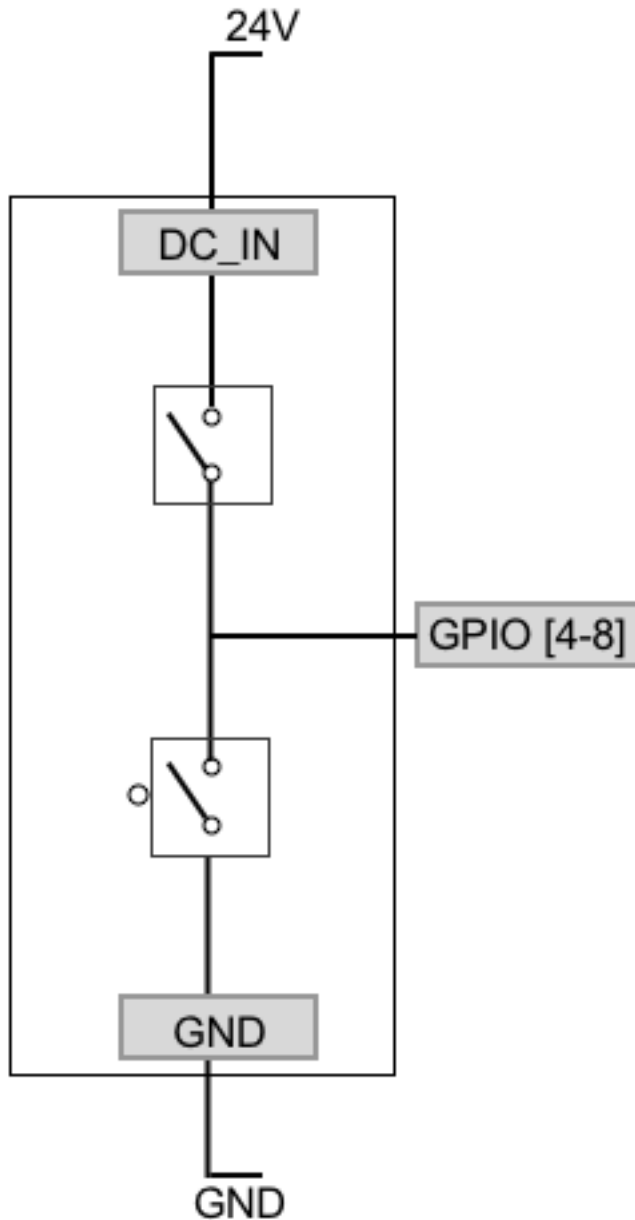
Unlike optocoupled GPIO, digital GPIO actively drive the output signal high and low for significantly faster turn-on and turn-off time. Digital GPIO is not isolated and references the power supply and

ground of the system. COMMON\_IN and COMMON\_OUT do not need to be terminated to use digital GPIO.



**NOTE:** Refer to the documentation of the connected auxiliary equipment to ensure a compatible configuration, and remember to leave unused GPIOs disabled.

**Figure 18** Digital Outputs (Non-Isolated)



**NOTE:** A digital GPIO can be configured as a 24 V output and wired back into COMMON\_IN or COMMON\_OUT to create the necessary bias voltage to operate an optocoupled GPIO when PoE powers the system. Knowing the 100 mA total current budget per digital GPIO is essential when attaching loads to any optocoupled outputs powered this way.

Digital inputs on the devices are of the sinking (PNP) input type and do not support the less common sourcing (NPN) input configuration. Voltage above the specified threshold relative to the vision system

ground must be applied for a logic high to register. Drive these inputs with a sourcing (PNP) or push-pull output.

Configuring the 5-pin M12 External Light connector to GPIO Mode makes GPIO6 through GPIO8 available for general use. Configuring the External Light connector to External Light Mode switches GPIO8 into a high current output to provide power and sets up GPIO6 and GPIO7 to control the connected light.

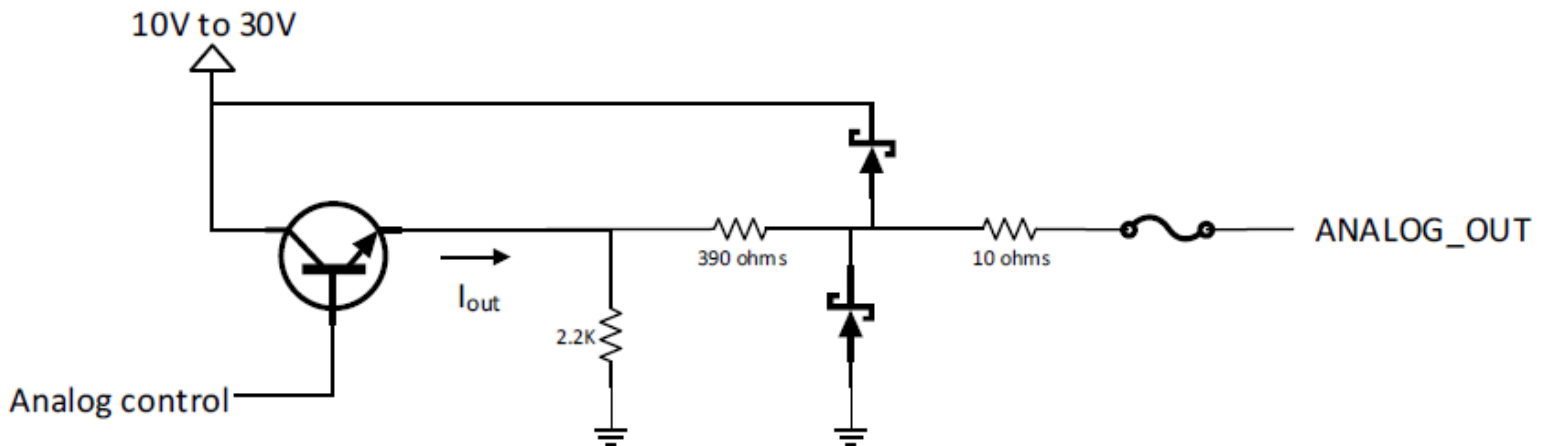


**NOTE:** When a 24VDC external power supply powers the vision system, and the External Light connector is configured for External Light mode, GPIO8 operates in a bypass mode capable of shunting input power directly to high-power strobe lights. High peak currents are possible with adequate power supply capability, minimized cable losses, and observing the duty cycle limits that keep the average current in the system below 1500 mA.

## Analog Output

The system has an analog output on the External Light connector capable of generating between 0 V and 10 V.

An output impedance of approximately 400 ohms protects the analog output driver against overload conditions. However, this introduces an output voltage offset directly proportional to the output current. For optimal accuracy, connect devices with low input bias current.



## GPIO Wire Diagrams

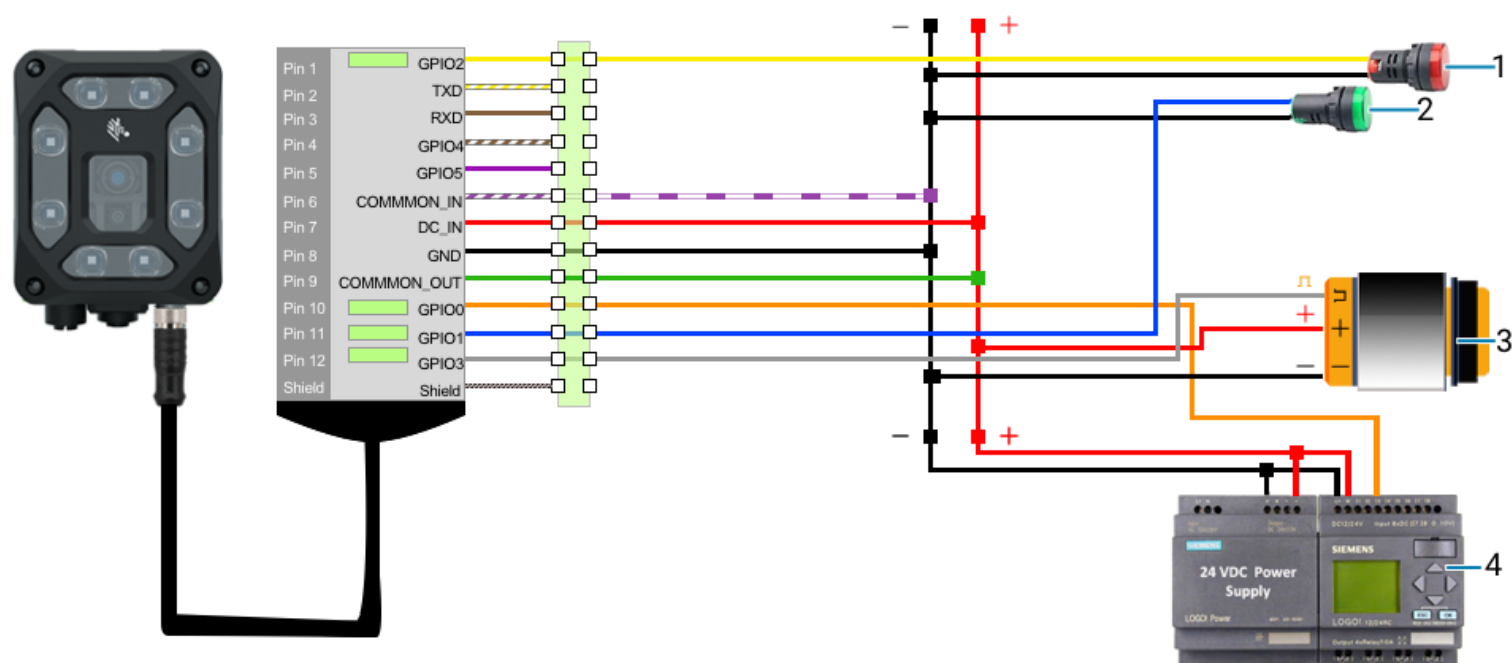
The diagrams in this section describe GPIO wiring with the Output as Current Source and as Current Sink.

### Output as Current Source

The following diagram displays a configuration with GPIO 3 set to Input and GPIO0, GPIO1, and GPIO2 set to Output.

The GPIO Outputs are the Current Source (PNP), and the GPIO Input is the Current Sink (PNP). Input is received from a PNP proximity sensor. The power source is a PLC 24VDC PSU, and the GPIO functions are not opto-isolated.

**Figure 19** Output as Current Source / Input as Current Sink



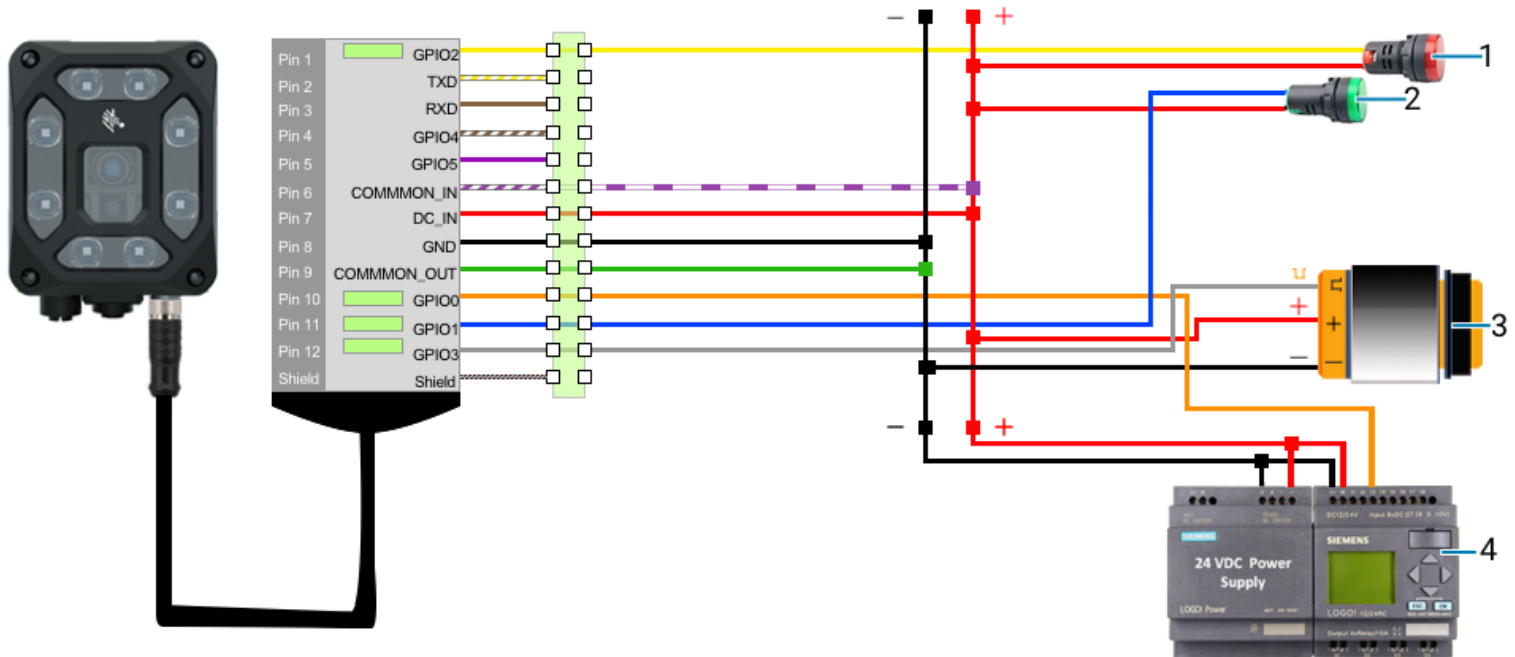
|   |                      |
|---|----------------------|
| 1 | Job Fail             |
| 2 | Job Pass             |
| 3 | PNP Proximity Sensor |
| 4 | Power Supply         |

## Output as Current Sink

The following diagram displays a configuration with GPIO 3 set to Input and GPIO1, GPIO2, and GPIO3 set to Output.

The GPIO Outputs are the Current Sink (NPN), and the GPIO Input is the Current Source (NPN). Input is received from an NPN proximity sensor. The power source is a PLC 24VDC PSU, and the GPIO functions are not opto-isolated.

**Figure 20** Output as Current Sink / Input as Current Source



|   |                      |
|---|----------------------|
| 1 | Job Fail             |
| 2 | Job Pass             |
| 3 | NPN Proximity Sensor |
| 4 | Power Supply         |

## Power and Thermal Management

Algorithms keep the system within acceptable power and thermal parameters to ensure reliable operation over the device's lifetime.



**CAUTION:** A warning indicates if the available power budget is inadequate for the configured settings. In some cases, the user can choose to ignore or override the warning. In this case, the integrator should evaluate the operational stability of the system.

If the device temperature exceeds a safe limit, the system response may include disabling certain features, reducing processor performance, or stopping active jobs.

If overheating is a problem, effective mitigation strategies include:

- Reducing the average system power consumption
- Using external illumination
- Avoiding operating from PoE
- Operating in a cooler environment
- Actively cooling with a fan
- Heatsinking the chassis to a large thermally conductive mounting surface through a thermally conductive mounting system

For optimal performance, ensure that the device does not exceed the recommended operating ranges stated below.

**Table 17** Operating Temperature

| Temperature         | Operating Range                                                                        |
|---------------------|----------------------------------------------------------------------------------------|
| Ambient Temperature | 0°C to 40°C (POE, duty cycle-dependent)<br>0°C to 45°C (non-POE, duty cycle-dependent) |



**NOTE:** If temperatures exceed the operating range, additional heatsinking strategies may be necessary, for example, mounting to a metal infrastructure or forced convection via an external fan. The Zebra Universal Mounting Bracket (BRKT-LMNT-U000) provides multiple mounting options for a metal infrastructure.

## Symbologies

The following table lists supported symbologies for the devices.

**Table 18** Supported Symbologies

| Type | Symbologies                                                                                         |
|------|-----------------------------------------------------------------------------------------------------|
| 1D   | Codabar, Code 39, Code 93, Code 128, Interleaved 2 of 5, MSI, UPC/EAN, Discrete 2 of 5, GS1 Databar |
| 2D   | Aztec, Data Matrix, DotCode, MaxiCode, PDF417, QR Code                                              |
| OCR  | Deep Learning-based OCR                                                                             |



**NOTE:** Deep Learning OCR supports Latin characters and is available through an add-on license.

## Fixed Industrial Scanning Toolset

The following tools are available with a specific license type.

**Table 19** Fixed Industrial Scanning Tools

| Feature           | Toolset     |         |                  |     |
|-------------------|-------------|---------|------------------|-----|
|                   | Standard 2D | Fast 2D | DPM with Fast 2D | OCR |
| Barcode Reading   | X           | X       | X                |     |
| 5 fps only        | X           |         |                  |     |
| Fast 2D (60 fps)  |             | X       | X                |     |
| DPM               |             |         | X                |     |
| Locate Object     |             |         |                  | X   |
| Deep Learning OCR |             |         |                  | X   |

## Reading Diagrams

This section provides reading distances for 2 and 5MP standard range and wide angle configurations while scanning Code128 and ECC 200 barcodes.

### Standard Range

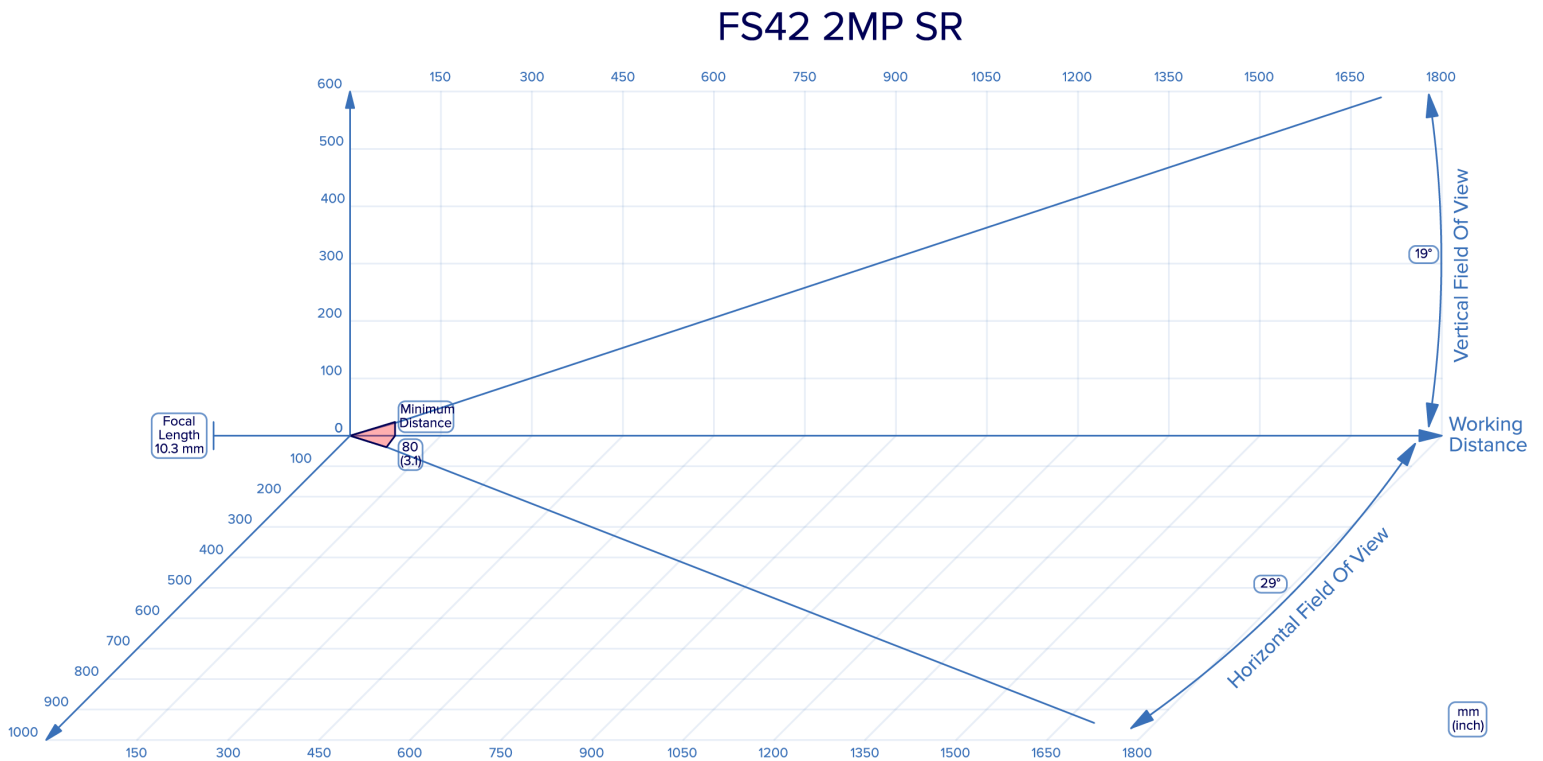
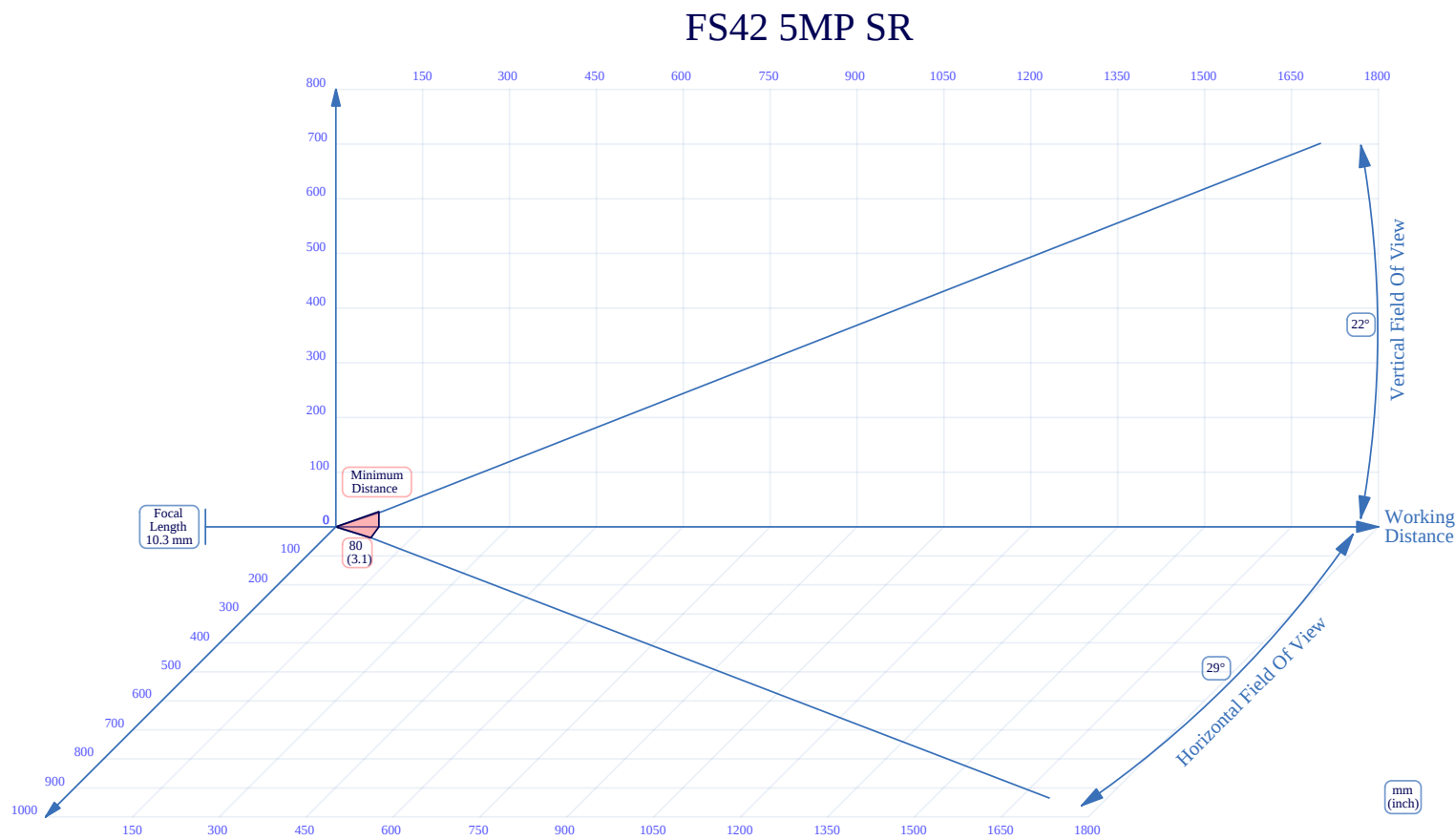
**Figure 21** 2MP Standard Range

Figure 22 5MP Standard Range



## Standard Range - Code128

**Figure 23** 2MP Standard Range Code128

### FS42 2MP SR - Code128

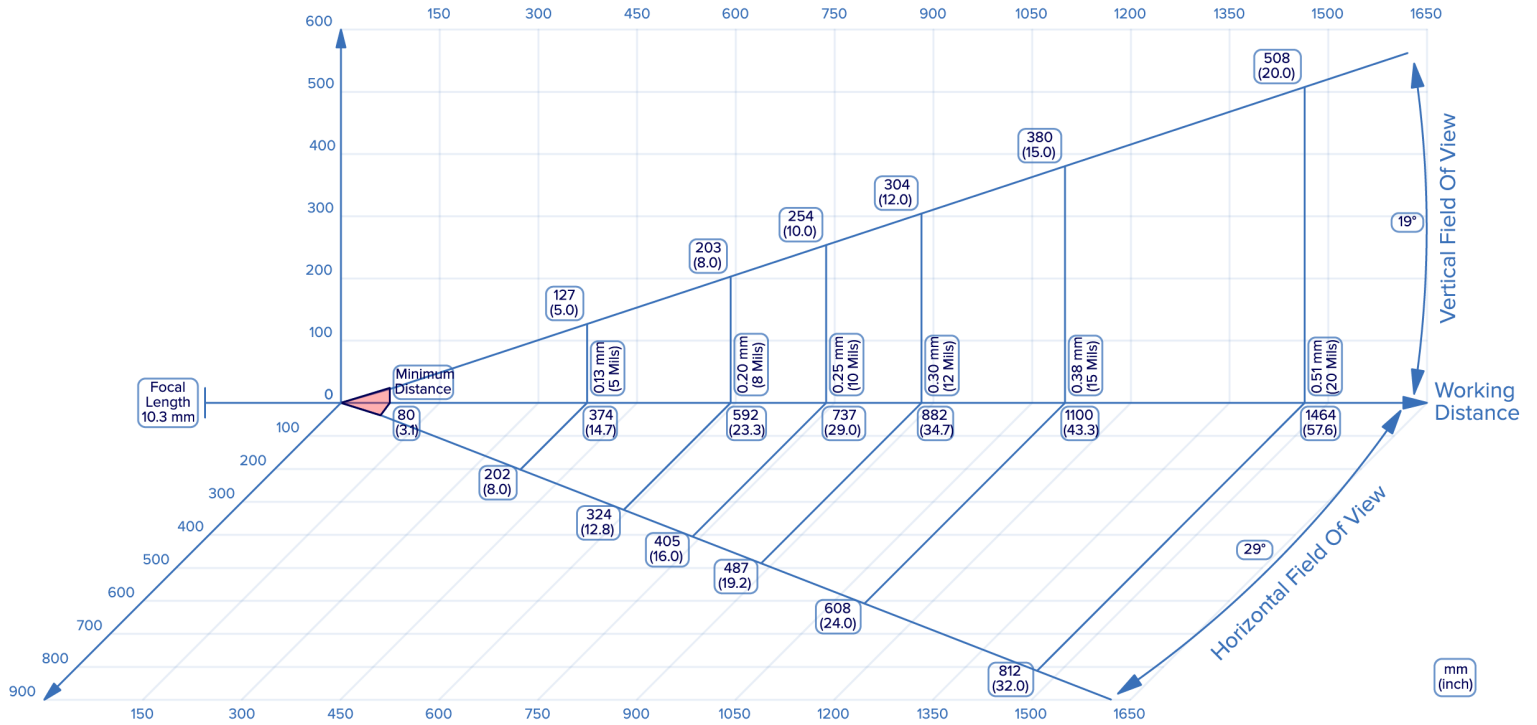
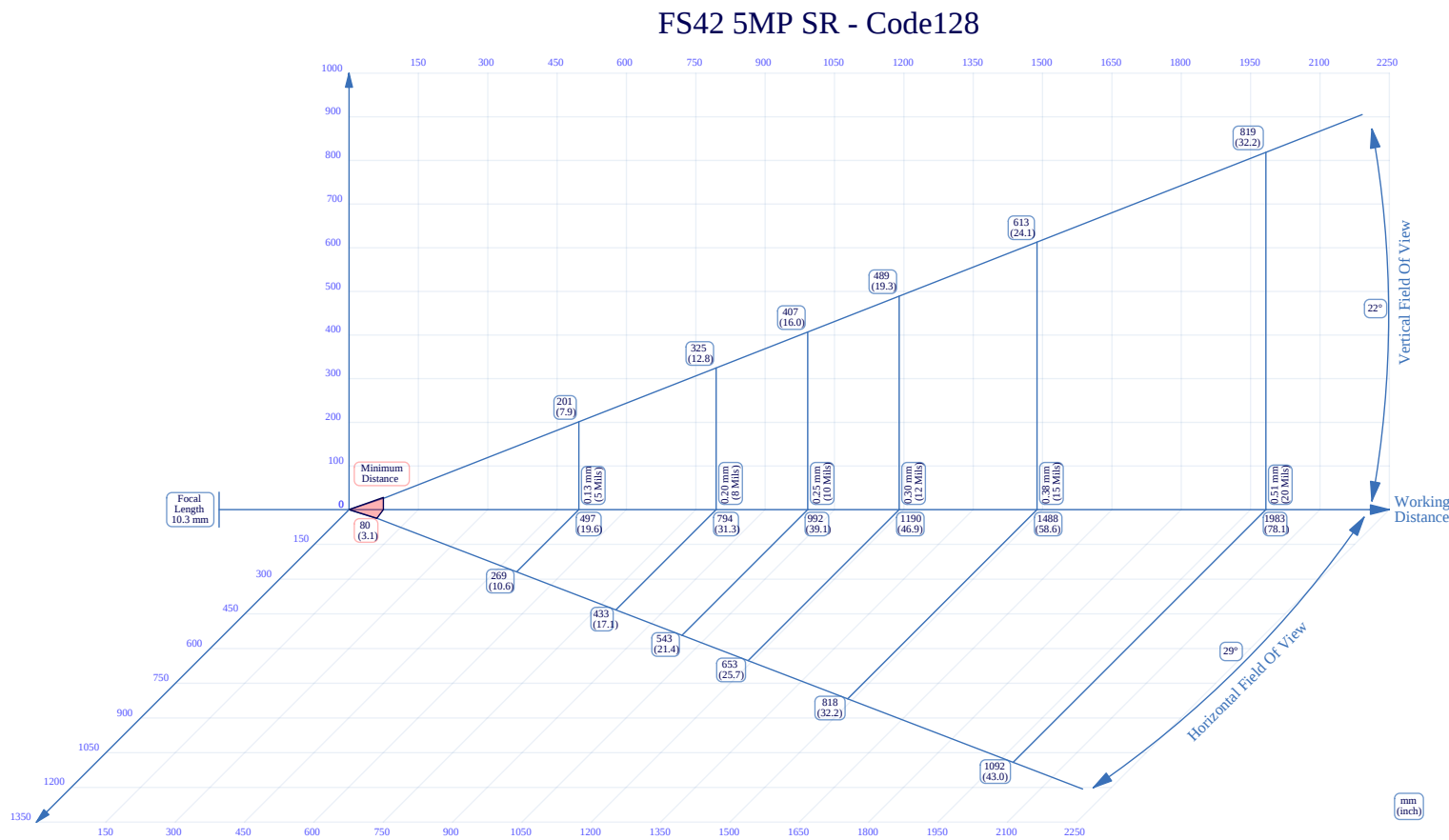


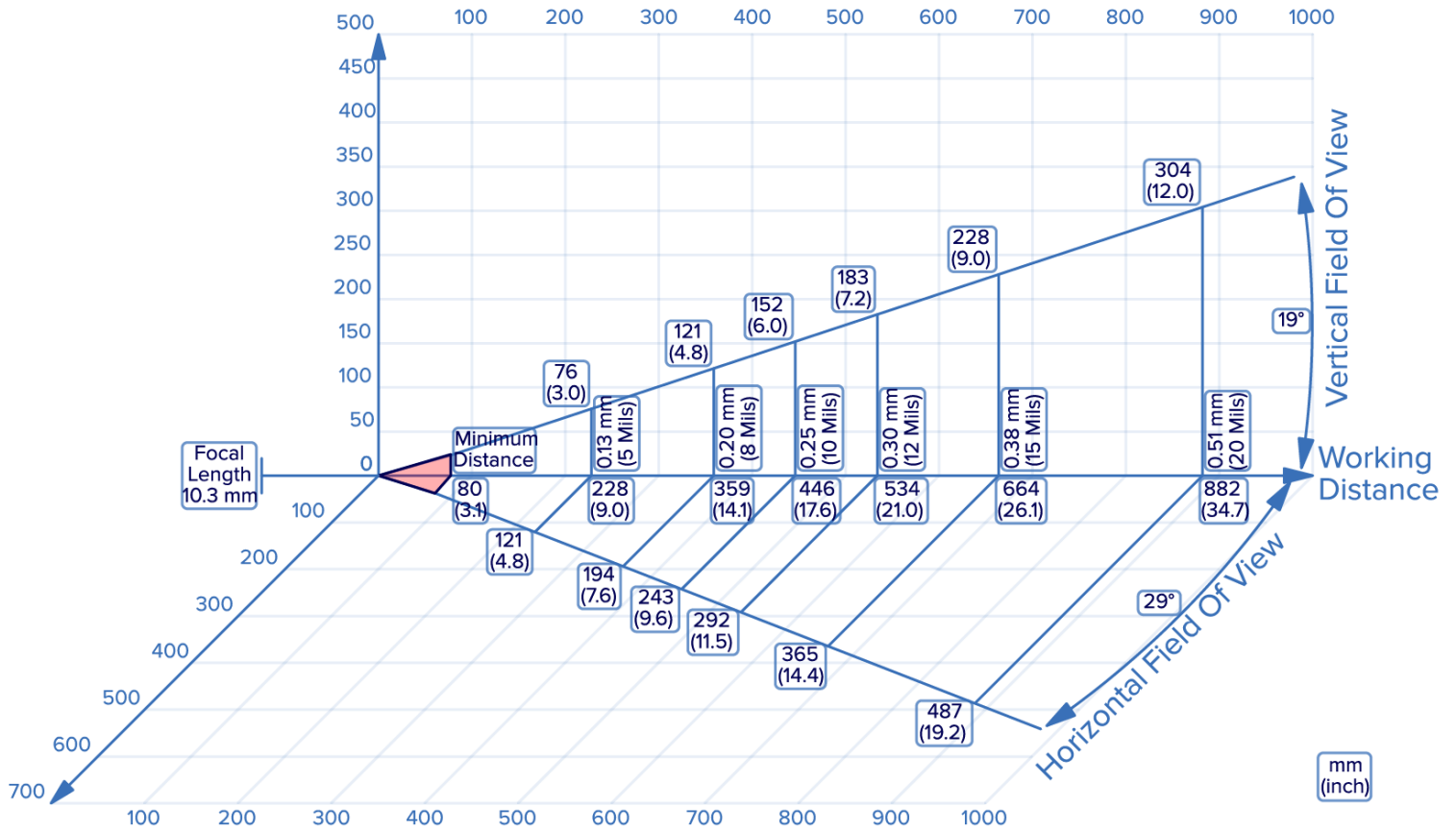
Figure 24 5MP Standard Range Code128



Standard Range - ECC 200

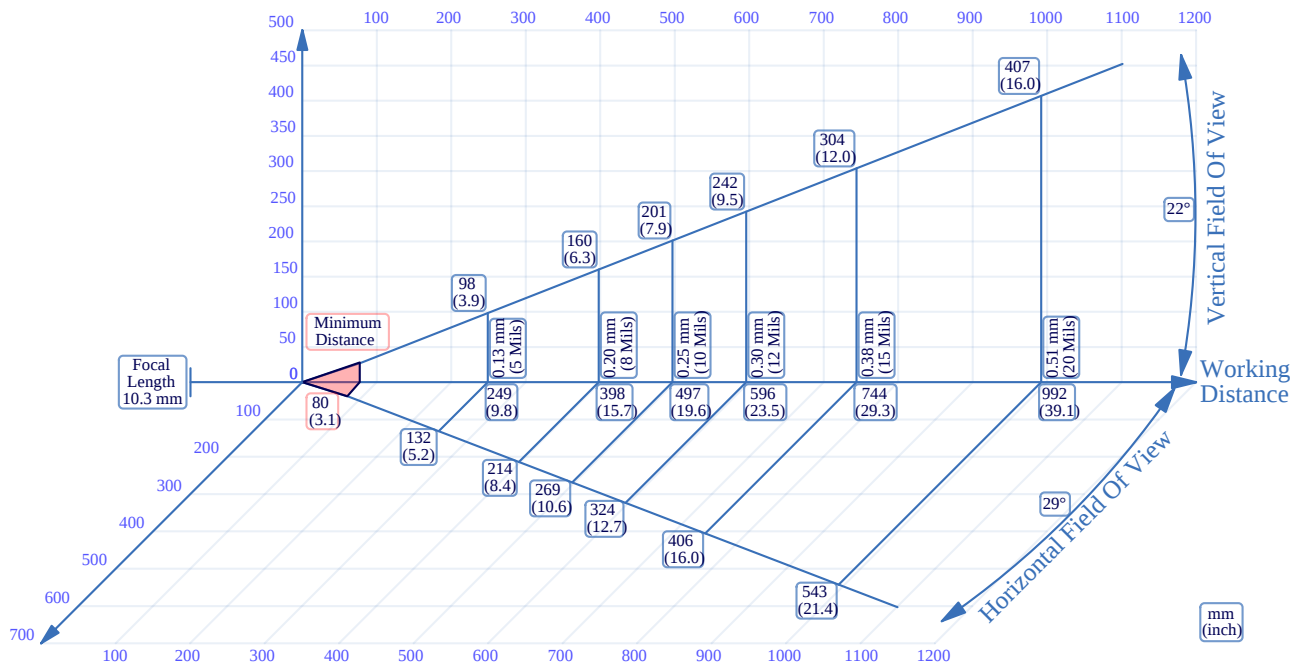
Figure 25 2MP Standard Range ECC 200

# FS42 2MP SR - ECC 200



**Figure 26** 5MP Standard Range ECC 200

## FS42 5MP SR - ECC 200



Wide Angle

Figure 27 2MP Wide Angle

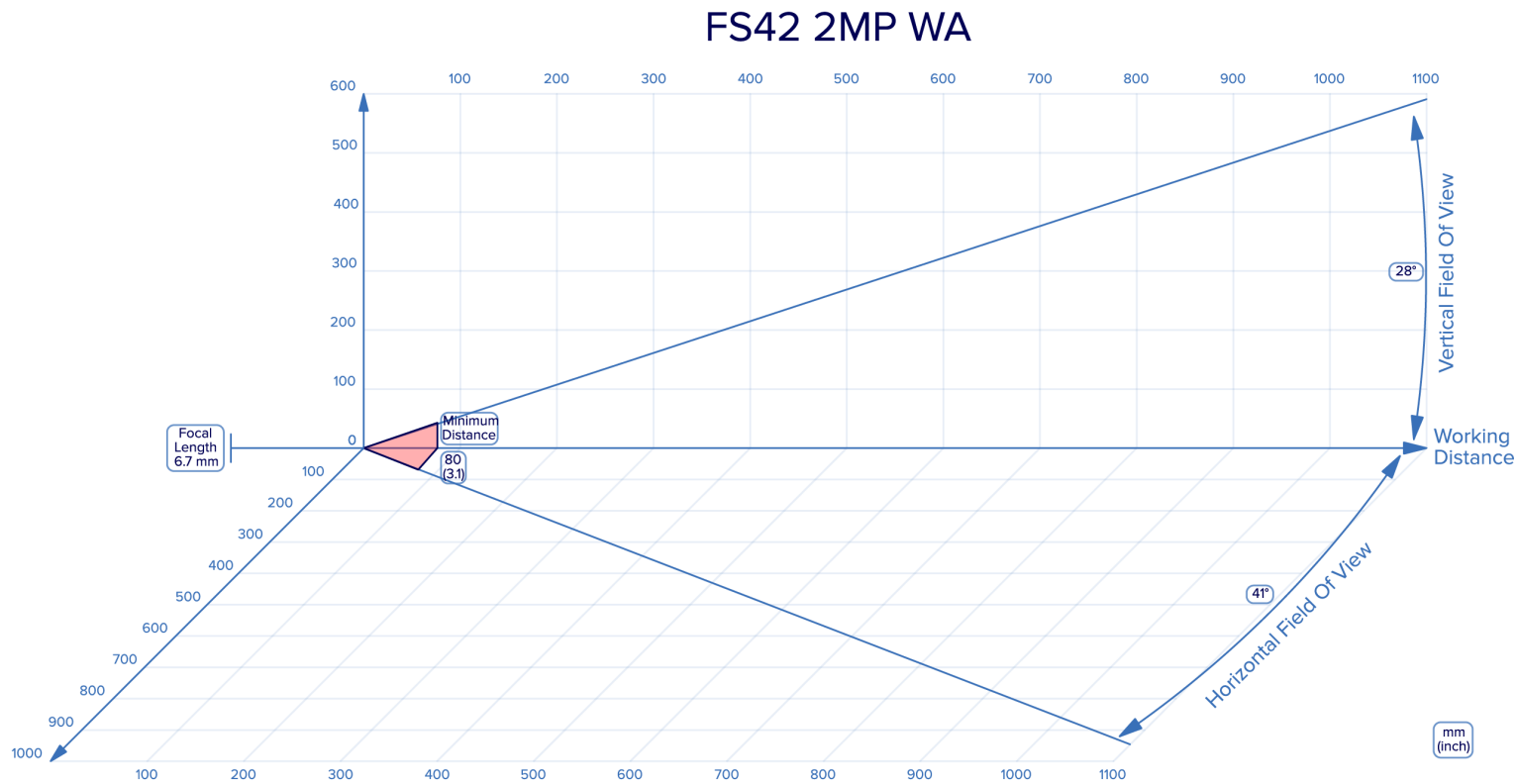
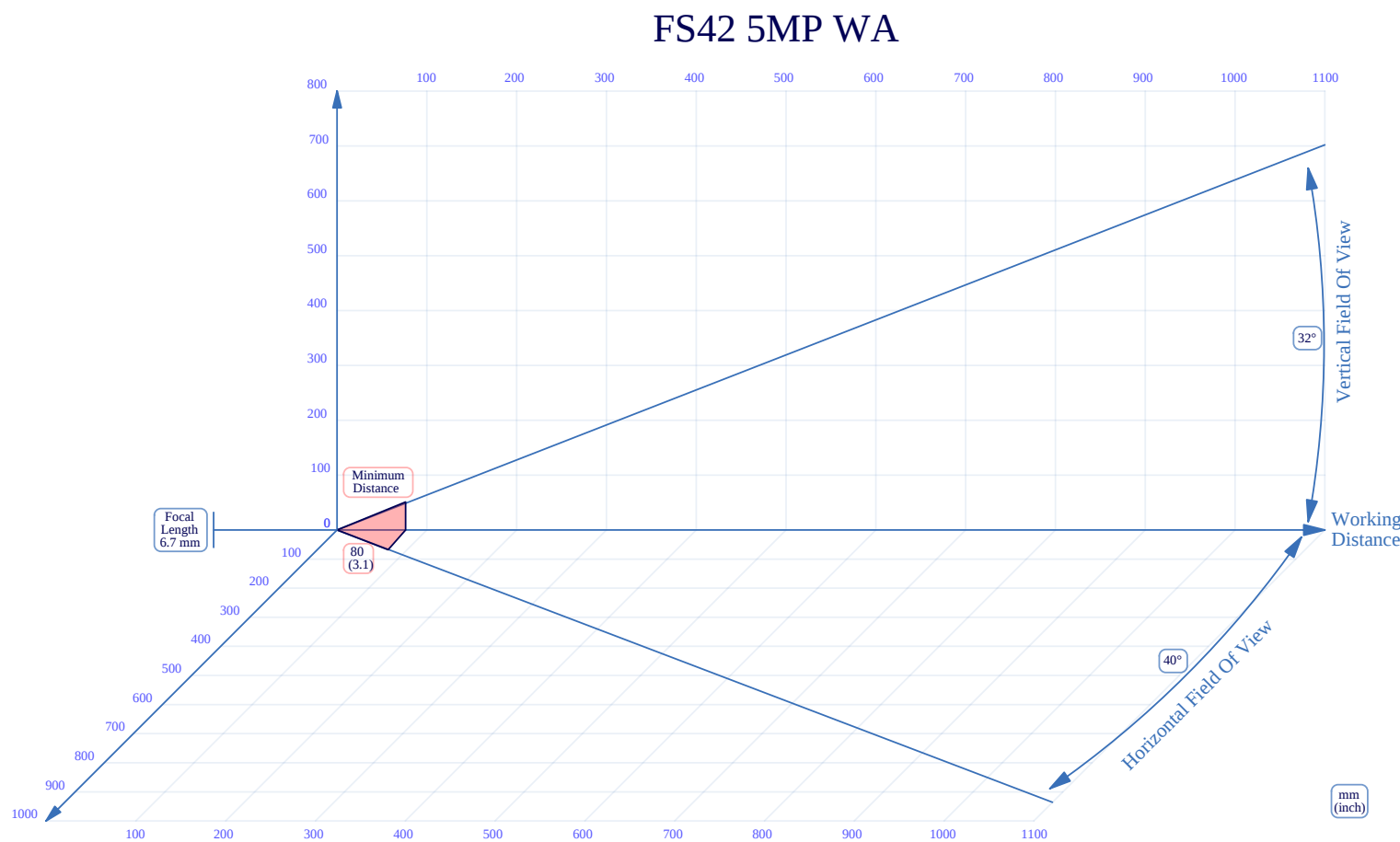


Figure 28 5MP Wide Angle



## Wide Angle - Code128

Figure 29 2MP Wide Angle - Code128

### FS42 2MP WA - Code128

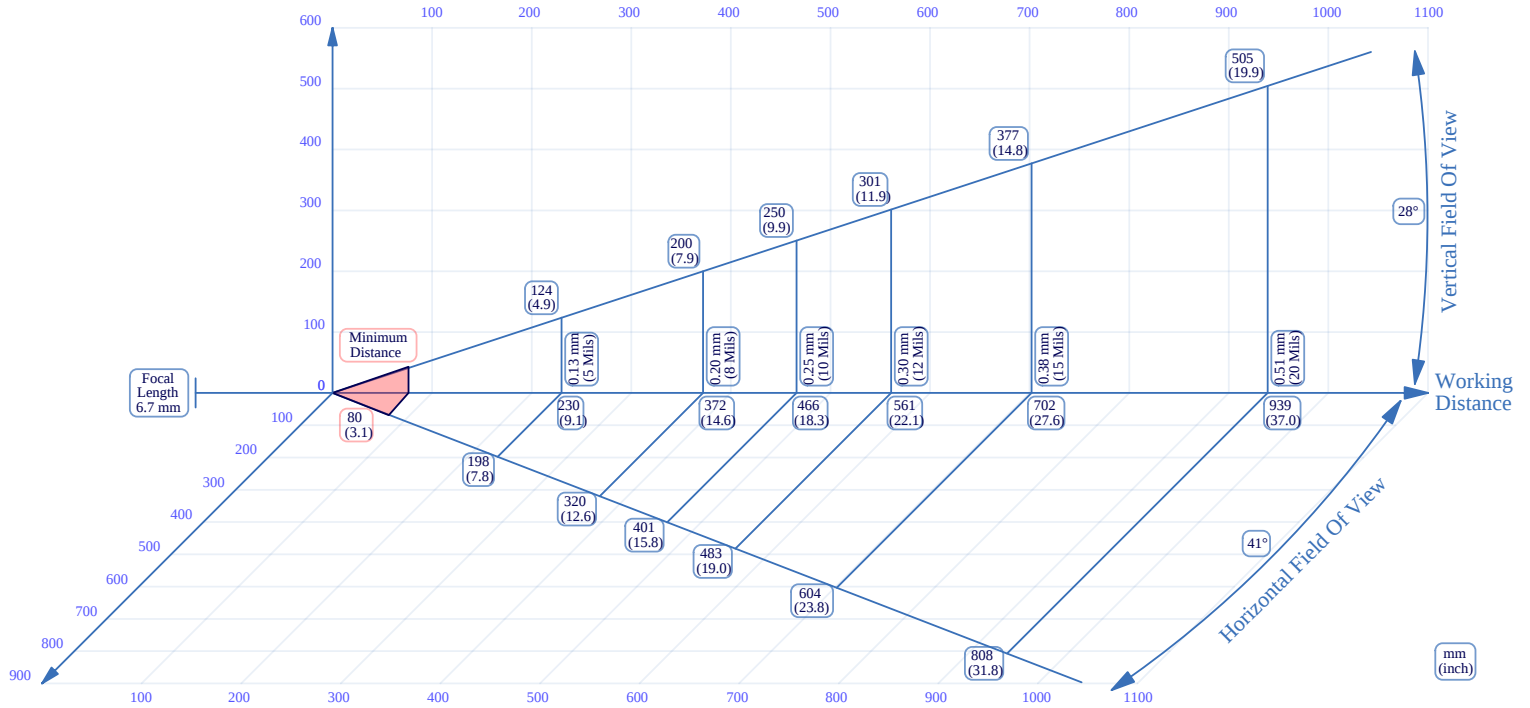
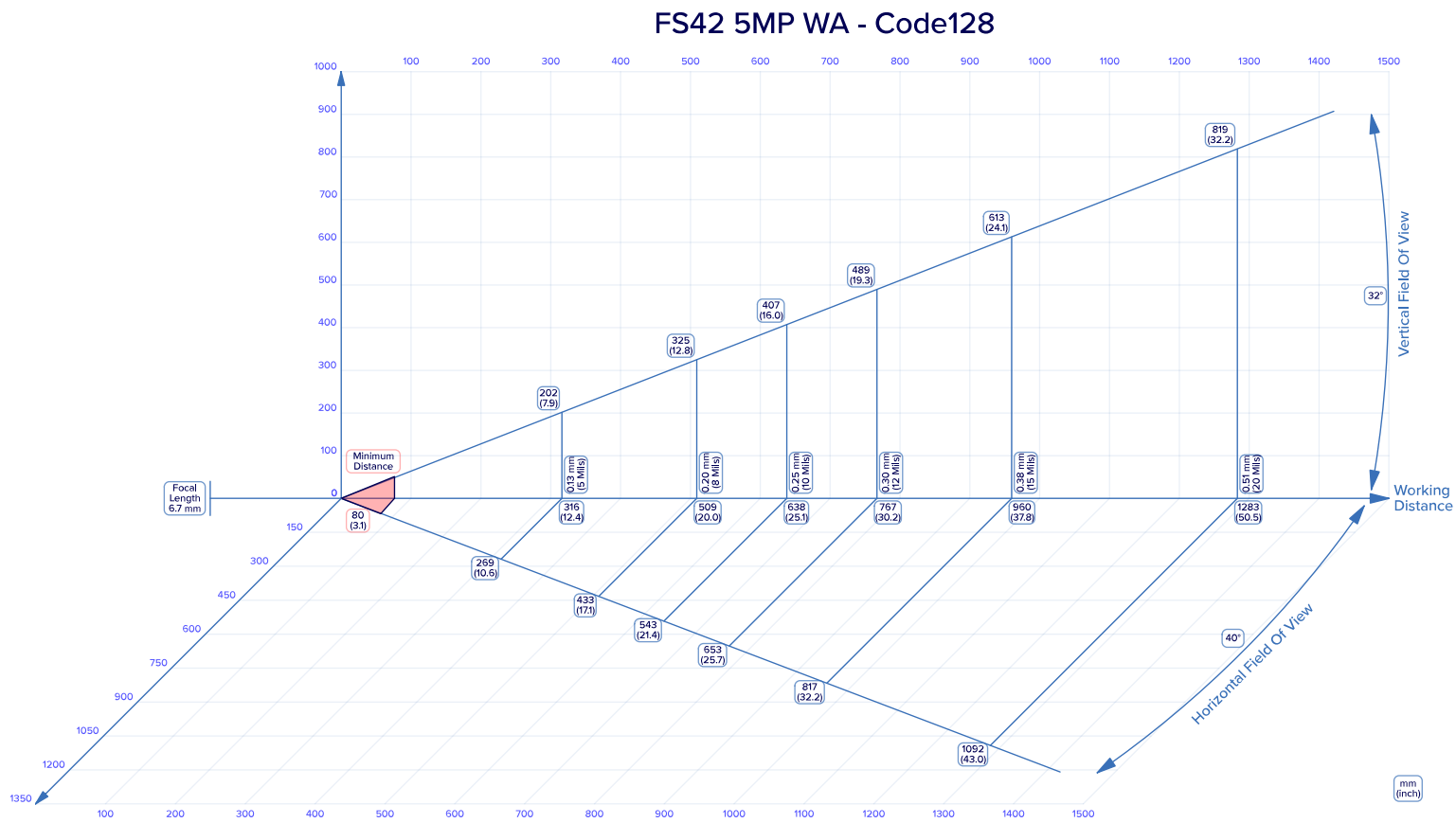


Figure 30 5MP Wide Angle - Code128



## Wide Angle - ECC 200

Figure 31 2MP Wide Angle - ECC 200

# FS42 2MP WA - ECC 200

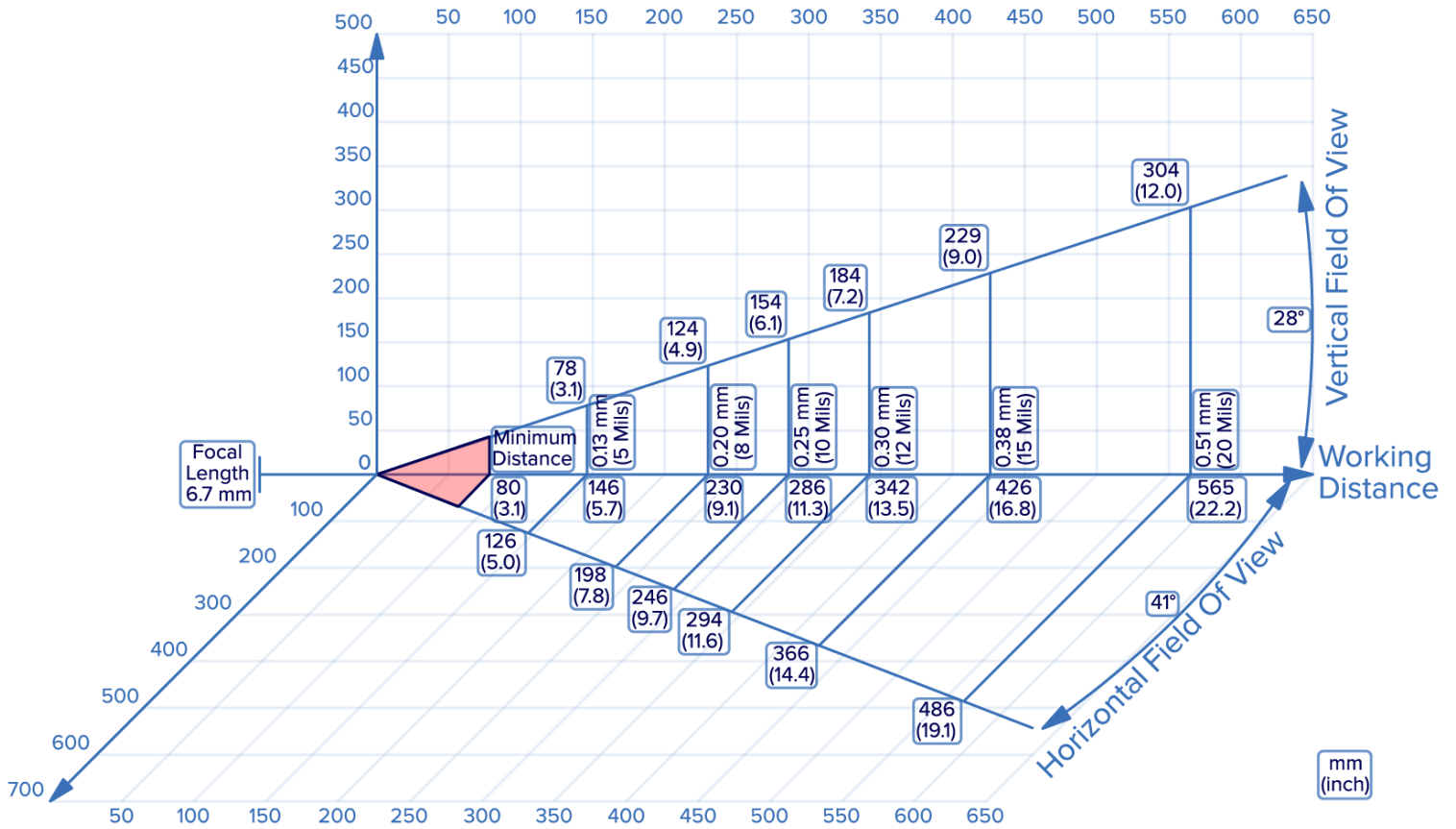
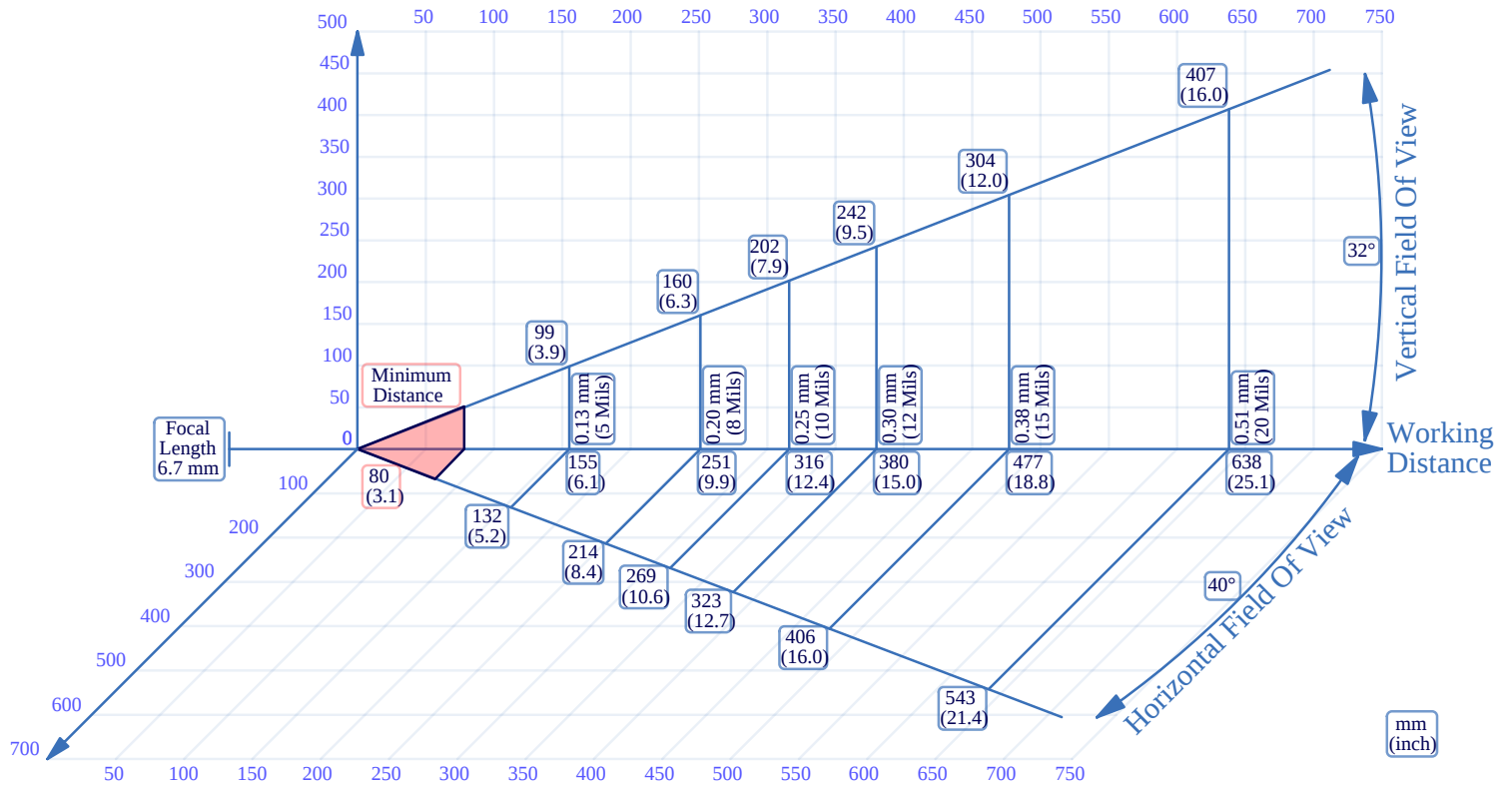


Figure 32 5MP Wide Angle - ECC 200

## FS42 5MP WA - ECC 200



# Maintenance

This section provides information on cleaning and maintaining the scanner.

## Known Harmful Ingredients

The following chemicals are known to damage the plastics on Zebra devices and should not come in contact with the device:

- Acetone
- Ammonia solutions
- Aqueous or alcoholic alkaline solutions
- Aromatic and chlorinated hydrocarbons
- Benzene
- Bleach
- Carboic acid
- Compounds of amines or ammonia
- Ethanolamine
- Ethers
- Ketones
- TB-lysoform
- Toluene
- Trichloroethylene

## Approved Cleaning Agents

The following cleaning agents are approved for cleaning the plastics on Zebra devices:

- Pre-moistened wipes
- Isopropyl alcohol 70%

## Tolerable Industrial Fluids and Chemicals

The following industrial fluids and chemicals were evaluated and deemed tolerable for Zebra devices.



**NOTE:** Not all fluid variants and brands have been tested.

- Motor/Engine Oil
- Automatic Transmission Fluid (ATF)
- Continuously Variable Transmission Fluid (CVT)
- Industrial De-Greaser (Engine Brite Heavy Duty)

## Cleaning the Device

Routinely cleaning the exit window is required. A dirty window may affect scanning accuracy. Do not allow any abrasive material to touch the window.

1. Dampen a soft cloth with one of the approved cleaning agents listed above, or use pre-moistened wipes.
2. Gently wipe all surfaces, including the front, back, sides, top, and bottom. Never apply the liquid directly to the device. Be careful not to let liquid pool around the scanner window, trigger, cable connector, or any other area on the device.
3. Clean the trigger area by carefully wiping the surface to prevent the label from lifting from the device.
4. Do not spray water or other cleaning liquids directly into the exit window.
5. Wipe the scanner exit window with lens tissue or other material suitable for cleaning optical material, such as eyeglasses.
6. Immediately dry the scanner window after cleaning with a soft, non-abrasive cloth to prevent streaking.
7. Allow the unit to air dry before use.
8. To clean the device connectors:
  - a. Dip the cotton portion of a cotton-tipped applicator in isopropyl alcohol.
  - b. Rub the cotton portion of the cotton-tipped applicator back and forth across the device's connector at least thrice, leaving no cotton residue.
  - c. Use the cotton-tipped applicator dipped in alcohol to remove grease and dirt near the connector area.
  - d. Do not leave any cotton residue on the connectors.

# Troubleshooting

This section describes potential issues that could arise while using the device and solutions to resolve them, such as power cycling and pinging the device.

**Table 20** Troubleshooting

| Problem                                                                  | Cause                                                                                           | Solution                                                                                                                   |
|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| The device is not connecting to the network when using Device Discovery. | Specific ports used by the application are blocked by Windows Defender Firewall.                | Ensure that Zebra Aurora Focus can access Domain, Public, and Private networks.                                            |
|                                                                          | Ensure the device is visible in Windows Network by opening File Explorer and selecting Network. | If the device is not viewable under the Network drop-down or listed under Other Devices, it is not connected.              |
|                                                                          | There is no RNDIS driver available to the device when connected via USB.                        | To verify that there is an RNDIS driver, go to the Windows Device Manager and search under the Network Adapters drop-down. |
| The device is cycling power or data connection on the USB port.          | The USB cable may be loose or intermittent.                                                     | Reseat the USB cable and tighten the locking screws firmly.                                                                |

## Device Discovery Troubleshooting Methods

Two common solutions to enable the device to re-connect via device discovery are performing a factory reset on the device and power cycling the device.

### Power Cycling the Device

Power cycling the device can help in troubleshooting potential network discoverability issues.

1. Remove all cables to ensure no power is being directed to the device.
2. Reinsert a power source and allow the device approximately one minute to boot up.
3. Re-attempt to:
  - Discover a device in Zebra Aurora Focus by restarting the application and clicking **View Devices**.
  - View a device in the Windows Network.

- Access a device using the Zebra Web HMI.

If failure persists, repeat the steps above for all of the connection types being used with the device, including:

- Ethernet directly to the PC.
- Ethernet connection to a network via switch or hub.

