

MICROSCAN®

Vision MINI Smart Camera Guide



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Welcome!

Purpose of This Manual

This manual contains detailed information about the Vision MINI Smart Camera.

Manual Conventions

The following typographical conventions are used throughout this manual.

- Items emphasizing important information are **bolded**.
- Menu selections, menu items and entries in screen images are indicated as: Run (triggered), Modify..., etc.

CHAPTER 1 Introduction

FIGURE 1-1. Vision MINI Smart Camera



Product Summary

The Vision MINI Smart Camera is designed for reliable vision performance in embedded identification and inspection applications. As the world's smallest fully-integrated vision system, the Vision MINI's compact size and wide angle optics provide the best performance available for machine vision tasks at close range.

The Vision MINI allows OEM design engineers to implement inspection, color matching, symbol decoding, OCR, and more, in a single compact solution. The camera's small form factor allows flexible positioning in tight spaces. The lightweight and durable magnesium alloy case weighs less than 2 ounces.

Pressing the AutoVISION button at the back of the Vision MINI enables real time dynamic autofocus. When an object is centered in the field of view and the AutoVISION button is pressed, the camera automatically adjusts focal distance and sets internal parameters to optimize image captures.

AutoVISION software, designed for use with the Vision MINI, provides an intuitive interface, step-by-step configuration, and a library of presets that allow easy setup and deployment. For more complex vision applications, the system can be upgraded from AutoVISION to Visionscape.

Features and Benefits

- World's smallest fully functional vision system
- USB connectivity
- OEM-ready for easy integration
- Integrated lighting and autofocus lens
- Flexible programming options for custom applications
- AutoVISION button for automatic targeting, calibration, and triggering
- Simplified configuration with AutoVISION software

Applications

- Part presence/absence
- Color detection and matching
- Medical device inspection
- Fiducial location
- Part location/orientation detection
- Packaging
- Robotics
- Auto ID (Data Matrix and other 2D symbologies, 1D, OCR)

Package Contents

Before you install AutoVISION software and connect your Vision MINI Smart Camera, please take a moment to confirm that the following items are available:

- Vision MINI Smart Camera — Your package contains one of the available models listed in Table 1–1.
- USB Type A to USB Type B Cable
- AutoVISION Software Installation USB Drive

Vision MINI Smart Camera Models

Table 1–1 lists and describes the Vision MINI Smart Camera models, including acquisition modes and resolutions.

TABLE 1–1. Vision MINI Smart Camera Models

Part Number	Vision MINI Smart Camera Model
GMV-6300-2110G	Vision MINI Smart Camera, USB, SD, SXGA, Built-In Light, AutoVISION
GMV-6300-2112G	Vision MINI Smart Camera, USB, SD, SXGA, Built-In Light, AutoVISION + Visionscape
GMV-6300-2172G	Vision MINI Smart Camera, USB, SD, Color QXGA, Visionscape
GMV-6300-2210G	Vision MINI Smart Camera, USB, HD, SXGA, Built-In Light, AutoVISION
GMV-6300-2212G	Vision MINI Smart Camera, USB, HD, SXGA, Built-In Light, AutoVISION + Visionscape
GMV-6300-2272G	Vision MINI Smart Camera, USB, HD, Color QXGA, Visionscape

Part Number Structure

GMV	6300						
General Machine Vision	Vision MINI	Comm	Lens	Sensor	Options	RoHS G = RoHS compliant	Custom 0 to 99
		2 = USB	1 = Standard Density	1 = SXGA 7 = Color QXGA	0 = AutoVISION		
			2 = High Density		1 = Custom 2 = Visionscape 3 = Custom + Visionscape		

System Components

This section contains information about system components as well as information to help you connect the Vision MINI Smart Camera. Specific information describes connectors, adapters, cables, pinouts, and signals.

Note: There are no user-serviceable parts inside.

Hardware Components

Table 2-1 lists Vision MINI Smart Camera hardware components.

TABLE 2-1. Vision MINI Smart Camera Hardware Components

Part Number	Description
Cameras	
GMV-6300-2110G	Vision MINI Smart Camera, USB, SD, SXGA, Built-In Light, AutoVISION
GMV-6300-2112G	Vision MINI Smart Camera, USB, SD, SXGA, Built-In Light, AutoVISION + Visionscape
GMV-6300-2172G	Vision MINI Smart Camera, USB, SD, Color QXGA, Visionscape
GMV-6300-2210G	Vision MINI Smart Camera, USB, HD, SXGA, Built-In Light, AutoVISION
GMV-6300-2212G	Vision MINI Smart Camera, USB, HD, SXGA, Built-In Light, AutoVISION + Visionscape
GMV-6300-2272G	Vision MINI Smart Camera, USB, HD, Color QXGA, Visionscape

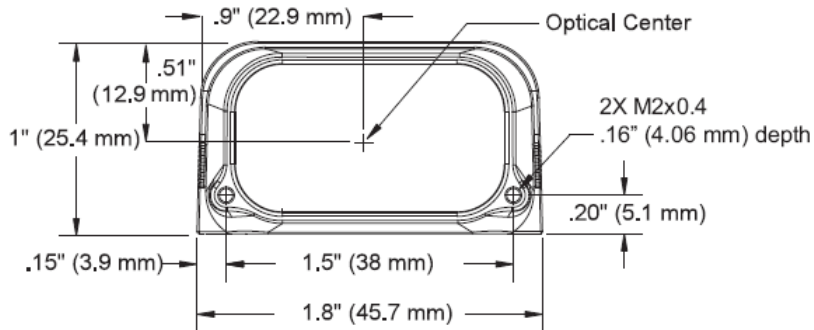
TABLE 2–1. Vision MINI Smart Camera Hardware Components (Continued)

Part Number	Description
Demo Kit	
98-000215-01	Demo Kit (Carrying case, mounting blocks, mounting rods, power supply, IC-332, IB-131, cables, object detector, test cards, documentation)
Power Supply	
97-100004-15	Power Supply, 90-254 VAC, 24VDC, USA/Euro Plug
97-000002-02	Power Supply, 90-254 VAC, +5VDC
Communication and I/O Devices and Cables	
FIS-0001-0035G	IC-332 Adapter
FIS-0210-000XG	MS-Connect 210 Connectivity Box
99-000018-01	IB-131 Interface Box
61-000105-01	Host Cable, MS-Connect 210 to Host, stripped-to-9-pin
61-000127-01	Camera Cable, MS-Connect 210 to Camera, 6'
61-000208-01	USB Type A to USB Type B Cable, 6'
61-300026-03	Communication Cable, DB25 Plug to DB9 Socket, 6'
Mounting Options	
98-000048-01	Mounting Arm Kit
98-000053-01 (4") 98-000053-02 (3")	Extension Joint Kit
98-000054-01	Base Plate Kit
98-000057-01	Through-Hole Mount Bracket
98-000060-01	Side Mount Bracket
98-000088-01	Right-Angle Mirror Kit
98-000098-01	Diffuser Accessory Kit
Object Detectors	
99-000017-01	Photo Sensor, Visible, NPN, Dark On
99-000017-02	Photo Sensor, Visible, NPN, Light On, MS-Connect 210 Configuration
99-000019-01	Photo Sensor, Visible, NPN, Light On, USB Configuration
Documentation	
37-000010-01	Microscan Tools Drive (Software, User's Manuals, Quick Start Guides, Configuration Guides, links to other documents on Microscan website)

Front

Figure 2–1 shows the front of the Vision MINI Smart Camera.

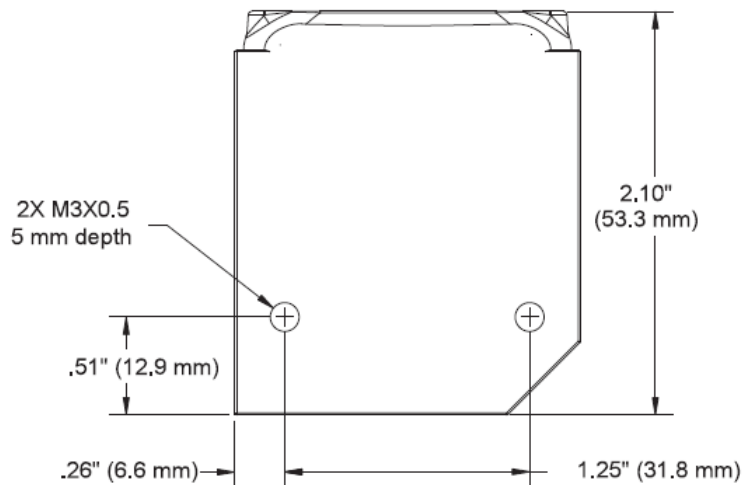
FIGURE 2–1. Front



Base

Figure 2–2 shows the base of the Vision MINI Smart Camera.

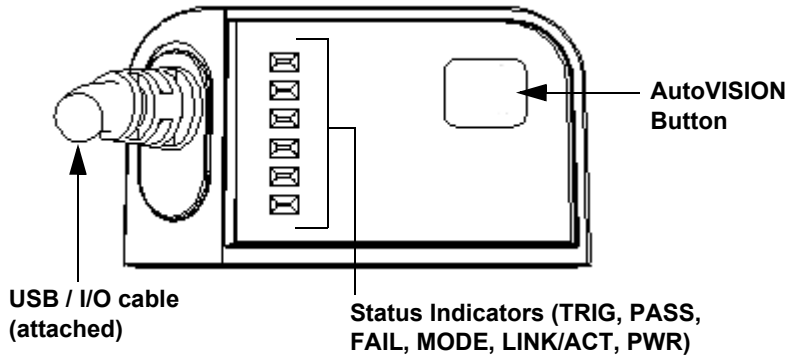
FIGURE 2–2. Base



Back

Figure 2-3 shows the back of the Vision MINI Smart Camera.

FIGURE 2-3. Back



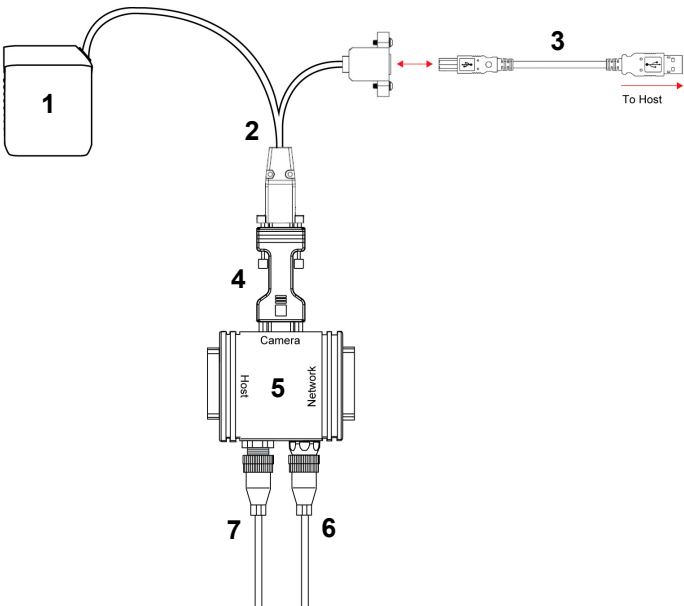
Important Label Information

Each Vision MINI Smart Camera has its own label, which contains important information about that camera.

- P/N – The Microscan part number of your Vision MINI Smart Camera.
- S/N — The serial number of your Vision MINI Smart Camera.
- MAC — The MAC address of your Vision MINI Smart Camera.
- Type — The model type of your Vision MINI Smart Camera.

Mounting and Wiring the Vision MINI Smart Camera

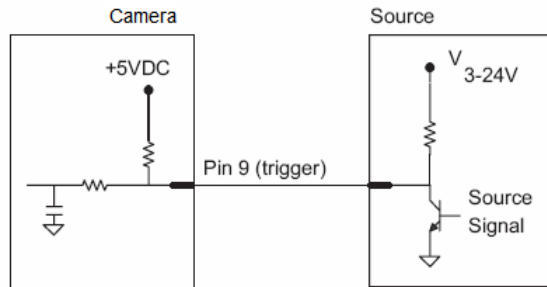
- Mount the camera (1) securely in its camera stand (not supplied).
- Make sure the camera (1) is mounted at the optimal distance of 2” to 6”.
- Mount the camera (1) as required by the application.
- Connect the USB side of the camera cable (2) to the USB host cable (3).
- Connect the IC-332 (4) to the IB-131 (5).
- Connect the D-sub side of the camera cable (2) to the IC-332 (4).
- Connect the trigger (6) to the IB-131 (5).
- Connect the power supply (7) to the IB-131 (5).
- Plug in the power supply (7).



Direct Input / Output Diagrams

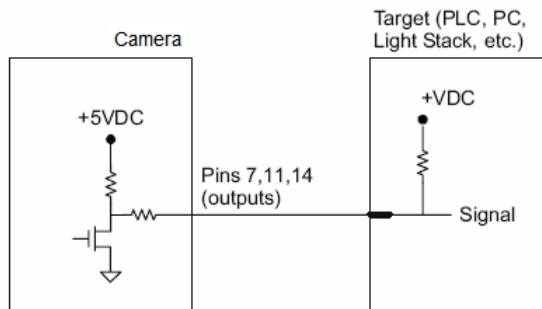
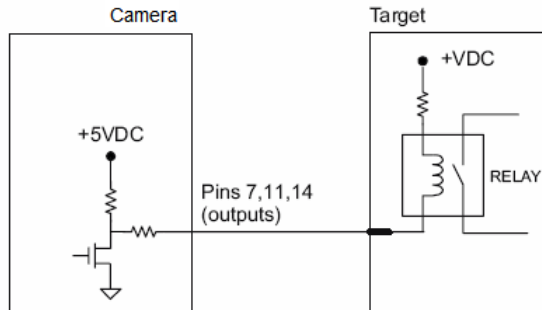
Trigger Input Example

Trigger, New Master Inputs: 3 to 24V rated, 1mA @ 5VDC



Output Examples

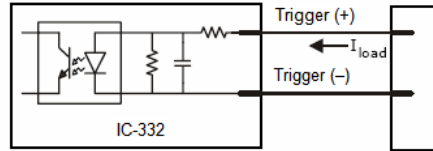
Outputs (1, 2, 3): 5V TTL compatible, can sink 10mA and source 2mA



Isolated Trigger Input with IC-332

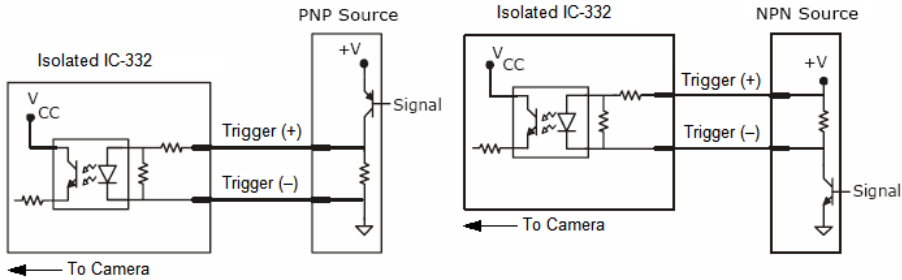
Trigger input can be fully electrically isolated from an NPN or PNP signal source.

	Minimum	Maximum
$V_{IN-HIGH}/I_{IN-HIGH}$	4.5V/3.0mA	28V/15mA
V_{IN-LOW}/I_{IN-LOW}	0V/0mA	2.0V/1mA
Pulse Width _{min}	48 μ s	

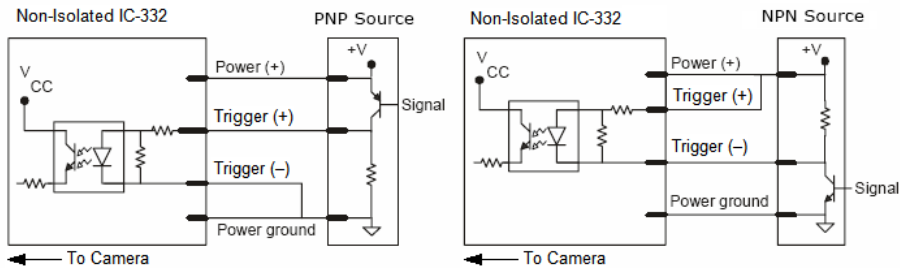


Input Examples

Fully Optoisolated



Not Optoisolated

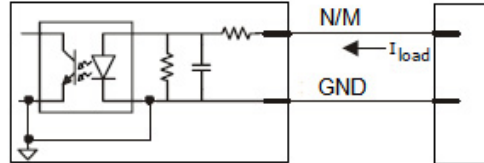


New Master Input with IC-332

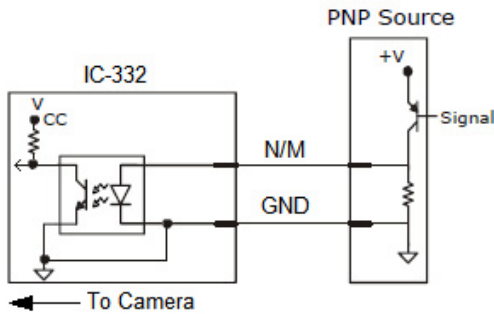
The IC-332 converts N/M input to TTL signal through an optoisolator.

Note that the return for N/M is internally grounded, and therefore it is not fully electrically isolated.

	Minimum	Maximum
$V_{IN-HIGH}/I_{IN-HIGH}$	4.5V/3.0mA	28V/15mA
V_{IN-LOW}/I_{IN-LOW}	0V/0mA	2.0V/1mA
Pulse Width _{min}	48μS	



Example Circuit



Power Requirements

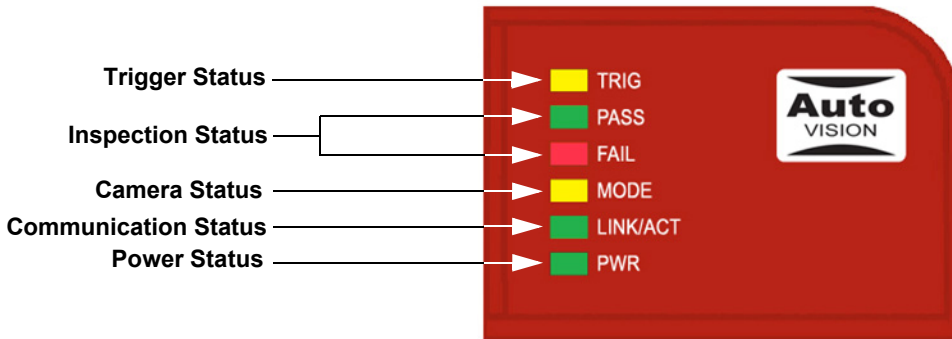
Refer to Table 2-3 when determining the power supply requirements for your camera.

TABLE 2-3. Camera Power Requirements

Component	5VDC
Vision MINI Smart Camera SXGA	5VDC +/- 5%, 200 mV p-p max. ripple, 465 mA @ 5VDC (typ.), 4.5 watts (max.)
Vision MINI Smart Camera QXGA	5VDC +/- 5%, 200 mV p-p max. ripple, 400 mA @ 5VDC (typ.), 4.2 watts (max.)

Status Indicators

The back of the Vision MINI Smart Camera has multiple LEDs that indicate different trigger, inspection, camera, communication, and power states.



TRIG	On Steady	Continuous Trigger
	Off	Waiting for Trigger Event
	On Flashing	Trigger Event
PASS/FAIL	On	Active State
	Off	Inactive State
MODE	On Steady	Unit Ready
	Off	Unit Not Ready
LINK/ACT	On Steady	Link Established
	Off	No Link/Activity
	On Flashing	Link Established and Activity on Link
PWR	On	Power On
	Off	No Power Applied to Unit

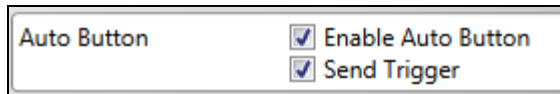
Additional User Feedback

- Green Flash – A green flash from the front of the unit indicates a Good Read.
- Blue Targeting Pattern – The blue targeting pattern from the front of the unit allows the user to center an object in the camera's field of view.
- Beeper – The beeper is an audible verification that either a Pass or a Fail has occurred.

AutoVISION Button



The AutoVISION Button has two positions, selectable by the length of time the button is held down, and indicated by one or two beeps in succession. It can also be used to send a trigger signal when **Send Trigger** is checked in AutoVISION software's **Connect** view. When the trigger functionality is enabled, pushing the AutoVISION Button triggers the camera to capture an image.



1st Position: Blue Targeting Pattern

The first AutoVISION Button position turns the targeting system on. This overrides any other targeting modes that have been configured.

2nd Position: Auto Calibration

The second AutoVISION Button position starts the Auto Calibration process, which selects the appropriate photometry and focus settings for the camera. The selected values are then saved for power-on.

3

CHAPTER 3

Optics and Lighting

This section describes the optical and illumination characteristics of the Vision MINI Smart Camera.

Optics

The monochrome and color versions of the Vision MINI Smart Camera have a built-in CMOS sensor, available in Standard Density or High Density (2.5 mm).

Optics Specifications

Part Number	GMV-6300-2110G	GMV-6300-2112G	GMV-6300-2210G	GMV-6300-2212G	GMV-6300-2172G	GMV-6300-2272G
Sensor	CMOS, Rolling Shutter					
Sensor Format	1/2"					
Sensor Color	Monochrome			Color		
Resolution	SXGA (1280 x 1024)			QXGA (2048 x 1536)		
Autofocus Range	2" to 6"					
Horizontal Field of View	1.3" to 6.3"					
Pixel Size	5.2um x 5.2um			3.2um x 3.2um		

SXGA (1280 x 1024) Field of View

Standard Density			High Density		
Working Distance	Horizontal FOV	Vertical FOV	Working Distance	Horizontal FOV	Vertical FOV
2	2.186	1.749	2	1.264	1.011
3	3.182	2.545	3	1.850	1.480
4	4.177	3.342	4	2.436	1.949
5	5.173	4.138	5	3.022	2.418
6	6.168	4.935	6	3.608	2.886

QXGA (2048 x 1536) Field of View

Standard Density			High Density		
Working Distance	Horizontal FOV	Vertical FOV	Working Distance	Horizontal FOV	Vertical FOV
2	2.165	1.749	2	1.264	0.948
3	3.180	2.545	3	1.850	1.388
4	4.195	3.342	4	2.436	1.827
5	5.210	4.138	5	3.022	2.267

Illumination

The Vision MINI Smart Camera has built-in lighting (red LEDs). The LEDs can be configured to operate in multiple modes – Continuous, Strobe, and Off.

Lighting Specifications

Part Number	GMV-6300-2110G	GMV-6300-2112G	GMV-6300-2210G	GMV-6300-2212G	GMV-6300-2172G	GMV-6300-2272G
LED Color	Red @ 617nm				White	

Lighting Examples

The following lighting examples were captured with a Standard Density Vision MINI.

FIGURE 3–1. Semi-Specular Surface (Fine Matte Metal Ruler) at 2", 90°

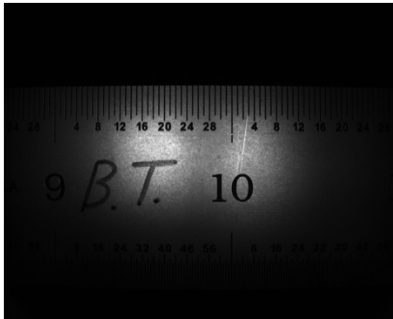
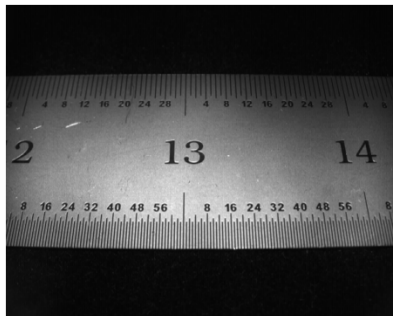


FIGURE 3–2. Off-Axis – Semi-Specular Surface (Fine Matte Metal Ruler) at 2", 90°



Machine Vision Lighting Principles

Proper lighting is critical to the success of a machine vision application. The Vision MINI features integrated lighting (built-in red LEDs @ 617nm). Depending on the requirements of your application, you may also need to add external lighting from Microscan's NERLITE family of machine vision lighting products.

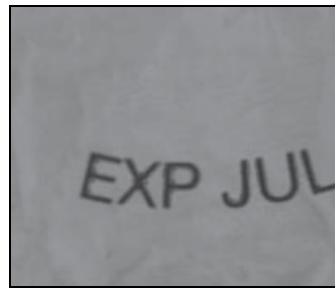
Consider the following when setting up your application:

- Is the surface of the object flat, slightly bumpy, or very bumpy?
- Is the surface matte or shiny?
- Is the object curved or flat?
- What is the color of the object or area being inspected?
- Is the object moving or stationary?

Machine vision lighting should maximize contrast of the areas or features being inspected while minimizing the contrast of everything else.



Before correct lighting



**After correct lighting with
a NERLITE CDI Illuminator**

A

APPENDIX A

Connector Pinouts

This section contains information about the Vision MINI Smart Camera's USB and I/O connectors.

A

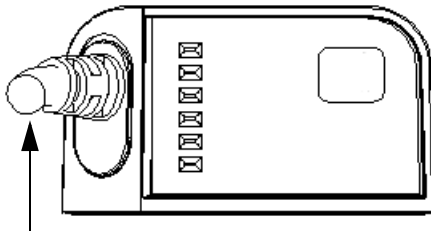
Connector Pinouts

Vision MINI Smart Camera Connectors

USB and I/O Cable

Figure A–1 shows the location of the USB and I/O cable.

FIGURE A-1. USB and I/O Cable



USB / I/O Cable (attached)

TABLE A–1. and TABLE A-2. describe the USB and I/O cable signals.

TABLE A-1. USB and I/O Cable Pin Assignments (15-pin D-sub Socket)

Pin	Host RS-232	In/Out
1	Power +5VDC	In
2	TxD	Out
3	RxD	In
4	Power/Signal Ground	
5	NC	
6	NC	Out
7	Output 1 TTL (Can sink 10mA and souce 10mA)	Out
8	Default configuration (activated by connecting pin 8 to ground pin 4)	In
9	Trigger	In
10	NC	In
11	Output 3 TTL (Can sink 10mA and souce 10mA)	Out
12	Input 1 (NPN)	In
13	Chassis ground (Connects chassis body to earth ground only. Do not use as power or signal return.)	
14	Output 2 TTL (Can sink 10mA and souce 10mA)	Out
15	NC	

Figure A-2 shows the pinout of the 15-pin D-sub Socket.

FIGURE A-2. 15-pin D-sub Socket

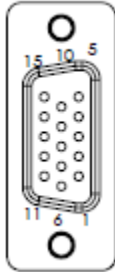
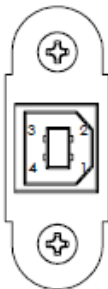


TABLE A-2. USB and I/O Cable Pin Assignments (USB Type B Socket)

Pin	Function
1	Vbus (5V)
2	D-
3	D+
4	Ground

Figure A-3 shows the pinout of the USB Type B Socket.

FIGURE A-3. USB Type B Socket



Cable Specifications

This section contains information about Vision MINI Smart Camera cables.

Note: Cable specifications are published for information only. Microscan does not guarantee the performance or quality of cables provided by other suppliers.

TABLE B-1. Cable Part Numbers and Descriptions

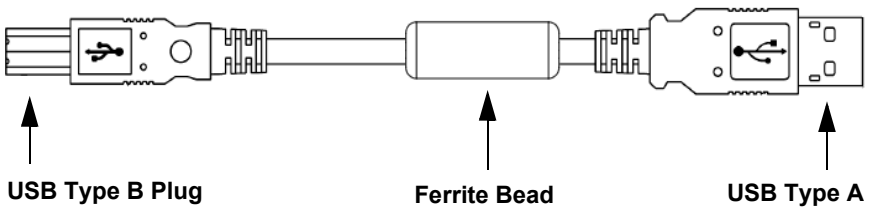
Part Number	Description
61-000105-01	Host Cable, MS-Connect 210 to Host, stripped-to-9-pin
61-000196-02	Cable, Vision MINI, USB / I/O (attached to camera)
61-000208-01	USB Type A to USB Type B Cable, 6'
61-300026-03	Communication Cable, DB25 Plug to DB9 Socket, 6'
97-000002-02	Power Supply, 90-254 VAC, +5VDC
97-100004-15	Power Supply, 90-254 VAC, 24VDC, USA/Euro Plug
99-000017-01	Photo Sensor, Visible, NPN, Dark On
99-000017-02	Photo Sensor, Visible, NPN, Light On, MS-Connect 210 Configuration
99-000019-01	Photo Sensor, Visible, NPN, Light On, USB Configuration

61-000208-01 USB Type A to USB Type B Plug Cable

The 61-000208-01 USB Type A to USB Type B Plug Cable is a double-ended shielded ferrite bead USB cable.

Figure B-1 shows the 61-000208-01 USB Type A to USB Type B Plug Cable.

FIGURE B-1. USB Type A to USB Type B Plug Cable



61-000105-01 Host Cable, MS-Connect 210 to Host, Stripped to 9-Pin Socket

The 61-000105-01 Host Cable, MS-Connect 210 to Host is a single-ended shielded serial cable with a DB9 connector on one end, intended for configurations that include the MS-Connect 210 Wiring Box.

Figure B-2 shows the 61-000105-01 Host Cable, MS-Connect 210 to Host.

FIGURE B-2. Host Cable, MS-Connect 210 to Host

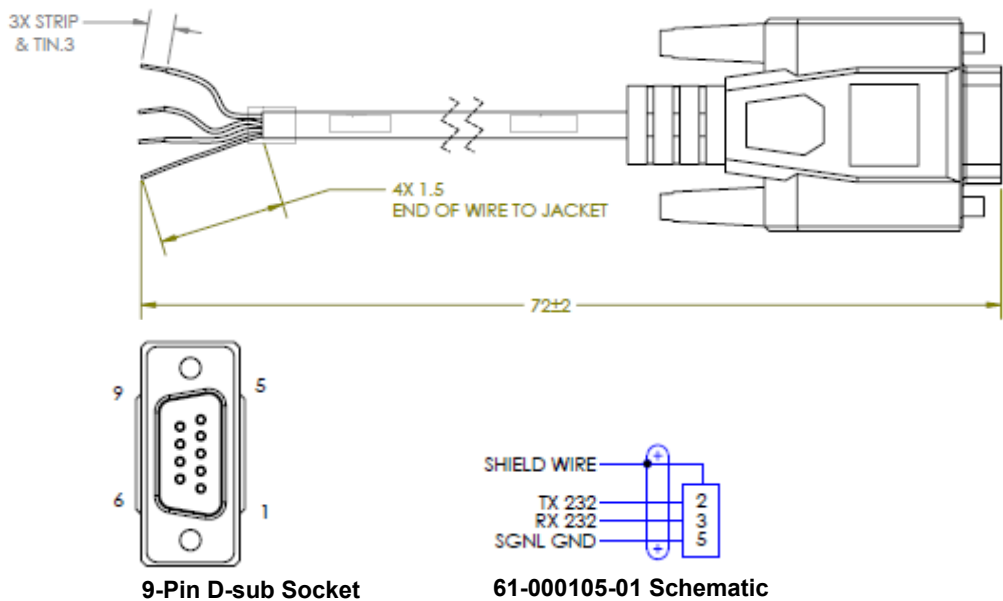


Table B-2 describes the signals for the 61-000105-01 Host Cable, MS-Connect 210 to Host.

TABLE B-2. Host Cable, MS-Connect 210 to Host Pin Assignments

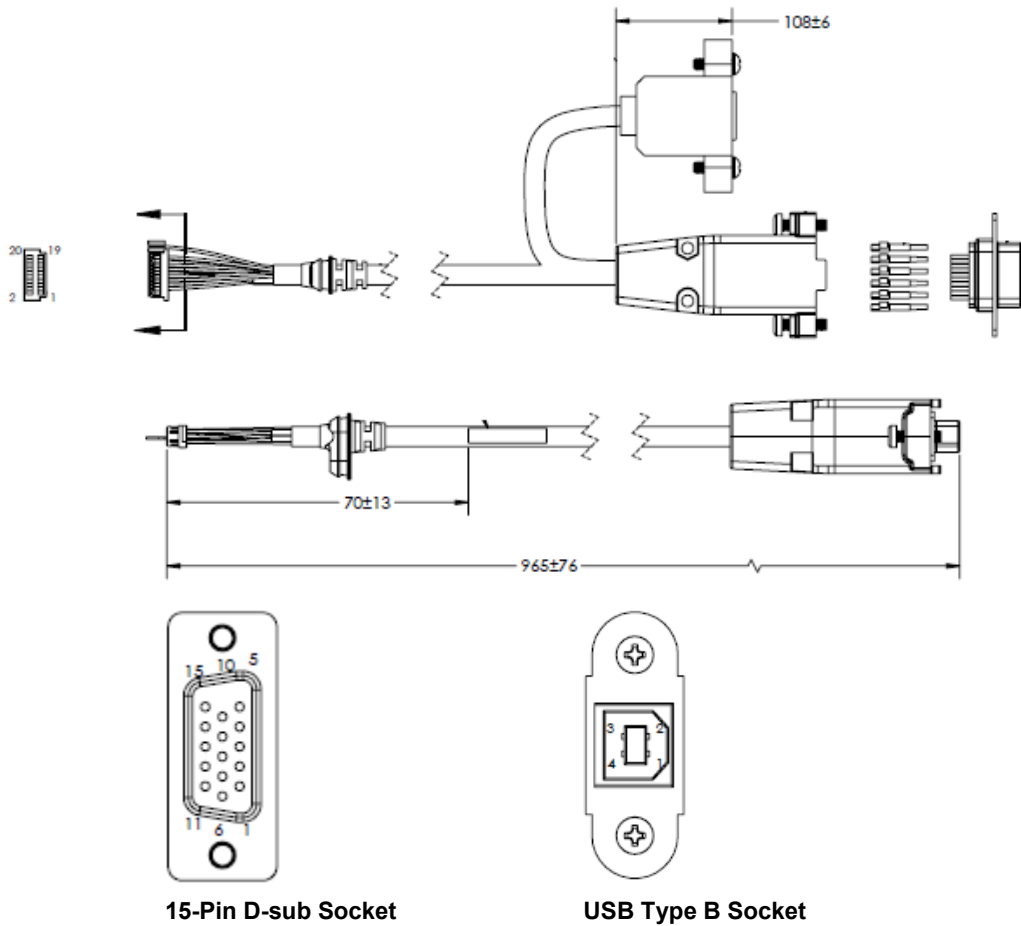
Pin	Function
2	TX 232
3	RX 232
5	Signal Ground

61-000196-02 Vision MINI USB / I/O Cable (Attached)

The 61-000196-02 Vision MINI USB / I/O Cable is attached to the camera. It is a shielded cable in a “pigtail” configuration with a USB Type B socket and an RS-232 15-pin D-sub socket.

Figure B-3 shows the 61-000196-02 Vision MINI USB / I/O Cable.

FIGURE B-3. Vision MINI USB / I/O Cable (Attached)



Tables B-3 and B-4 describe the signals for the 61-000196-02 Vision MINI USB / I/O Cable.

TABLE B-3. USB and I/O Cable Pin Assignments (15-pin D-sub Socket)

Pin	Host RS-232	In/Out
1	Power +5VDC	In
2	TxD	Out
3	RxD	In
4	Power/Signal Ground	
5	NC	
6	NC	Out
7	Output 1 TTL (Can sink 10mA and souce 10mA)	Out
8	Default configuration (activated by connecting pin 8 to ground pin 4)	In
9	Trigger	In
10	NC	In
11	Output 3 TTL (Can sink 10mA and souce 10mA)	Out
12	Input 1 (NPN)	In
13	Chassis ground (Connects chassis body to earth ground only. Do not use as power or signal return.)	
14	Output 2 TTL (Can sink 10mA and souce 10mA)	Out
15	NC	

TABLE B-4. USB and I/O Cable Pin Assignments (USB Type B Socket)

Pin	Function
1	Vbus (5V)
2	D-
3	D+
4	Ground

61-300026-03 Communication Cable, DB25 Plug to DB9 Socket

The 61-300026-03 Communication Cable, DB25 Plug to DB9 Socket is a shielded RS-232 cable ending in a 25-pin D-sub plug and a 9-pin D-sub socket.

Figure B-4 shows the 61-300026-03 Communication Cable, DB25 Plug to DB9 Socket.

FIGURE B-4. Communication Cable, DB25 Plug to DB9 Socket

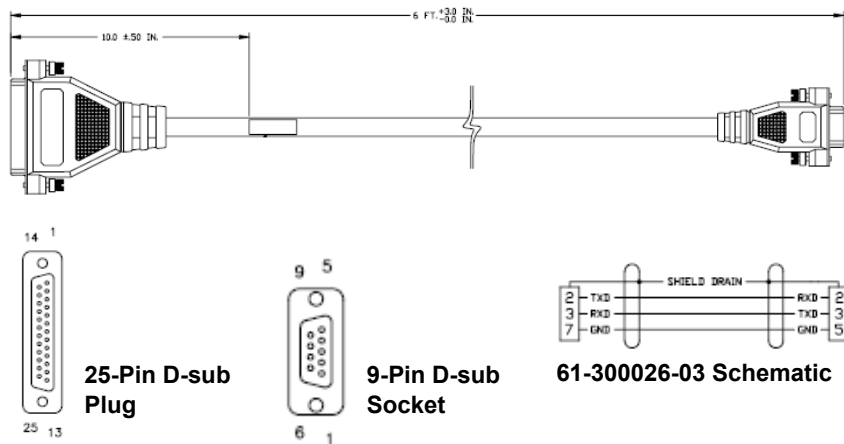


Table B-5 describes the signals for the 61-300026-03 Communication Cable, DB25 Plug.

TABLE B-5. Communication Cable, DB25 Plug Pin Assignments

Pin	Function
2	TxD
3	RxD
7	Ground

Table B-6 describes the signals for the 61-300026-03 Communication Cable, DB9 Socket.

TABLE B-6. Communication Cable, DB9 Socket Pin Assignments

Pin	Function
2	RxD
3	TxD
5	Ground

97-000002-02 Power Supply, 90-254 VAC, +5VDC

The 97-000002-02 Power Supply, 90-254 VAC, +5VDC ends in a 3-pin Micro-Change connector.

Figure B-5 shows the 97-000002-02 Power Supply, 90-254 VAC, +5VDC.

FIGURE B-5. Power Supply, 90-254 VAC, +5VDC

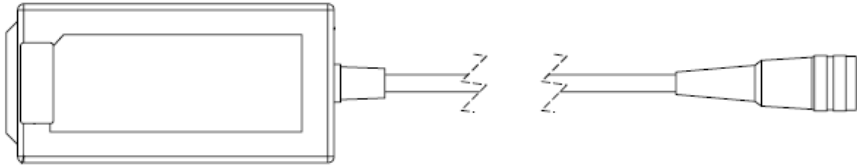


Table B-7 describes the signals for the 97-000002-02 Power Supply, 90-254 VAC, +5VDC.

TABLE B-7. Power Supply, 90-254 VAC, +5VDC Pin Assignments

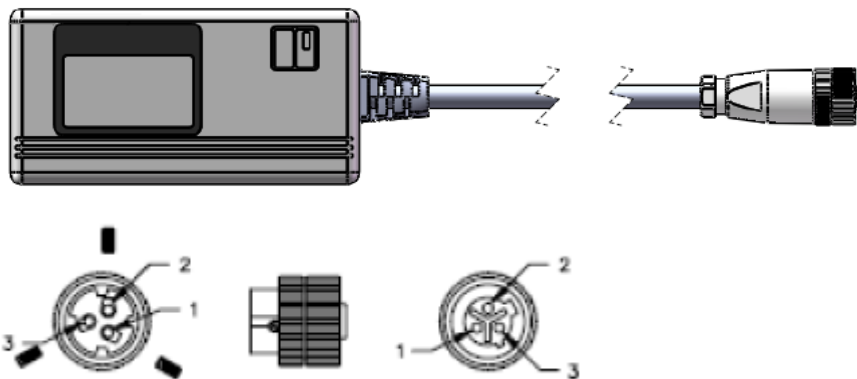
Pin	Function
1	Ground (Black)
2	Shield (Bare)
3	+5VDC (White)

97-100004-15 Power Supply, 90-254 VAC, 24VDC, USA/Euro Plug

The 97-100004-15 Power Supply, 90-254 VAC, 24VDC, USA/Euro Plug ends in a 3-pin Micro-Change connector and comes with both a U.S. and Euro plug.

Figure B-6 shows the 97-100004-15 Power Supply, 90-254 VAC, 24VDC, USA/Euro Plug.

FIGURE B-6. Power Supply, 90-254 VAC, 24VDC, USA/Euro Plug



3-Pin Micro-Change Connector

Table B-8 describes the signals for the 97-100004-15 Power Supply, 90-254 VAC, 24VDC, USA/Euro Plug.

TABLE B-8. Power Supply, 90-254 VAC, 24VDC, USA/Euro Plug Pin Assignments

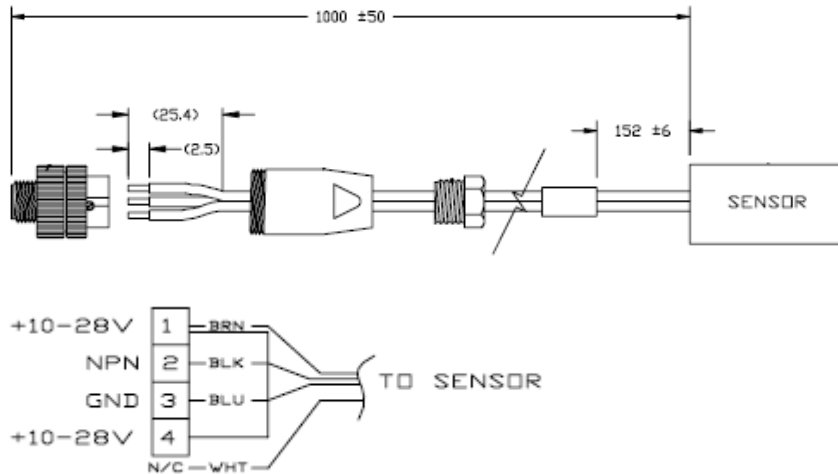
Pin	Function
1	Ground (Black)
2	Shield (Bare)
3	+24VDC (White)

99-000017-01 Photo Sensor, Visible, NPN, Dark On

The 99-000017-01 Photo Sensor, Visible, NPN, Dark On is an external trigger device with a 4-pin Micro-Change connector.

Figure B-7 shows the 99-000017-01 Photo Sensor, Visible, NPN, Dark On.

FIGURE B-7. Photo Sensor, Visible, NPN, Dark On



99-000017-01 Schematic

Table B-9 describes the signals for the 99-000017-01 Photo Sensor, Visible, NPN, Dark On.

TABLE B-9. Photo Sensor, Visible, NPN, Dark On Pin Assignments

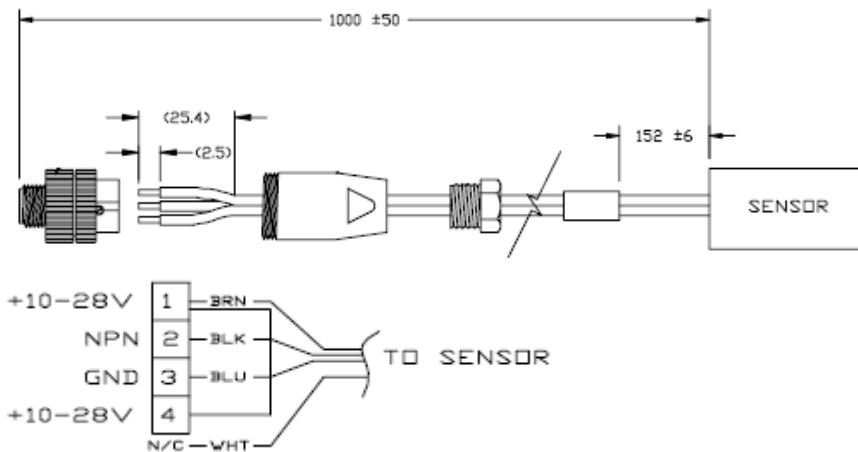
Pin	Function
1	+10-28V
2	NPN
3	Ground
4	+10-28V

99-000017-02 Photo Sensor, Visible, NPN, Light On, MS-Connect 210 Configuration

The 99-000017-02 Photo Sensor, Visible, NPN, Light On, MS-Connect 210 Configuration is an external trigger device with a 4-pin Micro-Change connector, intended for use in configurations that include an MS-Connect 210 Wiring Box.

Figure B-8 shows the 99-000017-02 Photo Sensor, Visible, NPN, Light On, MS-Connect 210 Configuration.

FIGURE B-8. Photo Sensor, Visible, NPN, Light On, MS-Connect 210 Configuration



99-000017-02 Schematic

Table B-10 describes the signals for the 99-000017-02 Photo Sensor, Visible, NPN, Light On, MS-Connect 210 Configuration.

TABLE B-10. Photo Sensor, Visible, NPN, Light On, MS-Connect 210 Configuration Pin Assignments

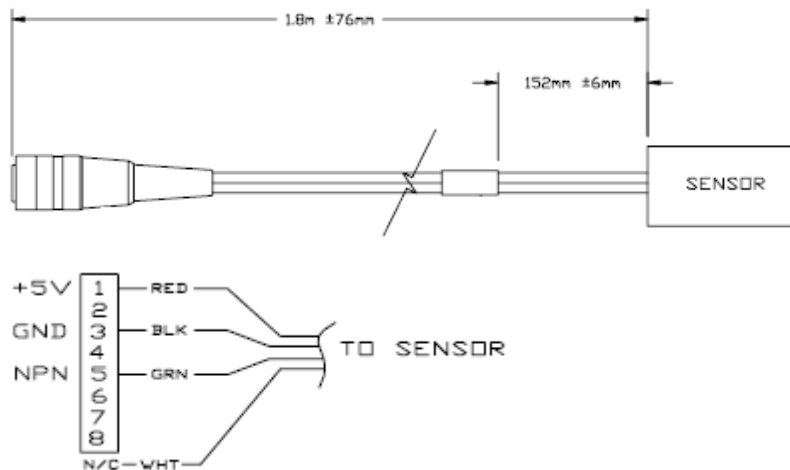
Pin	Function
1	+10-28V
2	NPN
3	Ground
4	+10-28V

99-000019-01 Photo Sensor, Visible, NPN, Light On, USB Configuration

The 99-000019-01 Photo Sensor, Visible, NPN, Light On, USB Configuration is an external trigger device with an 8-pin Micro-Change connector, intended for USB configuration.

Figure B-9 shows the 99-000019-01 Photo Sensor, Visible, NPN, Light On, USB Configuration.

FIGURE B-9. Photo Sensor, Visible, NPN, Light On, USB Configuration



99-000019-01 Schematic

Table B-11 describes the signals for the 99-000019-01 Photo Sensor, Visible, NPN, Light On, USB Configuration.

TABLE B-11. Photo Sensor, Visible, NPN, Light On, USB Configuration Pin Assignments

Pin	Function
1	+5V
3	Ground
5	NPN

General Specifications

This section contains specifications and dimensions for the Vision MINI Smart Camera.

TABLE C-1. General Specifications

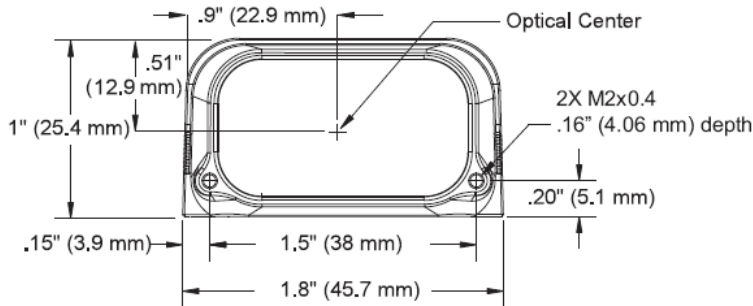
Part Number	GMV-6300-2110G	GMV-6300-2112G	GMV-6300-2210G	GMV-6300-2212G	GMV-6300-2172G	GMV-6300-2272G
Sensor	SXGA (1280 x 1024) CMOS				QXGA (2048 x 1536) CMOS	
Sensor Format	1/2"					
Sensor Color	Monochrome				Color	
Height	1" (25.4 mm)					
Width	1.80" (45.7 mm)					
Depth	2.10" (53.3 mm)					
Weight	2 oz. (57 g)					
Power	5VDC +/- 5%, 200 mV p-p max. ripple, 465 mA @ 5VDC (typ.), 4.5 watts (max.)				5VDC +/- 5%, 200 mV p-p max. ripple, 400 mA @ 5VDC (typ.), 4.2 watts (max.)	
Connector	3 ft. cable terminated with high density 15-pin D-sub socket connector and USB Type B socket connector					
Lens Type	Fixed Lens					
Comm.	USB					
Illumination	Built-In Red LEDs @ 617 nm				Built-In White LEDs	
Indicators	LEDs: Trigger, Pass, Fail, Mode, Power, Link/Act; Green Flash: Pass; Blue V: Target					
I/O	Trigger Input: 5 to 28VDC rated (.16 mA); Input 1: 5 to 28VDC rated (.16 mA); Outputs (1, 2, 3): 5V TTL compatible, can sink 10 mA and source 10 mA					
Image Acquisition	Progressive scan, square pixel					
Focal Range	2 to 6" (50.8 mm to 152.4 mm)					
Shutter	Software-adjustable, 10 microseconds to 1/60 seconds					
Pixel Size	5.2 um x 5.2 um				3.2um x 3.2um	

TABLE C-1. General Specifications (Continued)

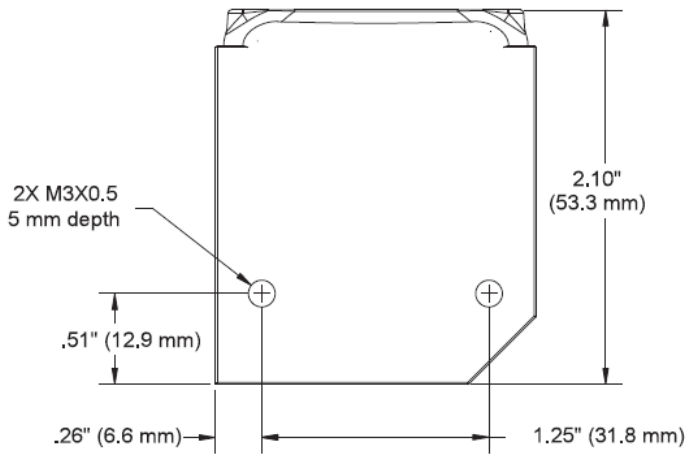
Operating Temperature	0° to 40° C (32° to 104° F)
Storage Temperature	-50° to 75° C (-58° to 167° F)
Humidity	Up to 90% (non-condensing)
Compliance	FCC, UL/cUL, CE (General Immunity for Light Industry: EN 55024:1998 ITE Immunity Standard; Radiated and Conducted Emissions of ITE Equipment: EN 55022:98 ITE Disturbances), CB

Dimensions

Front

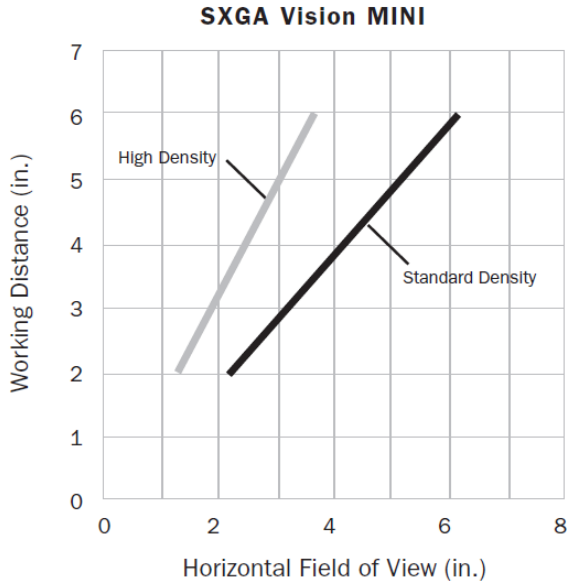


Base



Field of View and Working Distance

SXGA



QXGA

