

FS10/xS20 Smart Camera



ZEBRA

Product Reference Guide

2025/05/12

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About this Guide

This guide provides information on configurations, specifications, power sources, connectivity options, LED indicators, and maintenance guidelines for using the scanner.

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.

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 the user to know and that is not required to complete a task.



IMPORTANT: The text here indicates information that is important for the user to know.



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



WARNING: If danger is not avoided, the user CAN be seriously injured or killed.



DANGER: If danger is not avoided, the user WILL be seriously injured or killed.

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.

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.

Getting Started

This section provides information on device specifications, supported accessories, and compatible software license types.

Configurations

Fixed Industrial Scanning (FS) devices are equipped with a USB or PoE scanner with autofocus, while Vision System (VS) devices are equipped with a smart PoE Sensor with adjustable focus.

Table 1 Configurations

Device	Description
FS10	Fixed Industrial USB Scanner, Auto Focus, Standard Range, 1.0MP, Fast 2D Barcode Decoder, Red and White illumination
FS20	Fixed Industrial PoE Scanner, Auto Focus, Standard Range, 1.0MP, Ethernet with PoE, Serial and Industrial Protocols, Red or White Illumination
VS20	Smart PoE Sensor, Adjustable Focus, Standard Range, 1.0MP, Sensor Toolset with Fast 2D Decode, Ethernet with PoE, Serial and Industrial Protocols, Red or White Illumination



NOTE: FS10 devices with a loud beeper are available upon request.

License Types

The Zebra Web HMI refers to the License Name when describing license types that apply to FS/VS devices.

The following table outlines the available licenses and the corresponding License Name referenced in the Zebra Web HMI.

Table 2 License Types

License Type	Part Number	License Name
VS Sensor Package	LIC-SEN001-0100	xs-feature-vspkg:1.0
VS Standard Package	LIC-SEST01-0100	xs-feature-vspkg:2.0
FS DPM Full Package	LIC-DPM001-0200	xs-feature-fspkg:3.0

Table 2 License Types (Continued)

License Type	Part Number	License Name
FS Fast 1D/2D	LIC-2DF001-0200	xs-feature-fast1D2D:1.0
VS OCR	LIC-OCR002-0100	xs-feature-OCR02
FS OCR	LIC-OCR003-0100	xs-feature-OCR03
NS Anomaly Detection	LIC-AD002-0100	NSx2-feature-AD02
FS Anomaly Detection	LIC-AD003-0100	FSx2-feature-AD03
Gateway Connectivity License for FS10 devices	LIC-10LF-0000	xs-feature-deviceWISE03
Gateway Connectivity License for FS20 and VS20 devices	LIC-20LF-0000	xs-feature-deviceWISE04
Gateway Connectivity License for FS40, FS42, FS70, VS40, and VS70 devices	LIC-47LF-0000	xs-feature-deviceWISE05
Gateway Connectivity Full License for all devices in the FS and VS family	LIC-EXLF-0000	xs-feature-deviceWISE06



NOTE: Upgrades are available from a Sensor Toolset to a Standard Toolset and from an Fixed Scanning License to a Machine Vision License.

Accessories

Supported cables and power supplies for FS10 and xS20 devices are listed below.

Power Supplies

Both devices are compatible with 24VDC power supplies, PoE injectors are compatible with xS20 devices only.

Table 3 Supported Power Supplies

Part Number	Description
PWR-24V03A-0000	Power supply, 24VDC 3AMP, DIN rail mount
PWR-24V05A-0000	Power supply, 24VDC 5AMP, DIN rail mount
PWR-POE30W-0000	Power over Ethernet injector, 30W POE+, AC input (xS20 only)

Cables

FS10 devices utilize USB-C to C or USB-C to A cables, while xS20 devices utilize X-coded Ethernet and power, serial, and GPIO cables.

Table 4 Supported Cables

Device	Part Number	Description
FS10	CBL-USB00400-USC00	Cable, USB 4M, locking USB-C to USB C
	CBL-USB00200-USA00	Cable, USB 2M, locking USB-C to USB A
	CBL-USB00400-USA00	Cable, USB 4M, locking USB-C to USB A
	CBL-MATE-USA00	I/O Mating cable, DB-15 to USB-A and flying power leads
	CBL-ADPTR-USC00	I/O Adaptor cable, USB-C to DB-15
xS20	CBL-ENT00500-M1200	Cable, Ethernet 5M, X-Coded M12 to RJ45, standard flex
	CBL-ENT01500-M1200	Cable, Ethernet 15M, X-Coded M12 to RJ45, standard flex
	CBL-PWR00500-M1200	Cable, power 5M, 12 Pin M12 to flying leads, standard flex
	CBL-PWR01500-M1200	Cable, power 15M, 12 Pin M12 to flying leads, standard flex

Specifications

The following table outlines the physical characteristics, performance characteristics, user environment, and regulatory approvals of FS10 and xS20 devices.

FS10 Specifications

The following table lists the physical characteristics, user environment, and regulatory specifications of the FS10.

Specification	Description
Physical Characteristics	
Dimensions	1.0 in. H x 2.0 in. W x 1.92" D 25.4 mm H x 50.8 mm W x 48.9mm D
Weight	110 g/3.9 oz
Power	USB Type-C, 1A max
Communication Protocols	USB RNDIS, HID, CDC
Interface Ports	(1) USB Type C supports USB 2.0 high speed only
Performance Characteristics	
Image Sensor	Monochrome: 1.0 MP (1280x800 pixels) CMOS Sensor with Global Shutter and 3.0 um pixel size
Acquisition Rate	60 frames/second
Aimer	617nm Red LED aim dot

Specification	Description
Illumination	(1) 2700K (Color Temperature) White LED (1) 660nm Red LED
Imager Field of View	35°(H) x 26°(V)
User Environment	
Operating Temperature	0°C to 45°C (32°F to 113°F) (duty cycle-dependent)
Storage Temperature	-40° to 70°C (-40°F to 158°F)
Humidity	5 % to 90 % RH (Non-Condensing)
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
Sealing	IP65 and IP67
Light Immunity	Product operates in: Incandescent 450 ft candles, Sunlight <6000 ft candles, Florescent 450 ft candles, Mercury Vapor 450 ft candles, Sodium Vapor 450 ft candles, LED 450 ft candles
Electrostatic Discharge	±15KV Air, ±8KV Direct/Indirect Contact
Regulatory Approvals	
Environmental	EN 50581:2012 EN IEC 63000:2018
Electric Safety	IEC 62368-1 (Ed.2) EN 62368-1:2014/A11:2017
EMI/EMS	EN 55032:2015/A11: 2020 EN 55035:2017/A11: 2020 EN 61000-3-2: 2014 EN 61000-3-3: 2013 EN 61000-6-2: 2005 & 2019 FCC 47 CFR Part 15, Subpart B Canada ICES-003, Issue 7
EU Declaration of Conformity	2014/30/EU; 2014/35/EU; 2011/65/EU Refer to the Declaration of Conformity (DoC) for details of compliance with the current standards. The DoC is available at: zebra.com/doc

xS20 Specifications

The following table lists the physical characteristics, user environment, and regulatory specifications of the xS10.

Specification	Description
Physical Characteristics	

Specification	Description
Dimensions	1.0 in. H x 2.0 in. W x 1.92" D 25.4 mm H x 50.8 mm W x 48.9mm D
Weight	110 g/3.9 oz
Power	USB Type-C, 1A max
Communication Protocols	USB RNDIS, HID, CDC
Interface Ports	(1) USB Type C supports USB 2.0 high speed only
Performance Characteristics	
Image Sensor	Monochrome: 1.0 MP (1280x800 pixels) CMOS Sensor with Global Shutter and 3.0 um pixel size
Acquisition Rate	60 frames/second
Aimer	617nm Red LED aim dot
Illumination	(1) 2700K (Color Temperature) White LED (1) 660nm Red LED
Imager Field of View	35°(H) x 26°(V)
User Environment	
Operating Temperature	0°C to 45°C (32°F to 113°F) (duty cycle-dependent)
Storage Temperature	-40° to 70°C (-40°F to 158°F)
Humidity	5 % to 90 % RH (Non-Condensing)
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
Sealing	IP65 and IP67
Light Immunity	Product operates in: Incandescent 450 ft candles, Sunlight <6000 ft candles, Florescent 450 ft candles, Mercury Vapor 450 ft candles, Sodium Vapor 450 ft candles, LED 450 ft candles
Electrostatic Discharge	±15KV Air, ±8KV Direct/Indirect Contact
Regulatory Approvals	
Environmental	EN 50581:2012 EN IEC 63000:2018
Electric Safety	IEC 62368-1 (Ed.2) EN 62368-1:2014/A11:2017

Specification	Description
EMI/EMS	EN 55032:2015/A11: 2020 EN 55035:2017/A11: 2020 EN 61000-3-2: 2014 EN 61000-3-3: 2013 EN 61000-6-2: 2005 & 2019 FCC 47 CFR Part 15, Subpart B Canada ICES-003, Issue 7
EU Declaration of Conformity	2014/30/EU; 2014/35/EU; 2011/65/EU Refer to the Declaration of Conformity (DoC) for details of compliance with the current standards. The DoC is available at: zebra.com/doc

Installation

If you are using the scanner in a deployment environment, fasten it to a support structure using its provided mounting holes. View the dimensional drawings to understand how to mount the scanner.

FS10 Drawings

Figure 1 FS10 Dimensional Drawings

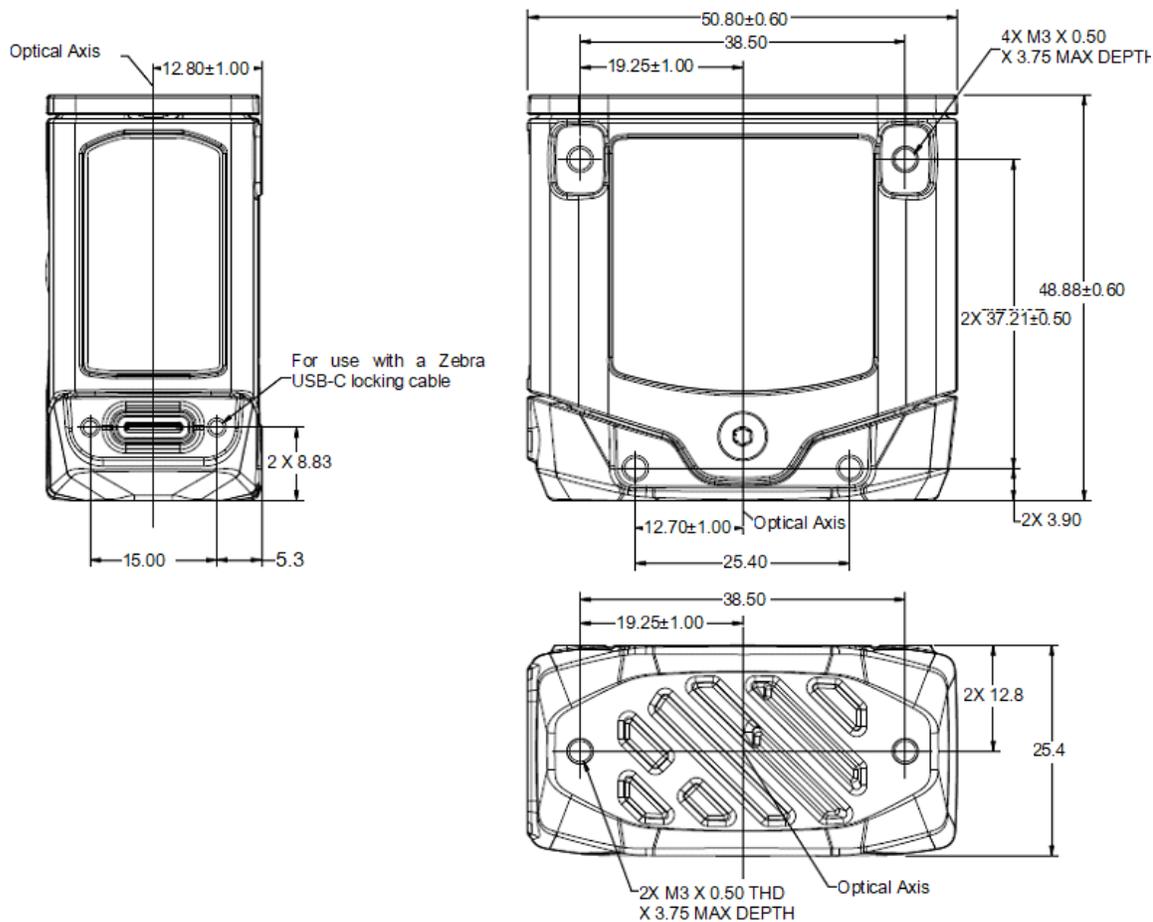
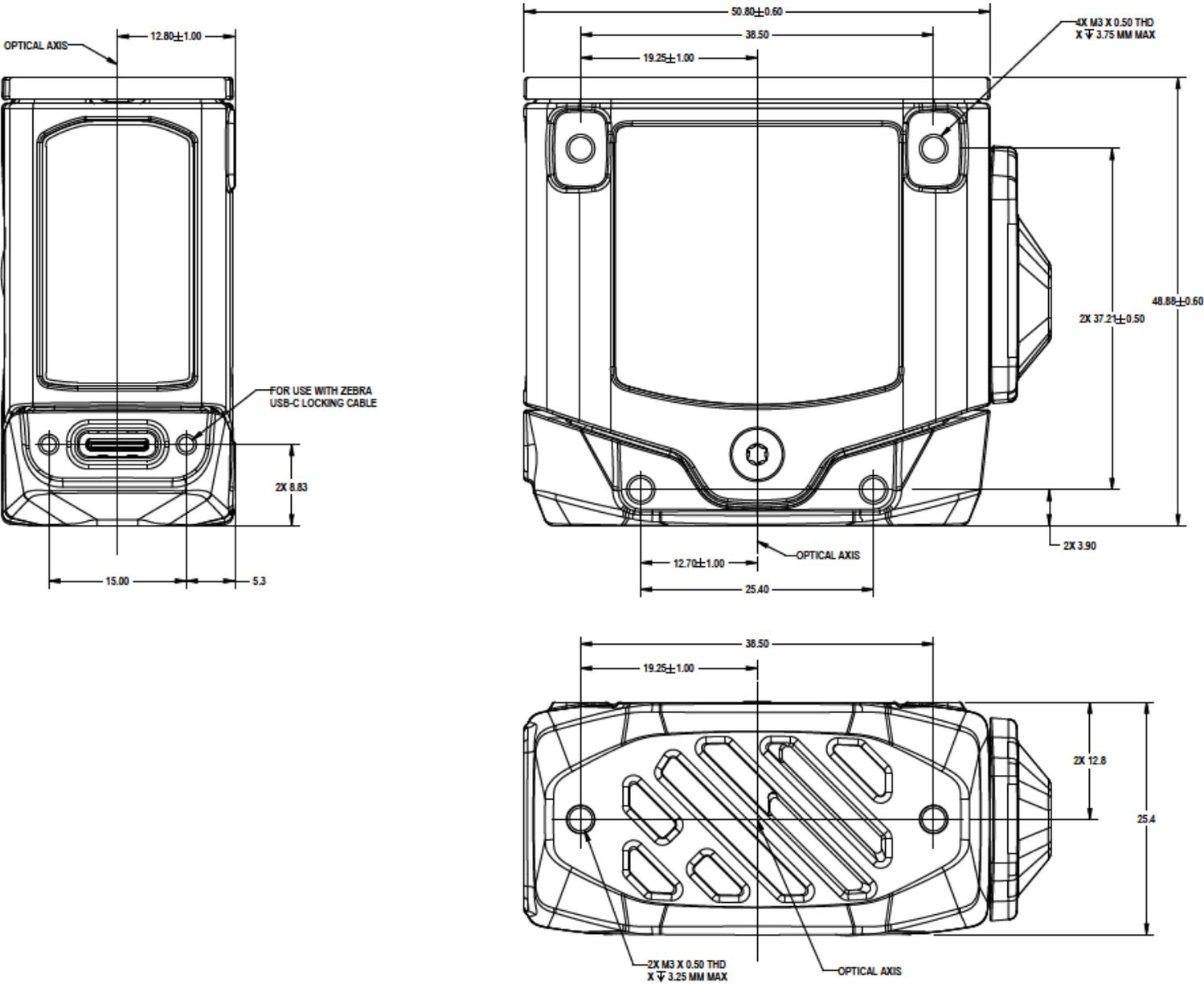
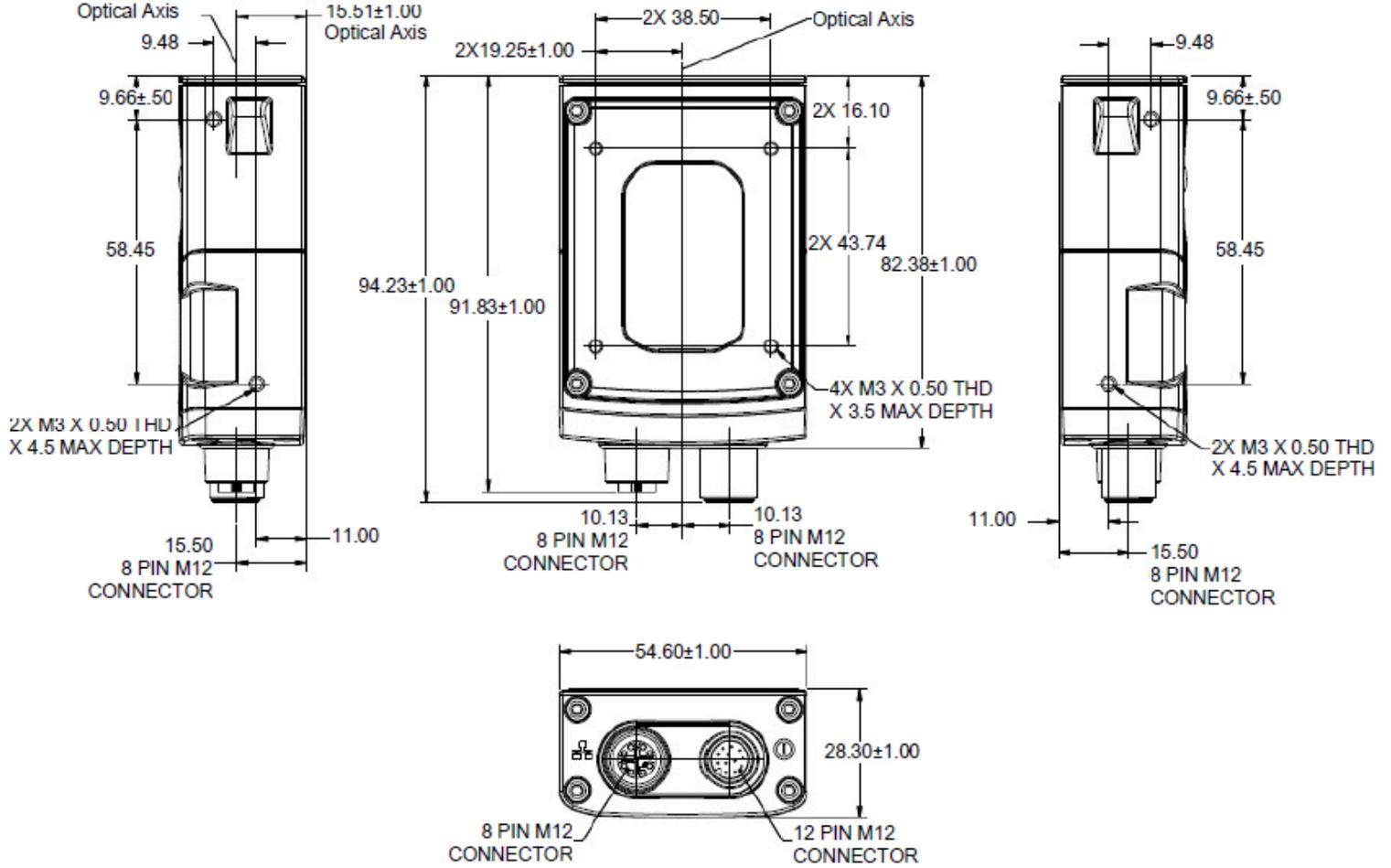


Figure 2 FS10 Loud Beeper Dimensional Drawings



xS20 Dimensional Drawings

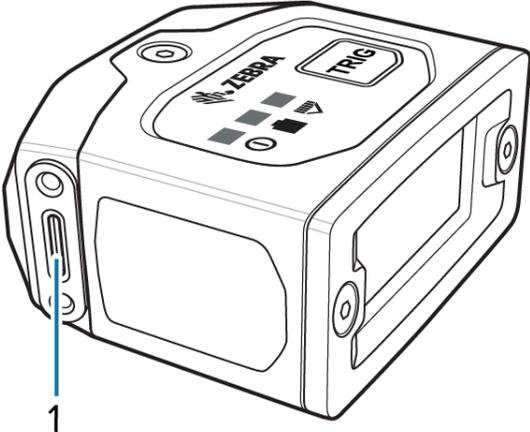
Figure 3 xS20 Dimensional Drawings



Device Connections

The FS10 supports USB-C connections (USB 2.0 high speed only).

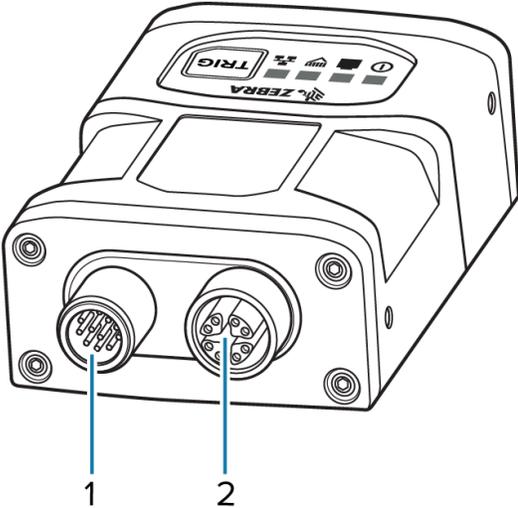
Figure 4 FS10 Connection



1	USB-C
---	-------

The xS20 supports power, serial, GPIO, and Ethernet.

Figure 5 xS20 Connections



1	Power, Serial, and GPIO
2	X-Coded Ethernet

Power Sources

FS/VS Smart Camera devices are powered through an external power supply, Power over Ethernet (PoE) (xS20 only), or USB Type C (FS10 only) for maximum flexibility. A power priority scheme selects power from the external power supply over PoE (xS20 only) and USB host power (FS10 with adaptor cable only) to ensure the least restrictive power source is utilized. Changes to the power source may trigger a reboot.

12 Pin M12 Power Input

This power source input powers the xS20 only. No external peripherals are powered through the xS20. As a result, as long as the voltage and current are met in the specification table, the xS20 operates as expected. Circuitry in the xS20 prevents input current overload of the M12 connector and protects from reverse voltage and over and under voltage exceeding the input specifications.

Power Over Ethernet

The xS20 requires a minimum 802.3af Class 2 (7W) PoE power source to operate properly.

USB Type C Operation

The FS10 utilizes a USB type C connection that supports USB 2.0 high speed communication only. 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.



CAUTION: The sealing gasket on IP67 series Zebra USB Type C cables require adequate pressure for proper seal 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
- HID keyboard

Adapter Cable

The adapter and mating cables provide opto-coupled GPIO capability to the FS10. The FS10 is powered by the external power supply connected to the flying leads, and the adapter cable provides 5V regulation.

The FS10 does not turn on until the USB portion of the mating cable is plugged into a USB host to ensure that the FS10 enumerates on the USB bus properly. Circuitry in the adapter cable provides protection from reverse voltage and over and under voltage exceeding the input specifications.

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

The following sections outline the pinouts for the 12-pin Power and I/O connector and the Ethernet connector for xS20 devices.

Power and IO Connector

Figure 6 Power and I/O Connector - 12 Pin Listing

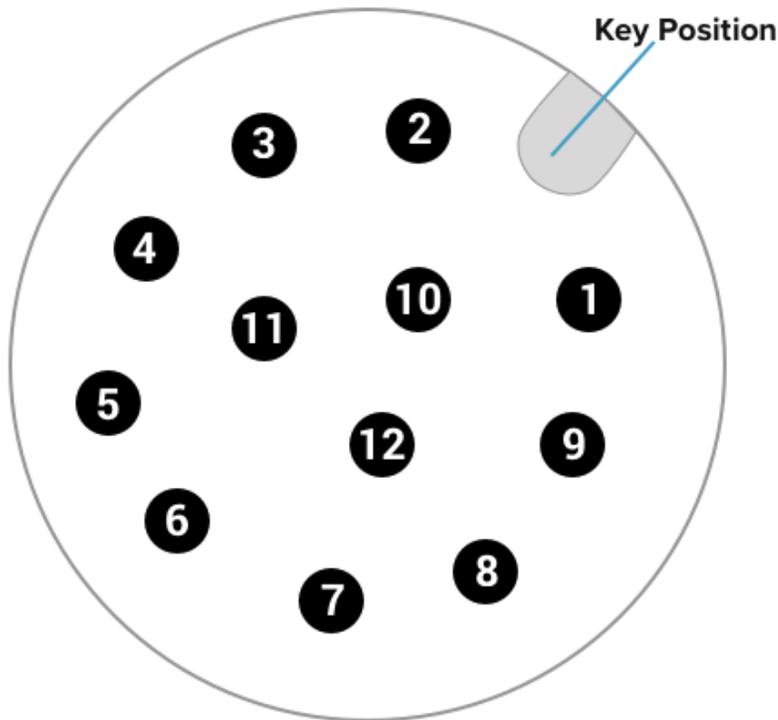


Table 5 Power and I/O Connector - 12 Pin Listing

Pin	Color	Description
1	Yellow	OUT1
2	White/Yellow	TXD
3	Brown	RXD
4	White/Brown	IN1
5	Violet	RTS

Table 5 Power and I/O Connector - 12 Pin Listing (Continued)

Pin	Color	Description
6	White/Violet	COMMON_IN
7	Red	DC_IN
8	Black	GND
9	Green	COMMON_OUT
10	Orange	IN0
11	Blue	OUT0
12	Grey	CTS
SHELL	Bare	SHIELD

Flying Lead Adaptor Cable

FS10 devices support the use of flying lead adaptor cables. View the table in this section to understand the wire colors and supported signals.

Figure 7 Flying Leads Adaptor Cable (FS10 Only)

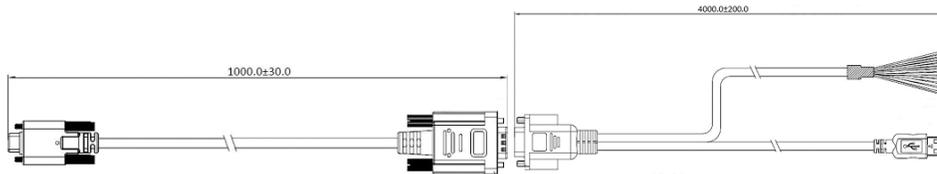


Table 6 Flying Leads Adaptor Cable (FS10 Only)

Wire Color	Description
Yellow	OUT1
White/Brown	IN1
White/Violet	COMMON_IN
Red	DC_IN
Blank	GND
Green	COMMON_OUT
Orange	IN0
Blue	OUT0
Bare	SHIELD

Ethernet Connector

Figure 8 8 Pin Ethernet Connector Diagram

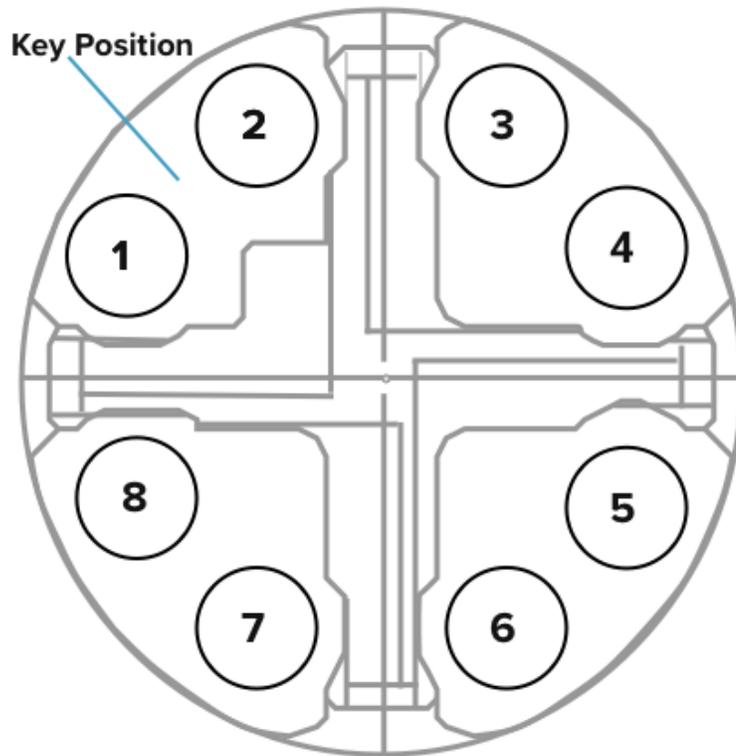


Table 7 8-Pin Ethernet Connector Pin Out Description

Pin	
1	ENET_MX1P
2	ENET_MX1N
3	ENET_MX2P
4	ENET_MX2N
5	ENET_MX4P
6	ENET_MX4N
7	ENET_MX3N
8	ENET_MX3P
SHELL	SHIELD

Setting Up the Device

This section provides mounting instructions using an L-bracket

Mounting Instructions

1. Refer to the dimensional drawings for mounting hole placements on the device.
2. Align the holes on the mounting surface with the mounting holes on the device.
3. Insert screws into the mounting holes and tighten. The recommended torque is 6.0 in-lbs.

Torque Specification

Each connector requires a specific torque value.

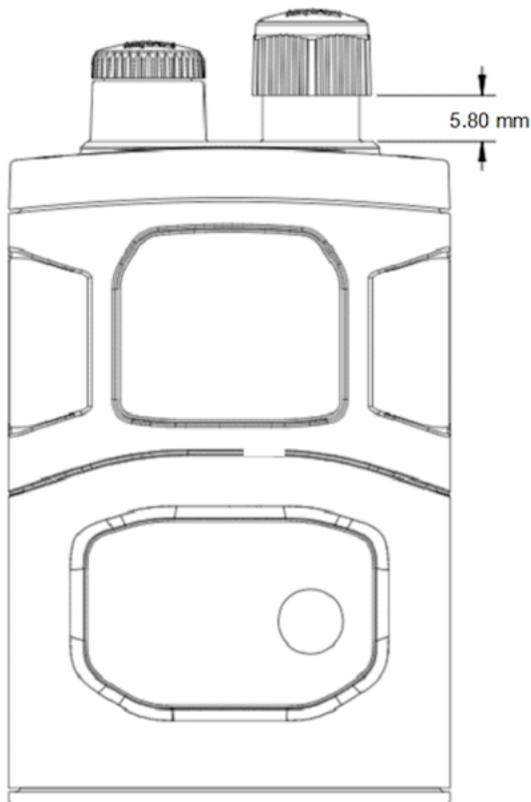
To guarantee an IP65 or IP67 product specification, Zebra cables or connector covers must be torqued to the following specifications:

- Torque for M12 Zebra cables (xS20 only): 24.0 in-lbs
- Torque for USB-C cables (FS10 only): 1 in-lb
- Torque for connector covers (xS20 only): 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 or IP67 specification if cables are not used.

To ensure proper connector cover seating, refer to the following diagram for the reference dimension (5.80 mm) of the connector covers.



Using the Device

This section includes information on data capture, LED and beeper feedback, and power and thermal management strategies to ensure efficient operation.

USB Type C Operation

The FS10 utilizes a USB type C connection that supports USB 2.0 high speed communication only. 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.



CAUTION: The sealing gasket on IP67 series Zebra USB Type C cables require adequate pressure for proper seal 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
- HID keyboard

Data Capture

The FS10/xS20 Smart Cameras have an amber LED aiming dot.

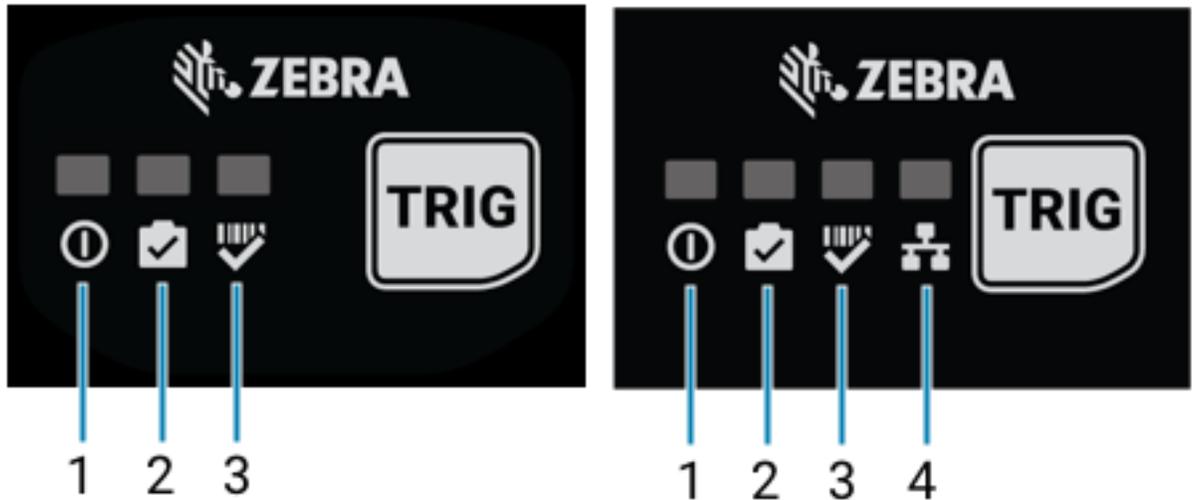
Figure 9 FS10/xS20 Aiming Dot



User Interface Label

The User Interface (UI) label uses LEDs to provide information on device state and feedback. The sensor PCB switch controls the device's trigger buttons, and the TRIG switch on the device acts as a trigger.

Figure 10 FS10 and xS20 UI Labels



1	Power	1	Power
2	Device Status	2	Device Status
3	Decode	3	Decode
		4	Ethernet

LED and Beeper Indications

The following table describes the device's LED and beeper indications during power-up, maintenance operations, and decoding events.

Table 8 LED and Beeper Indications

Event	Beeper	Power LED	Device Status LED	Decode LED	Ethernet (xS20)
Power Up					
Power up with Low Power	 Low, Medium, High Tone	 Solid Red	-	-	

Table 8 LED and Beeper Indications (Continued)

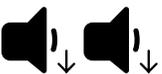
Event	Beeper	Power LED	Device Status LED	Decode LED	Ethernet (xS20)
Power up with Limited Power (USB or 15W PoE)	 Low, Medium, High Tone	 Green (Slow Blink)	-	-	
Power up with Full Power (24V or 30W PoE)	 Low, Medium, High Tone	 Solid Green	-	-	
Job Error	 Low, Low Tone	 Solid Green	 Solid Red	-	
Device Maintenance					
Factory Reset	 Medium, Medium Tone	 Solid Green	-	-	
Firmware Operations					
Firmware Update Start	-	 Solid Green	 Continuous Red Flash (2hz)	-	
Firmware Update Success	-	 Solid Green	-	-	
Firmware Update Fail	 Low Tone	 Solid Green	 Continuous Red Flash (5hz)	-	
Autotune Operations					

Table 8 LED and Beeper Indications (Continued)

Event	Beeper	Power LED	Device Status LED	Decode LED	Ethernet (xS20)
AutoTune Start	 Medium Tone	 Solid Green	-	 Continuous Green (2Hz)	
AutoTune Success	 High Tone	 Solid Green	-	 Solid Green	
AutoTune Fail	 Low Tone	 Solid Green	-	 Solid Red	
Decode					
Barcode Decode Start	-	 Solid Green	 Solid Amber	-	
Barcode Decode Success	 Medium Tone	 Solid Green	-	-	
Barcode Decode Failure	-	 Solid Green	-	-	
Parameter Programming					
Parameter Entry Accepted	 High, Low, High, Low Tone	-	 Solid Green	-	
Parameter Number Entry Expecting Barcodes	 High, Low Tone	-	 Solid Green	-	

Table 8 LED and Beeper Indications (Continued)

Event	Beeper	Power LED	Device Status LED	Decode LED	Ethernet (xS20)
Parameter Entry Error	 Low, High Tone	-	 Solid Green	-	

Decode Ranges

The following table provides typical near and far decode ranges for reading Code 128 and Data Matrix barcodes.

Table 9 FS10 and xS20 Decode Ranges

Symbology	Typical Near	Typical Far
5 mil Code 128	51 mm (2 in.)	330 mm (13 in.)
10 mil Code 128	51 mm (2 in.)	656 mm (25 in.)
15 mil Code 128	51 mm (2 in.)	940 mm (37 in.)
20 mil Code 128	51 mm (2 in.)	1219 mm (48 in.)
5 mil Data Matrix	51 mm (2 in.)	203 mm (8 in.)
10 mil Data Matrix	51 mm (2 in.)	381 mm (15 in.)
15 mil Data Matrix	51 mm (2 in.)	610 mm (24 in.)
30 mil Data Matrix	51 mm (2 in.)	1143 mm (45 in.)



NOTE: Near distance is limited by barcode width, and near distance focuses no closer than 3". May be limited by illumination output.

Reading Diagrams

The following diagrams provide reading distances based on ECC 200 and Code128 barcode reads.

Reading Distances

Figure 11 FS10/xS20 Reading Distances

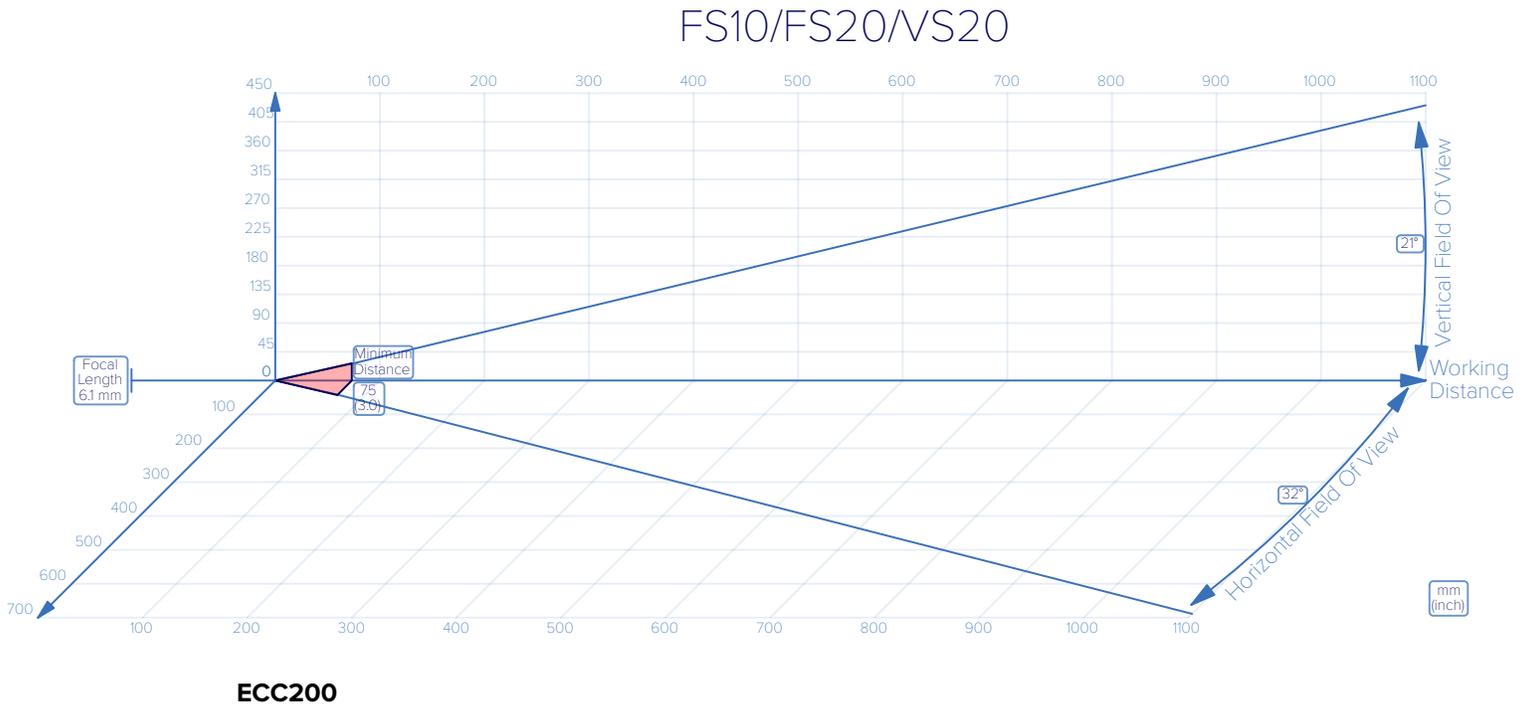


Figure 12 FS10/xS20 Reading Distances - ECC 200

FS10/FS20/VS20 - ECC 200

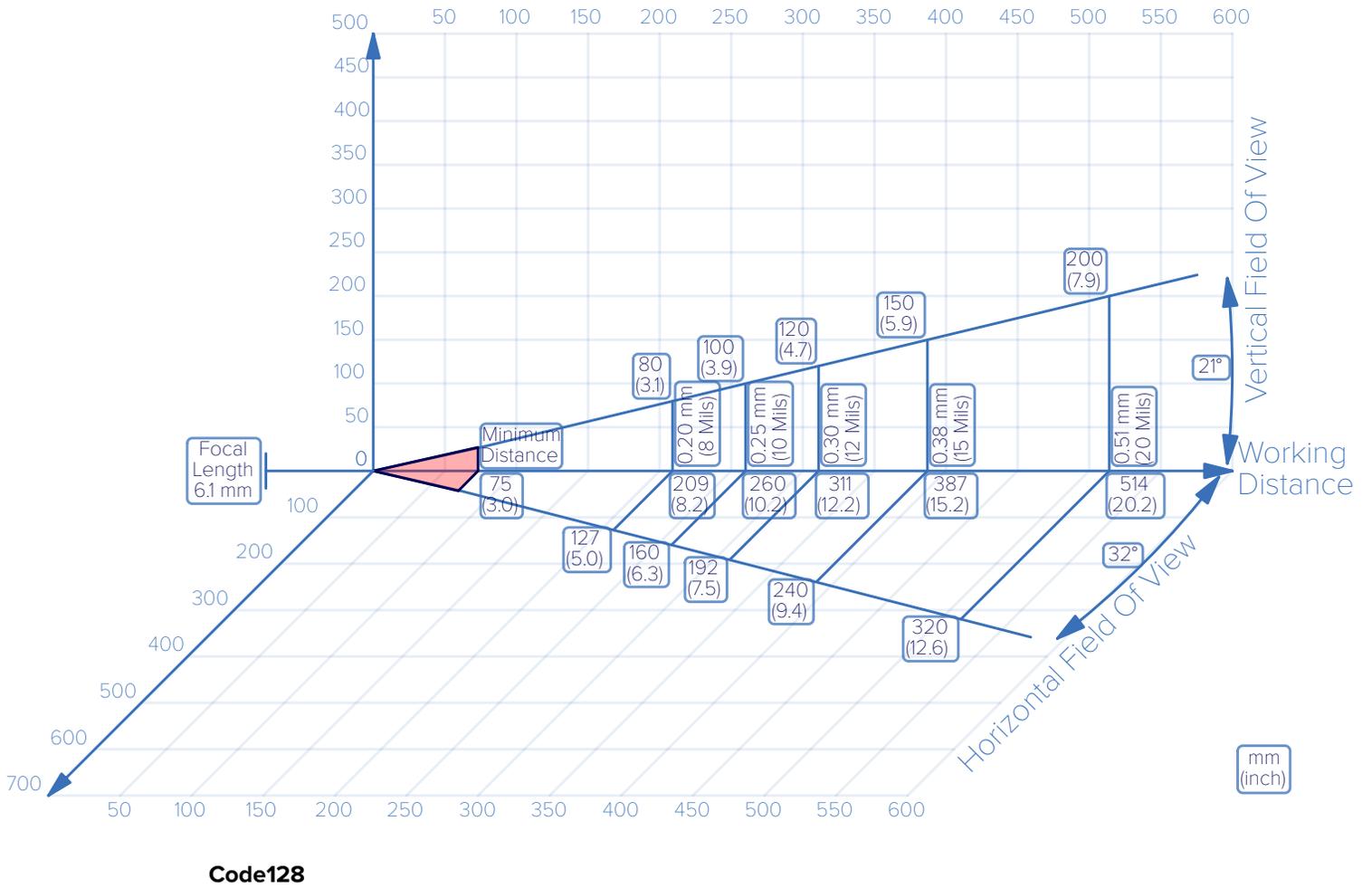
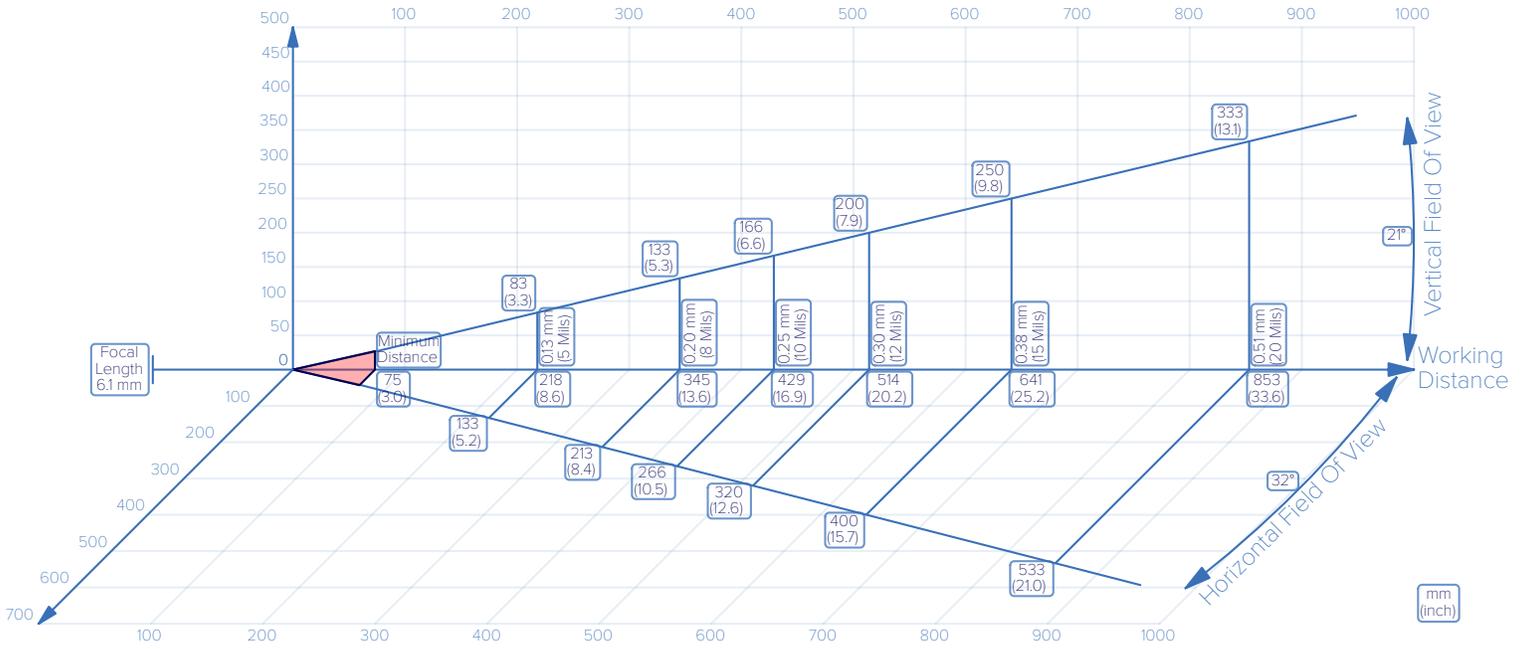


Figure 13 FS10/xS20 Reading Distances - Code128

FS10/FS20/VS20 - Code128



General Purpose Input and Outputs

The FS10 (with appropriate cable) and xS20 devices have two dedicated input and two dedicated output general purpose IO. They are all optically coupled to provide electrical isolation and wiring flexibility.

Figure 14 Opto-Isolated Inputs

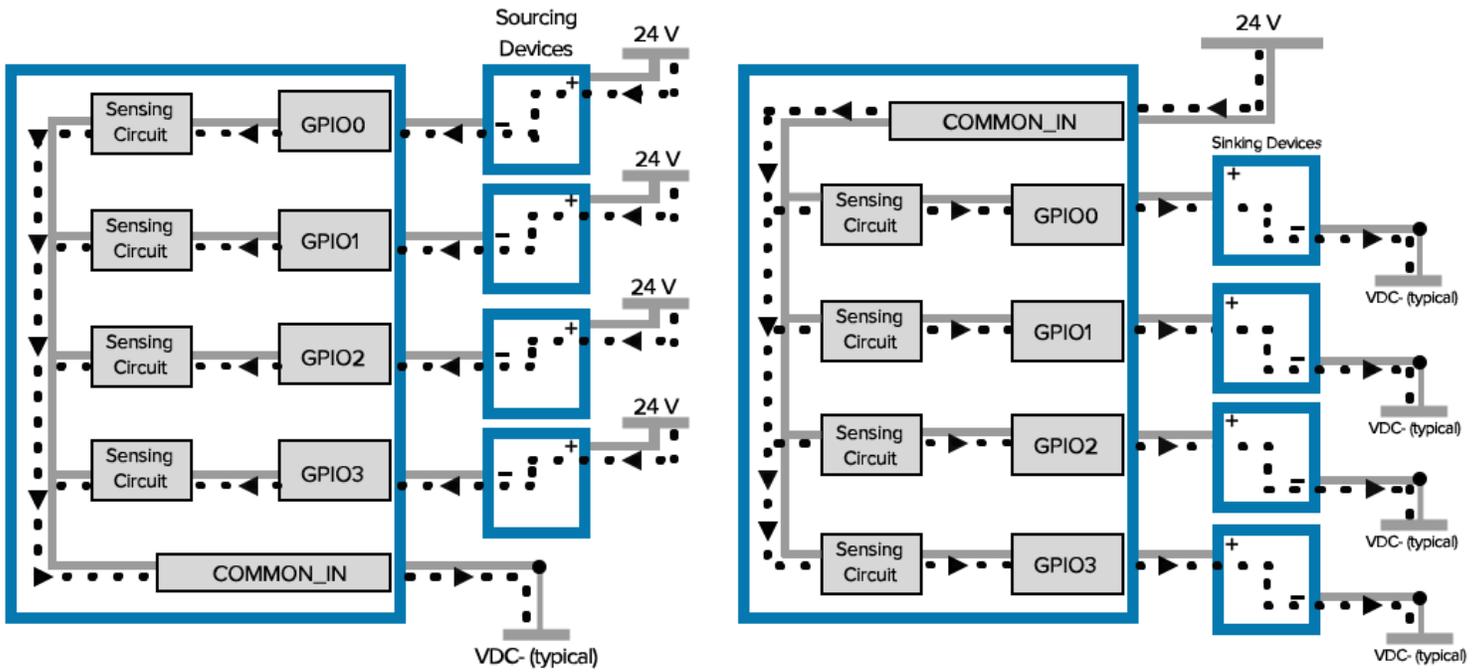
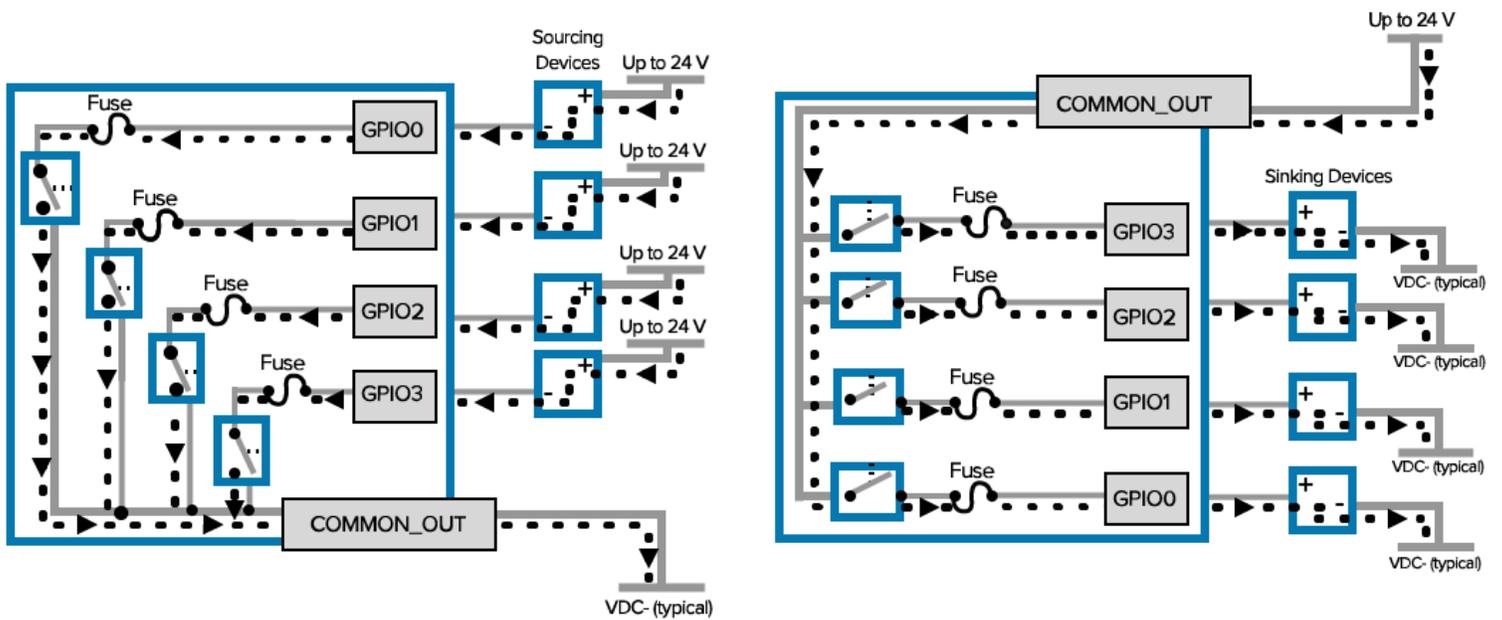


Figure 15 Opto-Isolated Outputs



GPIO Summary

The following table provides GPIO details such as connector, input mode, and output mode.

Table 10 FS10 I/O Summary

IO	Hardware	DB15 Pin	Color	Isolated	Sink PNP	Source NPN	Current
Input 0	Opto	4	Orange	Yes	Yes	Yes	¹ 10mA
Input 1	Opto	14	White/ Brown	Yes	Yes	Yes	¹ 10mA
Output 0	Opto	5	Blue	Yes	Yes	Yes	100mA
Output 1	Opto	15	Yellow	Yes	Yes	Yes	100mA
Com_IN	-	9	White/ Purple	Yes	Yes	Yes	-
Com_Out	-	10	Green	Yes	Yes	Yes	-



NOTE: The FS10 IOs are accessible from the USB-C to DB15 adaptor cable (CBL-ADPTR-USC00) and the DB-15 to USB-A and flying leads mating cable (CBL-MATE-USA00).

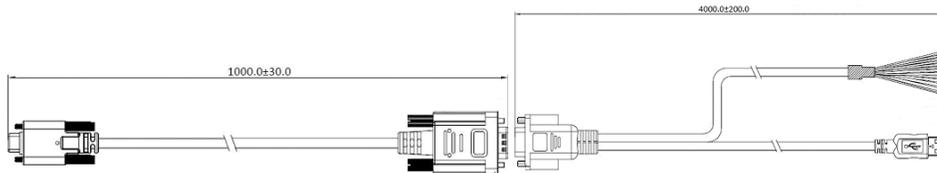


Table 11 xS20 I/O Summary

IO	Hardware	DB15 Pin	Color	Isolated	Sink PNP	Source NPN	Current
Input 0	Opto	10	Orange	Yes	Yes	Yes	¹ 10mA
Input 1	Opto	4	White/ Brown	Yes	Yes	Yes	¹ 10mA
Output 0	Opto	11	Blue	Yes	Yes	Yes	100mA
Output 1	Opto	1	Yellow	Yes	Yes	Yes	100mA
Com_IN	-	6	White/ Violet	Yes	Yes	Yes	-
Com_Out	-	9	Green	Yes	Yes	Yes	-



NOTE: ¹Digital outputs consume power and reduce the power budget available for illumination. It is recommended to disable unused output when using PoE.



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

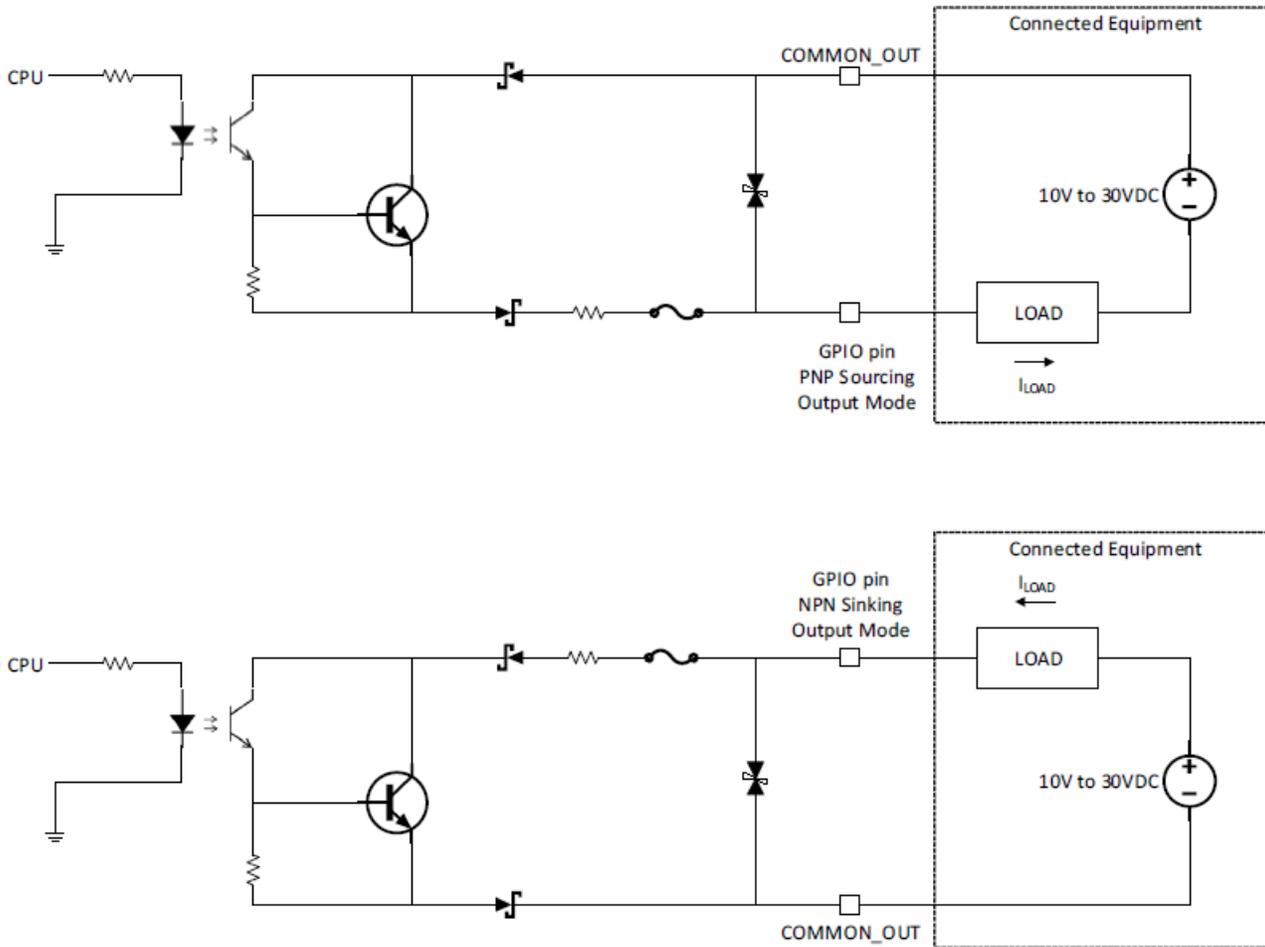
Optically Coupled GPIO

Optocoupled GPIO have the advantage of being electrically isolated from the rest of the vision 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 (also known as NPN) type or Sourcing (also known as PNP) type.

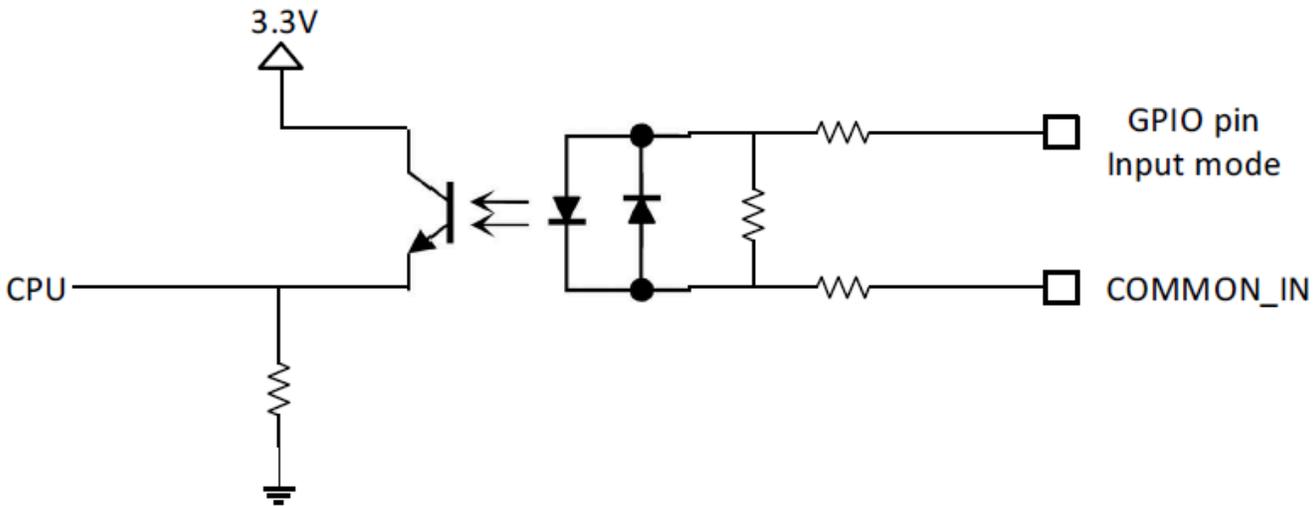
The output GPIO performs similarly to switches connecting the GPIO pin to COMMON_OUT. When disabled, the GPIO pin is disconnected from COMMON_OUT and allowed to float. As a result, optocoupled outputs turn on relatively quickly, while the turn off time is dependent upon how quickly the connected load dissipates charge.

Figure 16 Output Mode Equivalent Circuit Diagram for NPN and PNP Mode



Optocoupled inputs are enabled when voltage is applied across the GPIO pin and COMMON_IN.

Figure 17 Input Mode Equivalent Circuit Diagram for NPN and PNP Mode



Optocoupled GPIO can be operated in a non-isolated fashion by terminating COMMON_IN and COMMON_OUT to the DC_IN or GND wires used to power the device.

The following table provides a useful reference for such connections.

Table 12 Connection References

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

While it is possible to configure inputs and outputs as the same type, this is not recommended as inputs and outputs must be of opposite type on the device and auxiliary equipment to be compatible. All optocoupled GPIO share the COMMON_IN for inputs and COMMON_OUT for outputs. 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 OUT0 and sourcing output on OUT1.



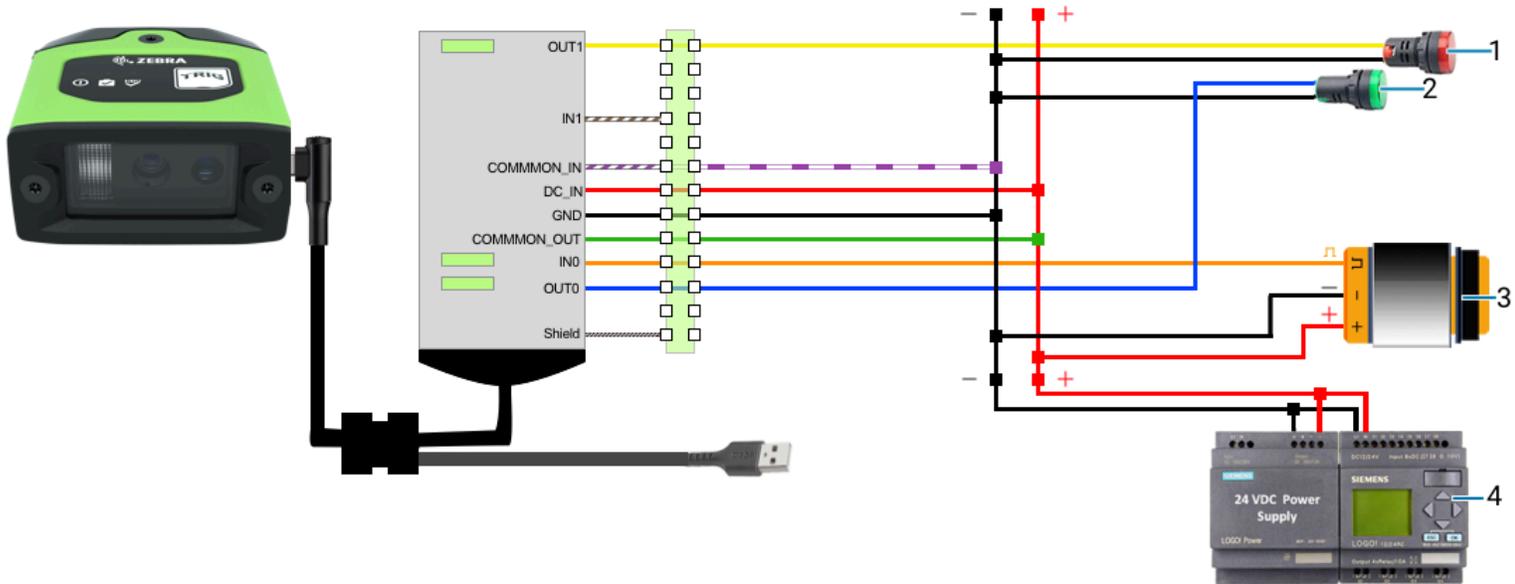
NOTE: Refer to the documentation of the connected auxiliary equipment to ensure a compatible configuration, and remember to leave unused GPIO in a disabled state.

Optocoupled outputs are individually fused to protect against damage from short circuit or overload events. Since no power is consumed from the vision system, optocoupled GPIO are always available regardless of power source and have no impact on power budgeting.

FS10 GPIO Wiring Diagrams

The following diagram shows an FS10 device with two LEDs on outputs indicating job outcome and input trigger from a proximity sensor. The GPIO input is a current sink. The outputs are set as a current source. The power source is a PLC 24VDC PSU, and the GPIO functions are opto-isolated.

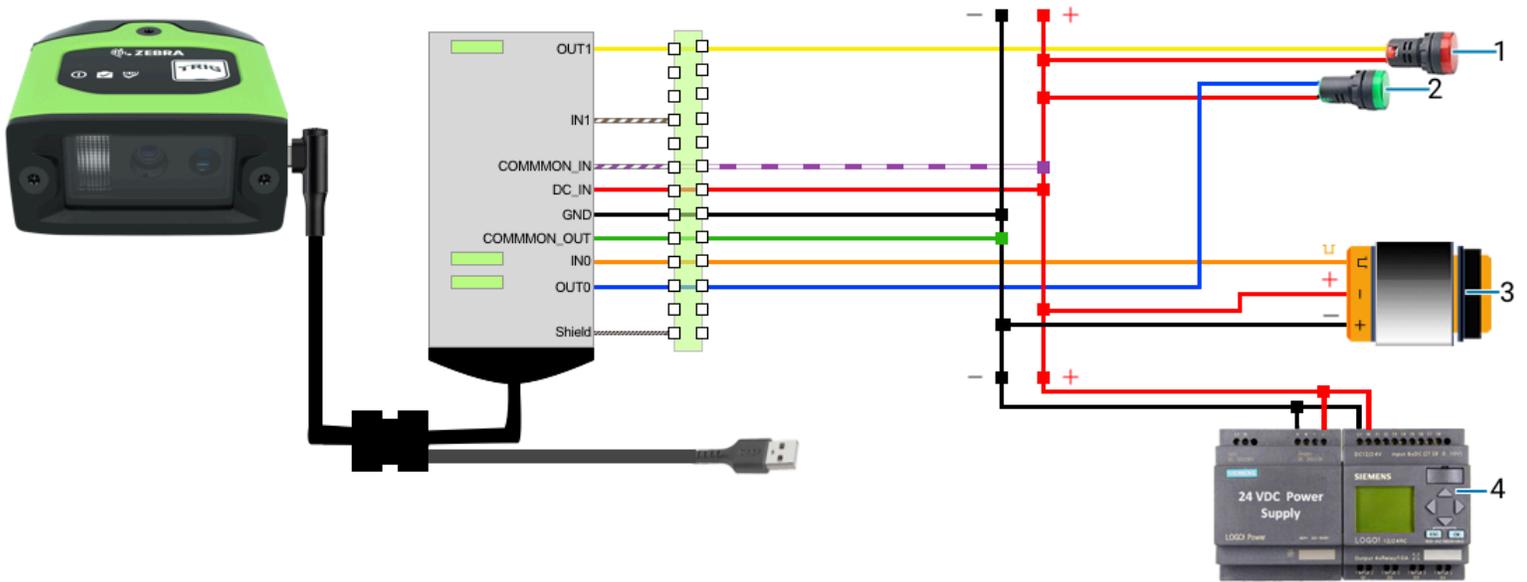
Figure 18 FS10 GPIO Input as Current Sink and Outputs as Current Source



1	Job Fail
2	Job Pass
3	Proximity Sensor
4	Power Supply

The following diagram shows an FS10 device with two LEDs on outputs indicating job outcome and input trigger from a proximity sensor. The GPIO input a the current source. The outputs are set as a current sink. The power source is a PLC 24VDC PSU, and the GPIO functions are opto-isolated.

Figure 19 FS10 GPIO Input as Current Source and Outputs as Current Sink



1	Job Fail
2	Job Pass
3	Proximity Sensor
4	Power Supply

Table 13 Operating Temperature

Temperature	Operating Range
Ambient Temperature	0°C to 45°C (non-POE, duty cycle-dependent)



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

USB Type C

The FS10 can connect to any USB host with a USB-C or USB type A connector. However, the FS10 only supports USB 2.0 and does not support USB 3.0 Super Speed.



CAUTION: For optimal performance, use USB BC1.2 or USB charging ports that can supply up to 1.5A only.

Using Parameter Barcodes

Set feature values by scanning a single barcode or a short barcode sequence. The settings are stored in non-volatile memory and are preserved even when the scanner powers down.



NOTE: Most computer monitors allow scanning barcodes directly on the screen. When scanning from the screen, be sure to set the document magnification to a level where you can see the barcode clearly, and bars and/or spaces do not merge.

If you are not using a USB cable, select a host type after the power-up beeps sound. This is only necessary upon initial power-up when connecting to a new host.

Using Autofocus Barcodes

Use calibration barcodes to set the device's focus settings automatically.



NOTE: This process only adjusts the focus setting on the device and does not adjust exposure or gain.

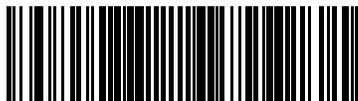
Bring one of the following calibration barcodes into the device field of view:



5s delay



8s delay



13s delay

1. Read one of the autofocus barcodes to start the focus-tuning process based on the selected delay (8s, 13s, or 18s).



NOTE: Observe the status LED flash every 500ms during the delay, providing time to bring the test barcode into the field of view to tune the focus on it.

2. During this delay, bring the desired test barcode into the field of view for the autofocus process to use as a reference. It is recommended to tune the focus of the device with a barcode type that is commonly decoded in your use case.



NOTE: Do not use the calibration barcode as the test barcode to calibrate focus against.

3. After the delay, the autofocus process starts and continues for 5-15 seconds.
4. Listen for the confirmation beeper sequence indicating the focus calibration process is complete.

HID Keyboard Configuration

Parameter #65704

Scan a barcode to enable or disable a HID keyboard



Enable HID Keyboard (Disables CDC Serial)

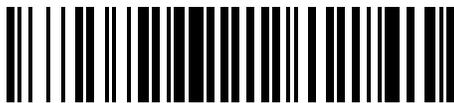


Disable HID Keyboard

HID Keyboard Language

Parameter #65843

Scan a barcode to select a HID keyboard language.



US English



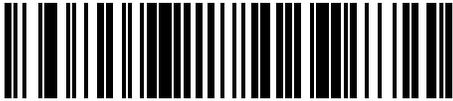
French



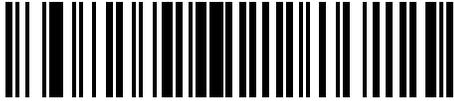
German



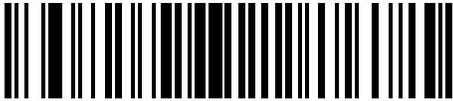
Spanish



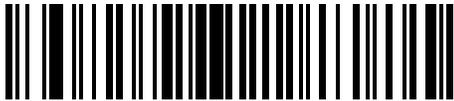
Italian



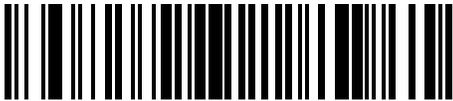
German Linux



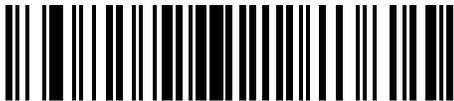
Czech Linux



Polish Linux



Portuguese (Brazil) Linux



UK English Linux

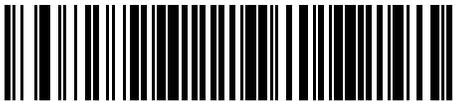


Japanese Linux

HID Keyboard Keystroke Delay

Parameter #65705

Scan a barcode to select a predetermined keystroke delay



Predefined Keystroke Delay 0s



Predefined Keystroke Delay 5ms

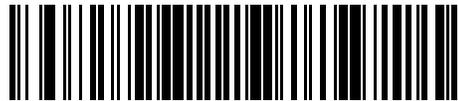
HID Keyboard Special Keystroke Delay

Parameter #65706

Scan a barcode to select a predefined special keystroke delay.



Predefined Special Keystroke Delay 0s



Predefined Special Keystroke Delay 5ms

HID CDC Serial

Parameter #66934

Scan a barcode to enable to disable CDC serial.



Enable CDC Serial (Disable HID)



Disable CDC Serial

HID CDC Serial Results

Parameter #66933

Scan a barcode to enable or disable HID CDC Serial results on the device.



Enable CDC Serial Results



Disable CDC Serial Results

USB Power Configuration

Parameter #65079

Scan a barcode to enable or disable Unrestricted USB-A power.



Enable Unrestricted USB A-Power



Disable Unrestricted USB A-Power

Input/Output (IO) Interface Configuration

TCP Result Output

Parameter #66930

Scan a barcode to enable or disable an IO interface.



Enable TCP Result Output



Disable TCP Result Output

TCP Result Control

Parameter #66915



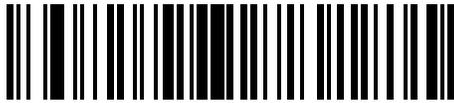
Enable TCP Result Control



Disable TCP Result Control

RS232 Result Output

Parameter #66931



Enable RS232 Result Output



Disable RS232 Result Output

RS232 Result Control

Parameter #66932



Enable RS232 Result Control



Disable RS232 Result Control

Barcode Configuration Mode

Parameter #69035

Scan a barcode to enter or exit barcode configuration mode.



Enter Parameter Barcode Configuration Mode

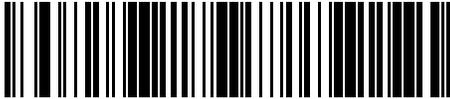


Exit Parameter Barcode Configuration Mode

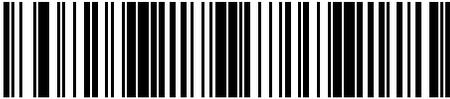
Change Active Job Slot Number

Parameter #69053

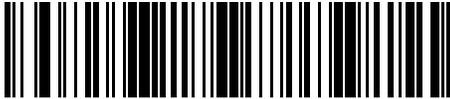
Scan a barcode to change the active job slot to the specified number.



Change Active Job Slot to Number 1



Change Active Job Slot to Number 2



Change Active Job Slot to Number 3



Change Active Job Slot to Number 4



Change Active Job Slot to Number 5



Change Active Job Slot to Number 6



Change Active Job Slot to Number 7



Change Active Job Slot to Number 8

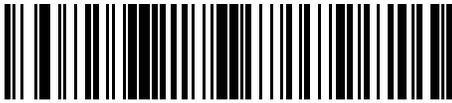


Change Active Job Slot to Number 9

Using Parameter Barcodes



Change Active Job Slot to Number 11



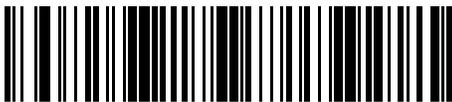
Change Active Job Slot to Number 13



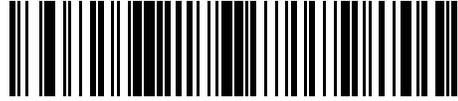
Change Active Job Slot to Number 15



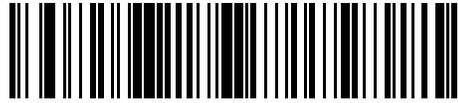
Change Active Job Slot to Number 17



Change Active Job Slot to Number 19



Change Active Job Slot to Number 10



Change Active Job Slot to Number 12



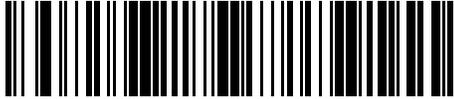
Change Active Job Slot to Number 14



Change Active Job Slot to Number 16



Change Active Job Slot to Number 18



Change Active Job Slot to Number 20

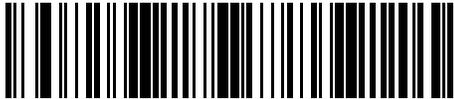
Change Startup Job Slot Number

Parameter #69054

Scan a barcode to change the startup job slot to the specified number.



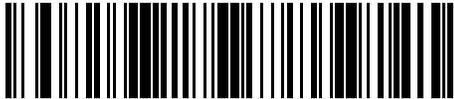
Change Startup Job to Slot Number 1



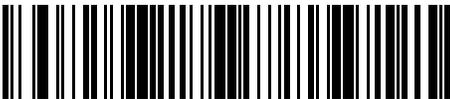
Change Startup Job to Slot Number 2



Change Startup Job to Slot Number 3



Change Startup Job to Slot Number 4



Change Startup Job to Slot Number 5

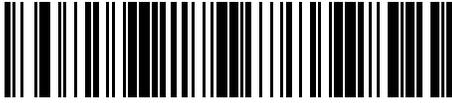


Change Startup Job to Slot Number 6



Change Startup Job to Slot Number 7

Using Parameter Barcodes



Change Startup Job to Slot Number 9



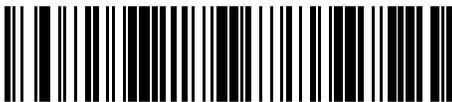
Change Startup Job to Slot Number 11



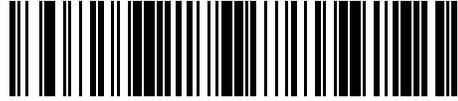
Change Startup Job to Slot Number 13



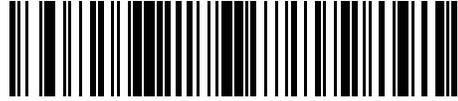
Change Startup Job to Slot Number 15



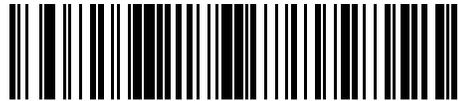
Change Startup Job to Slot Number 17



Change Startup Job to Slot Number 8



Change Startup Job to Slot Number 10



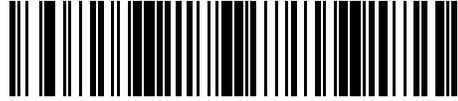
Change Startup Job to Slot Number 12



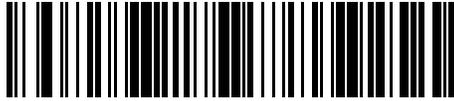
Change Startup Job to Slot Number 14



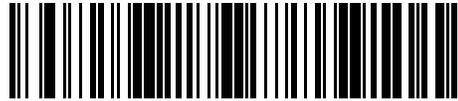
Change Startup Job to Slot Number 16



Change Startup Job to Slot Number 18



Change Startup Job to Slot Number 19



Change Startup Job to Slot Number 20

Reboot Device

Parameter #69030

Scan the following barcode to reboot the device.



Reboot the Device

Restart Core Services

Parameter #69031

Scan the barcode to restart core services.



Restart Core Services

Maintenance

To maintain Zebra devices, avoid harmful chemicals such as acetone as they damage plastics. Only use approved cleaning agents such as pre-moistened wipes and 70% isopropyl alcohol. Use a dampened soft cloth for routine cleaning to avoid liquid pooling and direct spraying into the scanner exit window.

Known Harmful Ingredients

The following chemicals are known to damage the plastics on Zebra scanners 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 scanners:

- Pre-moistened wipes
- Isopropyl alcohol 70%

Tolerable Industrial Fluids and Chemicals



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

The following industrial fluids and chemicals were evaluated and deemed tolerable for the FS/VS Smart Camera series.

- 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.

To clean the device:

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 liquid directly to the scanner. Be careful not to let liquid pool around the scanner window, trigger, cable connector or any other area on the device.
3. Be sure to clean the trigger area by wiping the surface with careful attention to avoid lifting the label from the device.
4. Do not spray water or other cleaning liquids directly into the exit window.
5. Wipe the scanner exit window with a 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. Scanner 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 connector on the Zebra scanner at least 3 times. Do not leave any cotton residue on the connector.
 - c. Use the cotton-tipped applicator dipped in alcohol to remove any grease and dirt near the connector area.

Use a dry cotton tipped applicator and rub the cotton portion of the cotton-tipped applicator back-and-forth across the connectors at least three times. Do not leave any cotton residue on the connectors.

Troubleshooting

This section describes potential issues that could arise while using the device and possible solutions such as power cycling or pinging the device.

Table 14 Troubleshooting the Device

Problem	Cause	Solution
Device is not connecting to network when using Device Discovery.	Specific ports that are utilized by the application are blocked by Windows Defender Firewall.	Ensure that Zebra Aurora has access to Domain, Public and Private networks.
	Ensure that the device is visible in the Windows Network by viewing the File Explorer and selecting Network.	If the device is not viewable under the Network dropdown 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 a RNDIS driver, go to the Windows Device Manager and search under the Network Adapters dropdown.
Device is cycling power or data connection on USB port.	USB cable may be loose or intermittent.	Reseat the USB cable and tighten locking screws firmly.
	USB port does not source enough power.	Use another USB port that is BC1.2, USB charging, USB-C or has enough power. Use an appropriate cable that utilizes an external power supply.

Communicating With the Device

Pinging via IP and pinging via hostname are two common strategies that you can use to communicate with the device.

Pinging the Device via IP

Users can ping the device by providing the IP address via command prompt or powershell to communicate with the device.

To ping the device via IP address:

1. Open a command prompt or powershell.
2. Enter the following command: ping <ip address>

3. Check to see if the device responds or fails to respond.

Example: Pinging 192.168.4.100 with 32 bytes of data:

- Reply from 192.168.4.100: bytes= 32 time=1ms TTL=64
- Reply from 192.168.4.100: bytes= 32 time=1ms TTL=64
- Reply from 192.168.4.100: bytes= 32 time=1ms TTL=64

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.

Factory Reset the Device

Perform a factory reset on the device using the hardware buttons.

1. Disconnect all power sources.
2. Press and hold the TRIG button on the device.
3. Connect to a power source.
4. Continue to hold the TRIG button.

After 20 seconds, the device's Power LED turns yellow to green, and the Ethernet LED turns orange to amber.

5. Release the TRIG within 5 seconds after the Ethernet LED changes to amber.

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.

