MX-E90
Industrial Vision Processor

PRODUCT REFERENCE GUIDE

MX-E Series family
Support Gig-E multi-camera connectivity

DATALOGIC

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Patents

See www.patents.datalogic.com for patent list.

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PREFACE

ABOUT THIS MANUAL

This Product Reference Guide (PRG) is provided for users seeking advanced technical information, including connection, programming, maintenance and specifications. The Quick Reference Guide (QRG) and other publications associated with this product can be downloaded free of charge from the website listed on the back cover of this manual.

Manual Conventions

The following conventions are used in this document:

The symbols listed below are used in this manual to notify the reader of key issues or procedures that must be observed when using the reader:

Notes contain information necessary for properly diagnosing, repairing and operating the Industrial Vision Processor.

The CAUTION symbol advises you of actions that could damage equipment or property.

The WARNING symbol advises you of actions that could result in harm or injury to the person performing the task.

COMPLIANCE

European Declaration of Conformity

Hereby, Datasensing S.r.l. declares that the full text of the European Declaration of Conformity is available at: www.datasensing.com. Select the link from the downloads section of the product page.

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The CU Conformity certification has been achieved; this allows the Product to bear the Eurasian mark of conformity.

TECHNICAL SUPPORT

Support Through the Website

Datasensing provides several services as well as technical support through its website. Log on to (www.datasensing.com).

For quick access, from the home page click on the search icon, and type in the name of the product you're looking for. This allows you access to download Data Sheets, Manuals, Software & Utilities, and Drawings.

Reseller Technical Support

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Warranty

The warranty period for this product is 24 months. See General Terms and Conditions of Sales at www.datasensing.com for further details.

NOTES

CHAPTER 1
WHEN YOUR SYSTEM ARRIVES

Thank you for purchasing an MX-E90 embedded machine vision system (MX-E90 Industrial Vision Processor). *Please read the instructions in this document before starting your system setup.*

This manual explains the various parts of the MX-E90 system hardware, including the system inputs and outputs available to integrate your system into a production line.

When your system arrives, check the shipping cartons for wrinkled or damaged corners, holes through the cardboard, or other signs of rough handling or abuse. If you find any signs of damage, ask the delivery service to make a note on the delivery receipt describing the damage.

Carefully remove the system unit, cameras, cabling, and accessories from the shipping package. Place all equipment you unpack on a table and inspect each item. Report any damage to the carrier immediately. Save all packing materials so you can repack the shipment in case you need to move or ship it.

Temperature precautions: If your system arrives in very cold or hot weather, allow all the equipment to reach room temperature before plugging it in. Exposing a cold device to a warm room causes condensation that could damage the system if power is applied too soon. If condensation forms, wait for it to dry completely.

SYSTEM FACTORY SETUP

Before we shipped your MX-E90 vision system, we ran the installation and setup program and specified a default software and hardware configuration. See page 5 for more information about setting up the hardware. Refer to the Impact Reference Guide for software configuration information.

NOTE: A USB Hardware key is ordered and shipped separately from the Industrial Vision Processor. It must be present in the USB compartment on the Industrial Vision Processor front before the Industrial Vision Processor is powered on. (See "Front Panel Connections" on page 9 **and** "USB Hardware Key" on page 20**.)**

Industrial Vision Processor Front View

A USB Hardware key is ordered and shipped separately from the processor. It must be present in the USB compartment on the Industrial Vision Processor front before the Industrial Vision Processor is powered on.

Hardware Components

The major hardware components of the system are the MX-E90 Industrial Vision Processor, camera, and cables.

- For details about MX-E90 cables, see “Users can cancel the pending configuration by clicking the DISABLE button. No change to the system protection will be applied.” on page 93.
- For details about MX-E90 cameras, see “Camera Specifications” on page 30.

Safety Precautions

Seals: The Industrial Vision Processor has seals in some areas. The seals must not be broken or removed for any reason. The sealed parts may be opened only and exclusively by Datalogic. Breakage of these seals by a customer shall result in immediate cancellation of the warranty on the entire Industrial Vision Processor.

WARNING: There are no user-serviceable parts inside the hardware. To avoid electrical shock, never open the case. Modifying or tampering with internal components will void the product warranty.

Il n'y a aucune pièce réparable par l'utilisateur à l'intérieur du dispositif. Pour éviter un choc électrique, n'ouvrez jamais le cas. Toute modification ou manipulation des composants internes annulera la garantie du produit.

1. Read all of the following instructions before setting up your system. **Save this document for later use.**
2. Follow all warnings and instructions in this manual and in other user guides shipped with your hardware components.
3. To avoid damage to the vision system and its components, ***never*** plug in or unplug a cable when the power is on. Always shut down the Industrial Vision Processor and turn off the power supply before you make cable changes (see “Turning Off the System” on page 3).
4. Make sure the voltage of the power source is correct before connecting the MX-E90 to the power source.
5. MX-E90 should be used in environment with air flow.
6. MX-E90 should be placed in the right position: heatsink fins parallel to convection airflow direction with 0.7 m/sec air flow.
7. Never use the system if a power cable has been damaged. Do not allow anything to rest on a power cable and keep them away from traffic.
8. The air inlets and exhausts on the unit are for ventilation. Do not block or cover these openings or insert anything into these openings.
9. Do not expose the vision system to moisture, rain, or snow, and do not use it near water. If a component gets wet unplug it immediately.
10. If the MX-E90 is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
11. To avoid injury, never open the case. Modifying or tampering with internal components will void the product warranty.

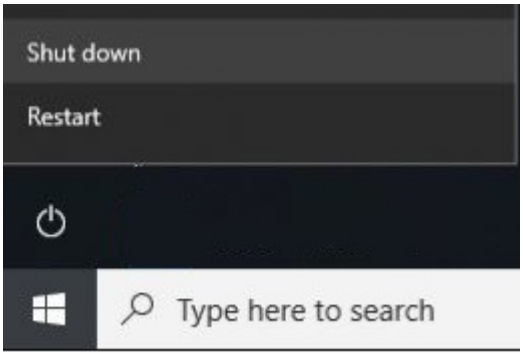
Turning Off the System

CAUTION: Turning off the Industrial Vision Processor power before stopping VPM and the Windows operating system can corrupt vision programs and other system files. For System Protection and Backup information see "Multilingual User Interface (MUI)" on page 96**. For information on System Restoration see** "System Restoration" on page 99**.**

Industrial Vision Processor Turn Off Procedure

1. If any cameras are online, turn them offline.
2. Close all open vision programs.
3. Disconnect VPM from any connected cameras.
4. Close VPM.
5. Click the Windows Start menu.

6. Click Shut down.



7. Wait approximately 30 seconds for the disk access and other Industrial Vision Processor functions to stop.
8. If the Industrial Vision Processor does not power off automatically, press and release the power button on the front of the Industrial Vision Processor (see "Front Panel Connections" on page 9).

INDUSTRIAL VISION PROCESSOR SPECIFICATIONS

This section lists the general operating specifications for MX-E90 Industrial Vision Processors. Only Datalogic GigE cameras will operate with MX-E90 Industrial Vision Processors. USB cameras cannot be used. Each of the M-Series cameras has different operating specifications. See "MX-E90 Cameras" on page 24 for details.

TECHNICAL DATA	
ELECTRICAL FEATURES	
Supply Voltage (Vs)	9 ~ 36VDC
Current Consumption	Nominal: 5.5 A at 24VDC Maximum: 23A at 9VDC; 6A at 36VDC
Digital Inputs	16 opto-isolated, see "Industrial Vision Processor I/O" on page 80
Input Voltage	Logic 0: 3V max Logic 1: 10V min (30V max) or dry contact.
Input Resistance	3.21k Ω

TECHNICAL DATA	
On Current	>3mA
Off Current	<1mA
Current Maximum	8.5 mA @30VDC
Isolation Protection	2500VDC
Optical Isolation Response time	100µs
Overvoltage protection	70 VDC
Load Voltage	5 ~ 40VDC (max)
Load Current	350mA (max per channel)
Input Current	3.28mA @ 12VDC 6.71mA @24VDC
Digital Outputs	16 opto-isolated configurable sinking (NPN) or sourcing (PNP), see digital I/O specifications, see "Industrial Vision Processor I/O" on page 80.
Format	Opto-coupler isolated open emitter output
Residual Voltage Output On	2V or less (output current ≤mA)
Optical Isolation response time	100µs
Camera Interface	GigE (up to 8 depending on the model)
USB Hardware Port	USB 2.0 Port for USB Hardware Key
USB Ports	8x USB 3.0 ports for monitor, mouse and keyboard
Graphic Interface	Intel® HD (1920x1200 resolution) VGA, DVI
Host Communications:	
Serial Communications	2x RS-232 Serial Port (COM 1 + COM 2)
Ethernet	10/100/1000 Mbps Ethernet x2 Ethernet/IP, Modbus, TCP, OPC, PROFINET communications supported.
Maximum POE power support	48 VDC PoE Power output, total Max. 18W (total Max. 60W)
PHYSICAL FEATURES	
Dimensions	7.55 w x 5.74 h x 9.05 d (in) 192 w x 145 h x 230 d (mm)
Weight	4450 g
Housing material	Metal
ENVIRONMENTAL FEATURES	
Temperature	Operating: 0° to +50° C (+32° to +122° F) Storage: - 20° to +70° C (-4° to +158° F)
Relative Humidity	5 to 95%, non condensing for storage.
Vibrations (EN60068-2-64)	Random: 5 to 500Hz 3g
Vibrations (EN60068-2-6)	Sine: Ramp to 2g from 5 to 15Hz 15 to 500Hz 2g
Shock resistance (EN60068-2-27)	Half sine: 11MS (50g Max)
Mechanical protection (EN 60529)	IP20
SOFTWARE FEATURES	

TECHNICAL DATA	
Minimum Impact Software Version Required	12.2.0
HARDWARE FEATURES	
CPU	Intel® Core i7
System Memory	DDR4 RAM 32GB.
Storage	128 GB SSD, 1 CFast slot.

SETTING UP THE SYSTEM

CAUTION: To avoid damage to your unit, *never* plug in or unplug any cables when the unit power is on. Always shut down the Industrial Vision Processor and turn off the power supply first before making any cable changes (see "Turning Off the System" on page 3).

NOTE: When a new Industrial Vision Processor is powered on the first time, a monitor, keyboard, and mouse must be connected to the Industrial Vision Processor to approve the license agreement.

1. Familiarize yourself with the major system components as shown in this manual.
2. Unpack and check all the equipment.
3. Mount the MX-E90 Industrial Vision Processor and power supply in their desired positions as indicated in the mounting instructions (see "" on page 14).

CAUTION: MX-E90 should be used in environment with air flow. MX-E90 should be placed in the right position: heat-sink fins parallel to convection airflow direction with 0.7 m/sec air flow.

4. Connect the I/O cable, optional monitor, and optional keyboard to the MX-E90 Industrial Vision Processor. Connect the I/O cable to the terminal block. When a new Industrial Vision Processor is powered on for the first time, a monitor, keyboard, and mouse must be connected to the Industrial Vision Processor to approve the license agreement.
5. Attach the appropriate lens for the application to the camera. Mount the MX-E90 camera, lighting, and optional power supply. See "Mounting the Camera" on page 41.

NOTE: Do not leave the camera imager uncovered. When you remove the lens cap, you must replace it with a lens.

6. Connect the camera to the Industrial Vision Processor GigE port using a Datalogic cable. See "Front Panel Connections" on page 9.
7. You are ready to wire the hardware. See "Industrial Vision Processor I/O" on page 80 for details about input/output schematics for the MX-E90. Wiring specifications for all cables are described in "System Protection Tool" on page 92.
8. Wire the MX-E90 camera's strobe and trigger connections to the camera's terminal blocks. See "Camera connection" on page 43.
9. Wire the MX-E90 Industrial Vision Processor power connector to the optional power supply. Wire AC power to the power supply. Connect the power supply plug

to the Industrial Vision Processor connector. See “Power Supply Connection” on page 19.

10. Connect the cables from the MX-E90 terminal blocks to their cameras.

NOTE: A USB Hardware key is ordered and shipped separately from the Industrial Vision Processor. It must be present in the USB compartment on the Industrial Vision Processor front before the Industrial Vision Processor is powered on. (See “System Factory Setup” on page 1 **and** “USB Hardware Key” on page 20**.)**

11. Plug the power supplies into an appropriate *grounded* power source. To protect your system, we recommend using a surge protector.

12. Turn on the MX-E90 Industrial Vision Processor power switch. Turn on the camera power supply.

NOTE: Default network IP addresses were assigned to the MX-E90 Industrial Vision Processor and Cameras at the factory. You will probably not need to change them unless there is a conflict with other devices on your network.

13. Start the Impact Software program Vision Program Manager and click on the Settings icon. Check your camera and lighting setup, calibrate the camera, configure your inspection parameters, then put the camera online. For more information about using Impact software, refer to the Impact Reference Guide.

If your system does not work when you have finished the setup, review the instructions and diagrams to make sure you made all connections properly.

Please note that Datalogic cannot guarantee the performance of MX-E90 which has additional software installed on it, including, but not limited to, anti-virus and firewall software. Datalogic recommends that MX-E90 remain disconnected from networks that access the Internet in order to minimize security risks. Datalogic will attempt to support systems with antivirus software installed, but we cannot guarantee system performance.

Remote Connection

It is possible to remotely connect to the MX System using a Microsoft Remote Desktop. This is done via a combination of the following Ethernet ports and IP addresses.

CONNECTIONS	IP ADDRESS
ETH1:	192.168.0.128
CAM1:	172.31.1.1
CAM2:	172.31.2.1
.....	.....
CAM8:	172.31.8.1

User ID: Impact

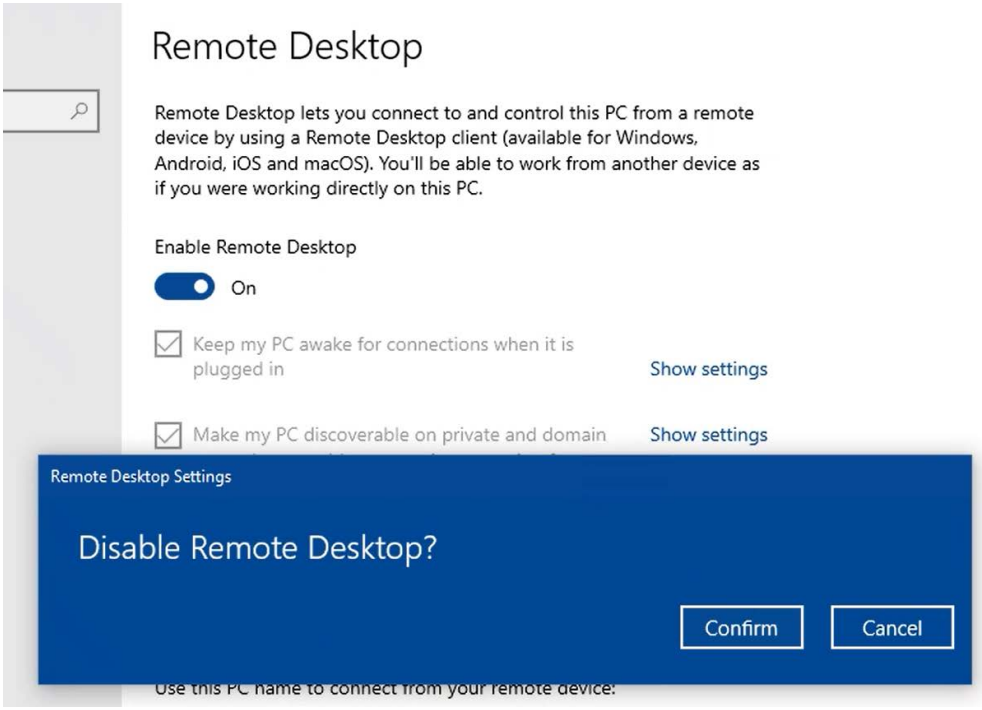
Password: 42,Vision

Disable Remote Connection

To protect the System from external access, it is possible to disable Microsoft Remote Desktop on the MX System as follows:

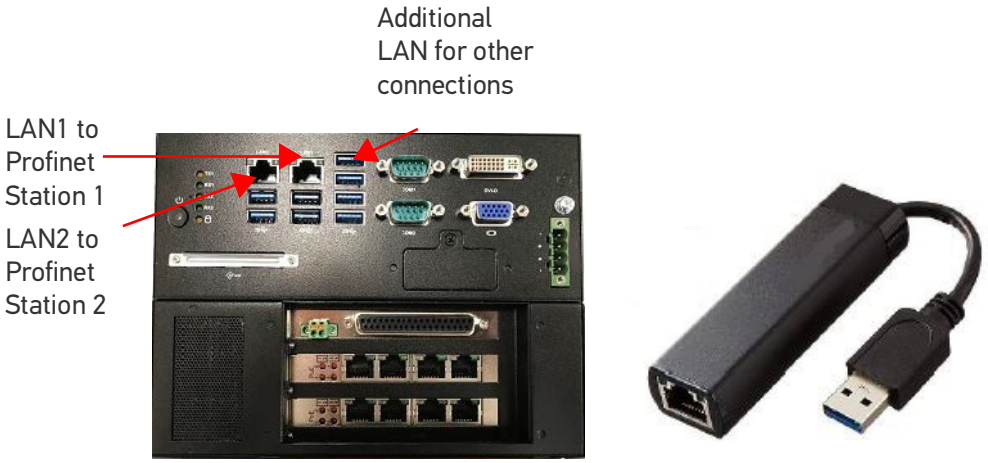
1. From the Start Menu

2. Enter: Remote Desktop Settings
3. Turn Enable Remote Desktop off
4. Confirm



PROFINET I/O: external port

This section refers only to MX-E90-8 model when more than 2 or 4 cameras are used. If LAN1 and LAN2 Ethernet ports are both used for ProfinetIO communications, it is possible to enable a third Ethernet port for other connections (e.g. external communications). Connect the USB to Ethernet adapter to one of the eight available USB 3.0 ports.



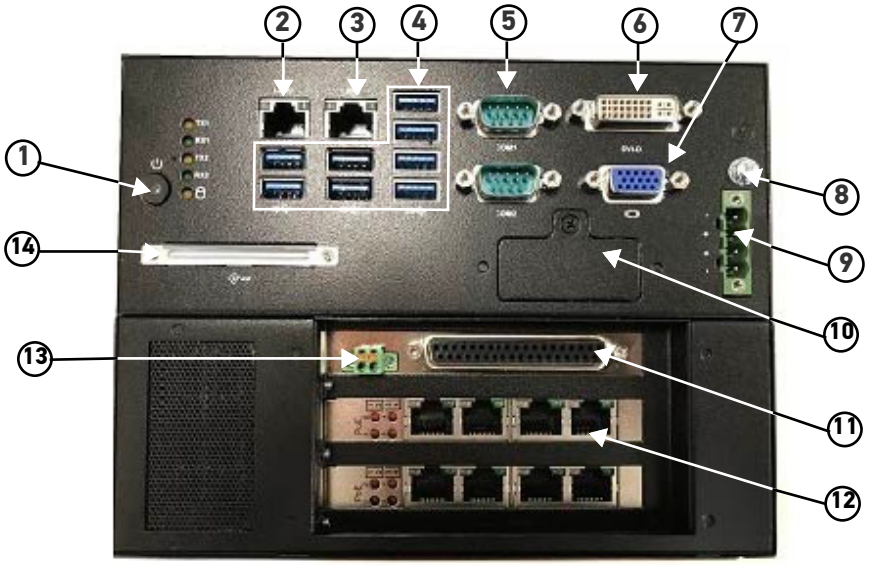
Impact Procedure

For more information about PROFINET see Impact Reference Guide (PROFINET and PROFINET Station sections).

GENERAL VIEW

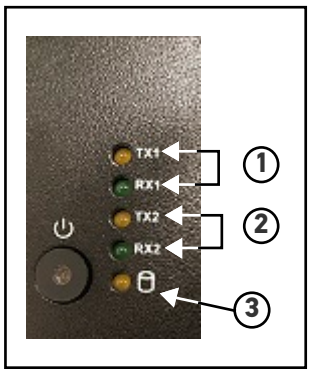
Front Panel Connections

This photo shows the connections on the Industrial Vision Processor's front panel.



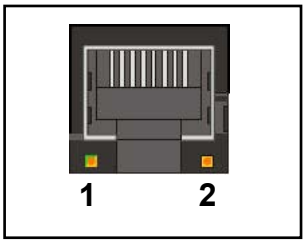
SYMBOL	FUNCTION
1	Power Button and status lights: see "Turning Off the System" on page 3, see "Status Lights" on page 10.
2	LAN1: 10/100/1000Mbps Base-T. Intel® I219LM
3	LAN2: 10/100/1000Mbps Base-T. Intel® i210IT.
4	USB 3.0 (x 8).
5	2X RS-232 Serial Port. (COM 1, COM 2). See "Serial Port" on page 90.
6	DVI: up to 1920 x 1080 maximum resolution @30Mhz.
7	VGA: 1 x DB15, up to 2048 x 1152 maximum resolution.
8	Chassis Ground
9	Power Connector
10	USB 2.0 compartment for USB Hardware Key.
11	37-pin D-Sub Digital I/O (See "Industrial Vision Processor I/O Connection" on page 81)
12	Camera Connectors Cam1 through Cam8 Cable 606-0677-xx (Also see "Status Lights" on page 10)
13	Extra Digital Output Grounding
14	CFast Slot. A CFast card can be used for extended storage. See "CFast Card" on page 21.

Status Lights



This illustration shows the status lights on the front of the Industrial Vision Processor.

SYMBOL	WHEN LIT INDICATES:
1	COM1: TX1/RX1 LED for date transmission status monitoring.
2	COM2: TX2/RX2 LED for data transmission status monitoring.
3	HDD LED for status monitoring.



This illustration shows the status lights for the two Ethernet connections on the top of the Industrial Vision Processor and the Cam1 through Cam2 GigE camera connections (MX-E90-2-B-2), the Cam1 through Cam4 GigE camera connections (MX-E90-4-B-2) or Cam 1 through Cam8 GigE camera connections (MX-E90-8-B-2).

SYMBOL	NAME	WHEN LIT INDICATES:
1	Activity/ Link	On: Link is established Blinking: Data is being transferred
2	Speed	Off: 10 Mbps Orange: 100 Mbps Green: 1000 Mbps (Gigabit)

This illustration shows the status lights for the Power Over Ethernet (PoE) indicators on the Ethernet card. Power is enabled/disabled in VPM - Settings - General.

NAME	WHAT LIGHT INDICATES:
PoE (Number corresponds to Cam Connector number)	On: Power is supplied to the camera over the Ethernet cable Off: Power must be supplied to the camera directly through a power cable

Preventive Maintenance

Seals: The Industrial Vision Processor has seals in some areas. The seals must not be broken or removed for any reason. The sealed parts may be opened only and exclusively by Datalogic. Breakage of these seals by a customer shall result in immediate cancellation of the warranty on the entire Industrial Vision Processor.

WARNING: There are no user-serviceable parts inside the device. To avoid electrical shock, never open the case. Modifying or tampering with internal components will void the product warranty.

Attention: Il n'y a aucune pièce réparable par l'utilisateur à l'intérieur du dispositif. Pour éviter un choc électrique, n'ouvrez jamais le cas. Toute modification ou manipulation des composants internes annulera la garantie du produit.

This section contains tips to keep your system trouble-free and operating smoothly.

- Use MX-E90 in an environment with air flow.
- MX-E90 should be placed in the right position: heatsink fins parallel to convection airflow direction with 0.7 m/sec air flow.
- Insure at least 1.5 inches (38.1 mm) of clearance on the sides and top of the MX-E90 Industrial Vision Processor.
- Periodically check mounting bolts for tightness and wear. The MX-E90 Industrial Vision Processor should be mounted securely in a vibration-free location.
- Keep the outside of the unit clean and free of oil and dust. Disconnect MX-E90 from any AC power before cleaning. You can clean the unit with a mild cleanser. *Do not* use an abrasive cleaner and *never* immerse the unit in water.
- Periodic cleaning of the air inlets, filters, and exhausts is highly recommended.
- Verify that all cable connections are correct and tight. Secure the cables to prevent accidents or damage to the device connectors.
- When you move the system, be careful that the movement does not loosen connections. After the system is moved, verify cable and power cord connections.
- Repair or replace frayed or damaged cables immediately.
- Do NOT attempt to clean the camera imager or imager cover. Do NOT spray the imager or imager cover with compressed air as this may leave spots.

Before You Call

If you have a problem with your system, contact your distributor or call Datalogic S.r.l. Before calling, however, review the installation to ensure you are not overlooking an obvious reason for the problem.

When you call for support, be prepared to answer to the following questions:

- What are the model and serial numbers of the device you are using? The model number is located on the rear panel and the serial number is located on the left side panel of the Industrial Vision Processor.
- Have you added, replaced, or reconfigured your hardware recently? This includes any changes to the camera or other components.
- What version of Impact Software you are running? Look on the title bar of one of the Impact Software components.
- Have you updated or replaced any software on your client computer lately?

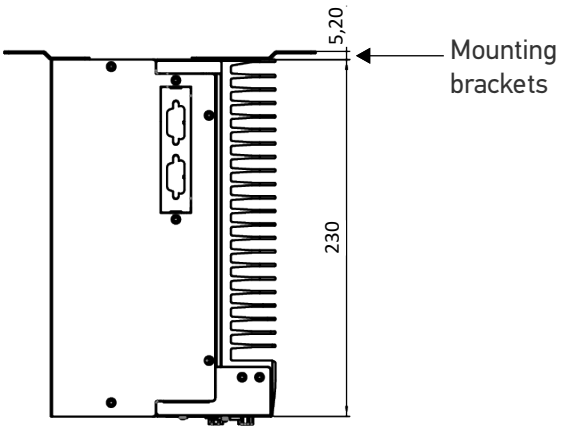
CHAPTER 2
BASIC HARDWARE COMPONENTS

INDUSTRIAL VISION PROCESSOR VIEWS AND DIMENSIONS

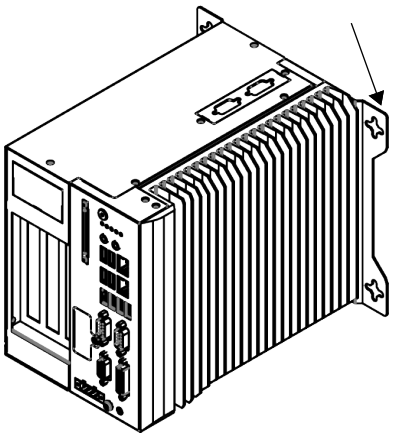
This section shows specifications for the Industrial Vision Processor, including various views and dimensions.

Processor Views and Dimensions: mounting brackets on the rear side

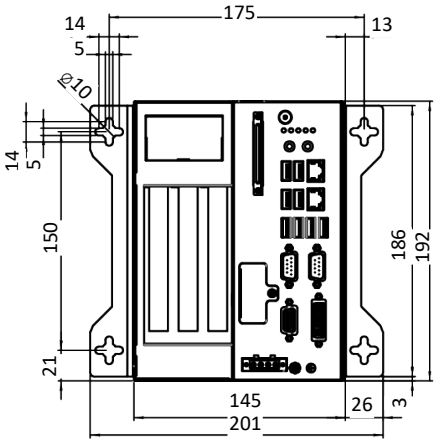
Top view



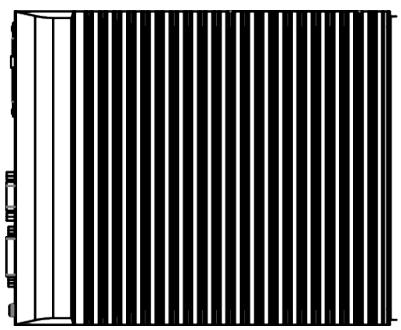
Mounting brackets on the rear side



Front view

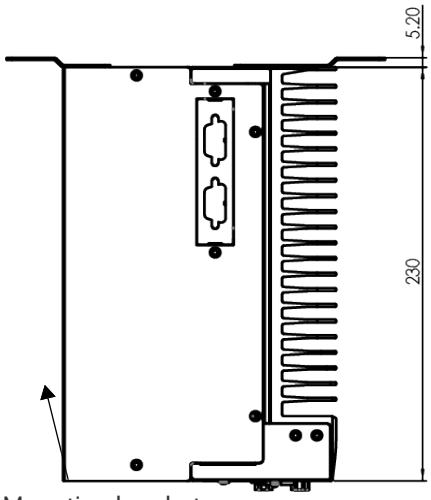


Side view



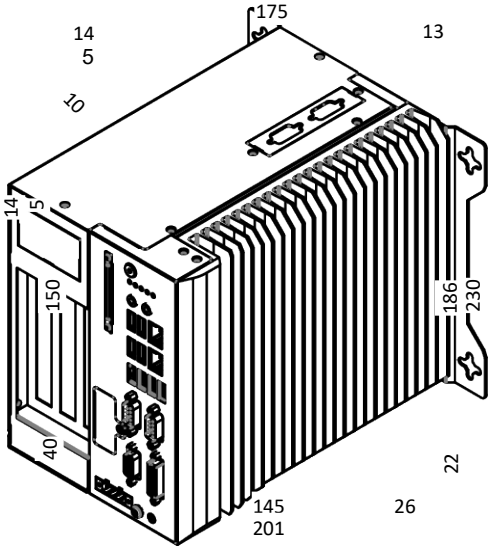
UNITS: mm

Processor Views and Dimensions: mounting brackets on the bottom side

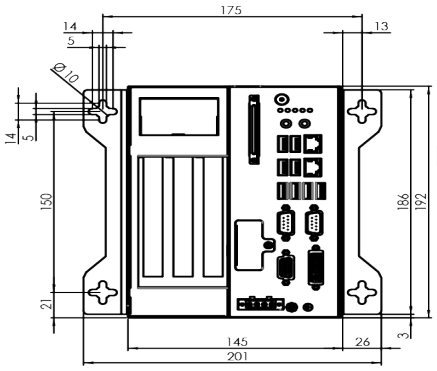


Mounting brackets on the bottom side

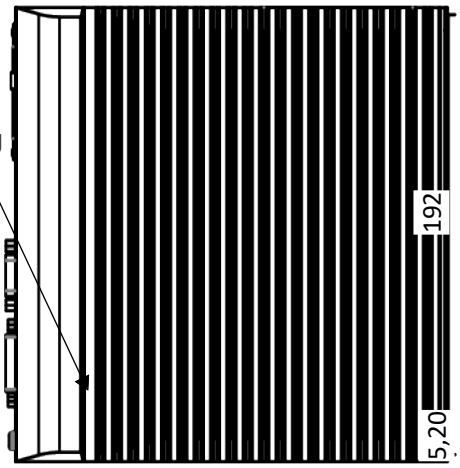
Top view



Side view



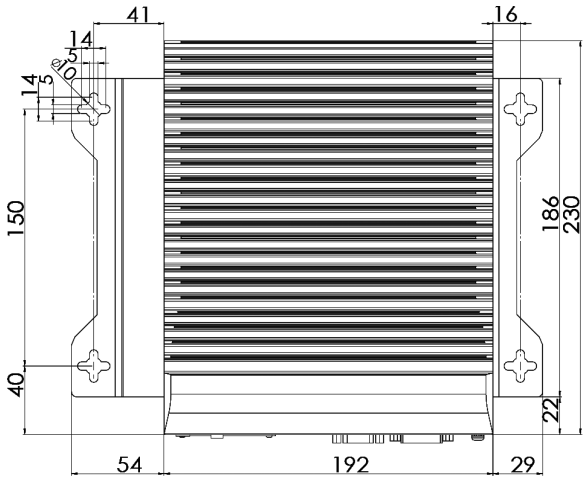
Front view

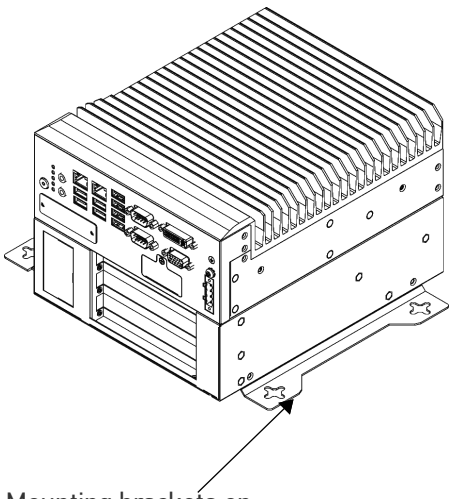


UNITS: mm

Processor Views and Dimensions: mounting brackets on the left side

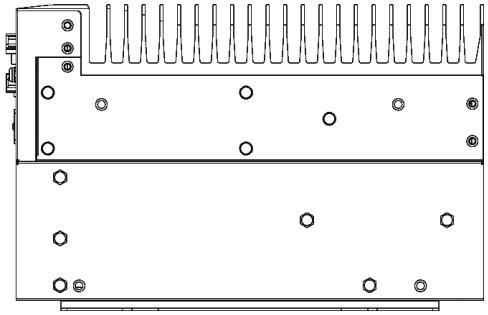
Side view



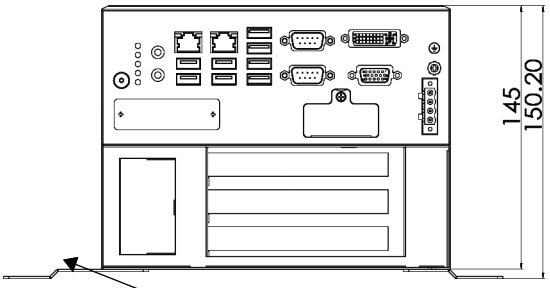


Mounting brackets on the left side

Side view



Front view



Mounting brackets

UNITS: mm

INDUSTRIAL VISION PROCESSOR INSTALLATION

Safety Instructions

Seals: The Industrial Vision Processor has seals in some areas. The seals must not be broken or removed for any reason. The sealed parts may be opened only and exclusively by Datalogic. Breakage of these seals by a customer shall result in immediate cancellation of the warranty on the entire Industrial Vision Processor.

WARNING: There are no user-serviceable parts inside the device. To avoid electrical shock, never open the case. Modifying or tampering with internal components will void the product warranty.

Il n'ya pas de pièces réparables par l'utilisateur à l'intérieur du matériel. Pour éviter un choc électrique, n'ouvrez jamais le boîtier. L'ouverture du boîtier ou le fait de retirer l'étiquette inviolable annulera la garantie du produit.

- Make sure heavy equipment is loaded evenly in the rack to avoid a hazardous condition. The rack should safely support the combined weight of all the equipment it supports.
- Before the system is connected to the supply circuit, be sure to check equipment nameplate ratings to avoid overloading circuits. Overloading may damage overcurrent protection devices and supply wiring.
- Use MX-E90 in an environment with air flow. MX-E90 should be placed in the right position: heatsink fins parallel to convection airflow direction with 0.7 m/sec air flow.
  Slots and openings in the cabinet are provided for ventilation. To ensure sufficient air circulation for reliable system operation, and to prevent overheating, maintain a minimum of 1.5 inches (38.1 mm) of clearance on the top and sides of the cabinet and between MX-E90 Industrial Vision Processor.
  An optional power supply is available for MX-E90. If you provide your own, it must supply 9 ~ 36VDC with a safe operating ambient temperature range of 0° to +50° C (+32° to +122° F).
  MX-E90 should be in a controlled environment.
  This equipment is to be powered by a Listed power supply for the U.S. and Canada, or a power supply that meets the requirements for use where either IEC 60950 or EN60950 is applicable.
- To ensure safe operation, the system power must be properly grounded. If the unit is mounted within a rack, verify that it is reliably connected to electrical ground. The ground terminal on the power input must be connected to the grounded chassis/enclosure of the power supply. This ensures electromagnetic compliance and proper operation. See “Grounding Concepts” on page 19.
- The Industrial Vision Processor is to be connected only to networks that do not route outside the plant.

Mounting procedure

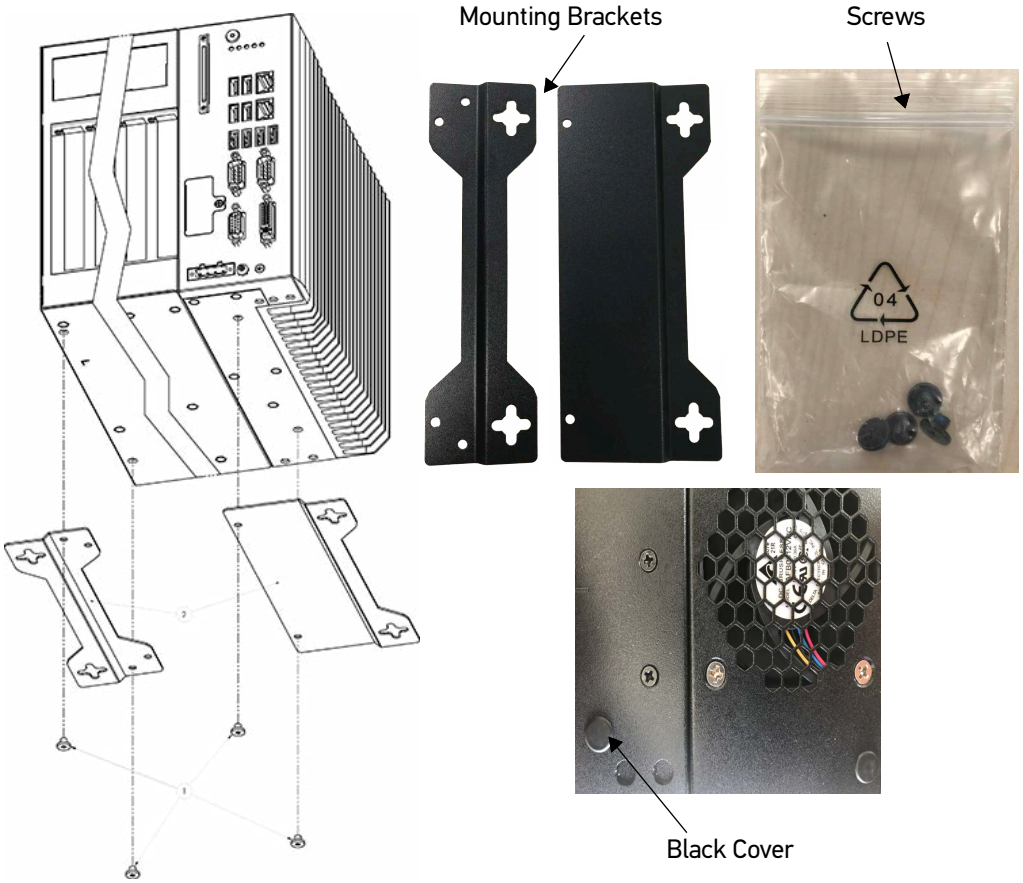
When mounting the MX-E90 Industrial Vision Processor:

- Take environmental conditions into consideration. See “Safety Instructions” on page 15.
- Mount the Industrial Vision Processor to a flat, stable, vibration-free surface.
- This Industrial Vision Processor is only certified for operation in closed rooms.
- Do not subject the Industrial Vision Processor to direct sunlight.
- Do not cover the ventilation holes.

- The wall or control cabinet must be able to withstand four times the total weight of the industrial visual Industrial Vision Processor.
- Do not exceed the flex radius of any connected cables.

To mount the mounting brackets

1. Choose the mounting surface among the possible sides (with four mounting black covers), see also “Industrial Vision Processor Views and Dimensions” on page 12
2. Take the mounting brackets and screws from the mounting kit inside the accessory box.
3. Mount the brackets with 4 screws (4x10mm).



To mount the Industrial Vision Processor:

1. Mark the surface mounting holes in the desired location.
2. Take 4 appropriate Ø5mm screws. The mounting screws must be long enough to provide sufficient support.
3. Drill four surface mounting holes in the mounting surface.
4. Insert the 4 screws through the mounting holes in the mounting surface and tighten them.

Mounting Positions

CAUTION: To prevent overheating, maintain a minimum of 1.5 inches (38.1 mm) of clearance between the cabinet and the MX-E90 Industrial Vision Processor.

Position 1

Position 2

Position 3

POWER SUPPLY CONNECTION

WARNING: To avoid electrical shock, disconnect all power to the power supply before working on it.

Pour éviter un choc électrique, débranchez votre source d'alimentation avant de commencer à travailler.

This equipment is to be powered by a Listed power supply for the U.S. and Canada, or a power supply that meets the requirements for use where either IEC 60950 or EN60950 is applicable.

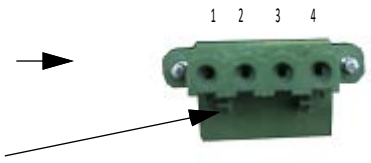
Wire the supplied power plug according to the illustration shown below, then plug it into the power connector on the front of the Industrial Vision Processor. The Chassis Ground must be connected to the Control Cabinet/enclosure. This connection is needed to ensure electromagnetic compliance and proper operation. See also "Grounding Concepts" on page 19.

SLOT NUMBER	SIGNAL NAME
1,4	24 VDC Supply Minus
2,3	24 VDC Supply Plus

SUPPLIED POWER PLUG

Insert stripped wire into this hole

To open, insert a small screwdriver into this slot and push down gently on the screwdriver handle



Industrial Vision Processor Power Connector on front of the Industrial Vision Processor

Connect Chassis Ground to the control cabinet.

Connect V- terminal to Power Supply Minus

Connect V+ terminal to Power Supply Plus*

NOTE: It is advised to use all 4 pins for power connection. The Industrial Vision Processor requires 24VDC±25%. This voltage is commonly used in many manufacturing environments.

The supply voltage is protected internally by a fuse on the power board.

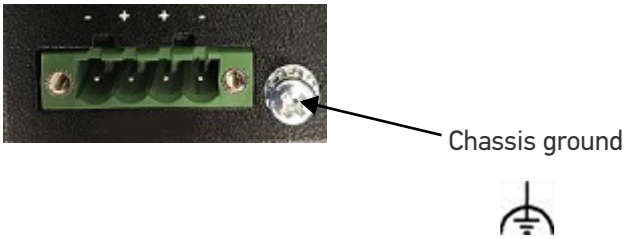
Opening time:

- **30A 4 hours, minimum**
- **60A 60 seconds, maximum**

Grounding Concepts

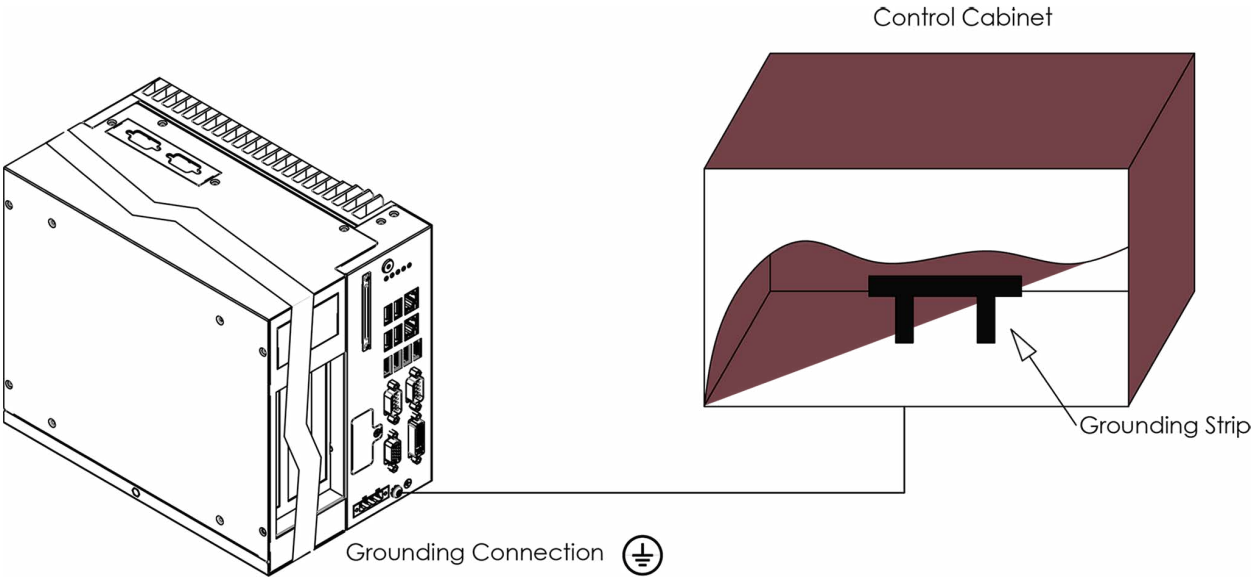
Functional ground is a low impedance current path between electrical circuits and ground. It is used, for example, to improve immunity to disturbances, but is not a protective measure. Grounding deflects disturbances, but does not necessarily provide protection against electric shock.

The functional ground on the Industrial Vision Processor is the Chassis Ground terminal.



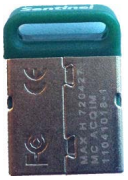
To guarantee a good functional ground:

- Connect the Industrial Vision Processor Chassis Ground to the grounding point in the control cabinet using the shortest route possible.
- Use a cable with a minimum cross section of 2.5 mm² per connection. If a cable with wire tip sleeves is connected to the supplied power plug, then a cable with maximum 1.5 mm² per connection is possible.
- Use shielded cable for all data connections



USB HARDWARE KEY

A USB Hardware key, which contains license and Industrial Vision Processor configuration information, is ordered and shipped separately from the Industrial Vision Processor. It must be present in the USB 2.0 port on the Industrial Vision Processor front before the Industrial Vision Processor is powered on.



The USB Hardware key
18 x 12 x 5 mm.

To mount the USB Hardware Key

1. Unscrew the USB slot cover
2. Insert the USB key into the port.

3. Close the slot cover.

Industrial Vision Processor Front View

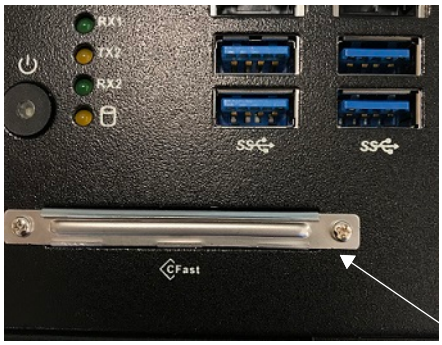
A USB Hardware key is ordered and shipped separately from the Industrial Vision Processor. It must be present in the USB port on the Industrial Vision Processor front before the Industrial Vision Processor is powered on.

CFAST CARD

A CFast slot is located in the Industrial Vision Processor front panel. A CFast card can be used as removable media for transferring data, performing upgrades, or for extended storage.

WARNING: Power must be disconnected before inserting or removing the CFast card.

Industrial Vision Processor Front View



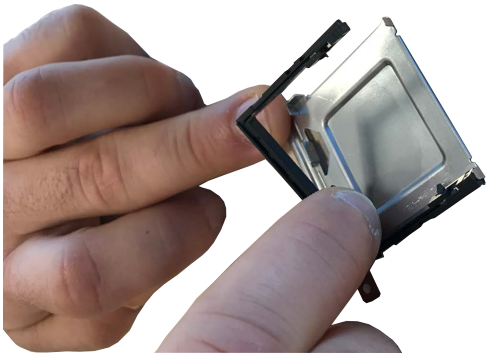
CFast Slot cover

To insert the CFast card

1. Unscrew to open the CFast card slot cover

2. Gently pull the tray straight out.

3. Remove the protective plastic.



4. Gently place the new card onto the slot tray.

5. Insert the slot tray until you feel lock into place and then tighten the cover screws.

CHAPTER 3
MX-E90 CAMERAS

INTRODUCTION

This section describes digital cameras provided by Datalogic S.r.l. and other third-party manufacturers. USB cameras will not operate on an MX-E90 Industrial Vision Processor.

Datalogic S.r.l. does not support the use of these cameras in any manner other than described herein.

E-Series cameras acquire an image when a signal is present on the trigger input of the camera trigger/power cable, then digitize images at the camera source and transmit them directly to the Industrial Vision Processor over the Ethernet cable. These cameras provide 8-bit resolution using internal 12-bit A/D converters. Third-party cameras may have different specifications. All cameras are capable of Gigabit transmission rates.

E-Series cameras have a hard-coat finish case that helps eliminate ground loops. All camera settings (shutter, strobe, partial scan, etc.) and training are configured using Vision Program Manager (VPM) and are maintained in the MX-E90 Industrial Vision Processors' memory so there are no physical switches on the cameras.

All camera settings must be configured using the Settings icon in the Vision Program Manager (VPM). For more detailed information, refer to the Impact Reference Guide.

NOTE: We recommend that the sum of the pixel resolution of all the cameras connected to an MX E-90 Industrial Vision Processor with 32G of RAM not exceed 128 Mbyte. This limit is not enforced by the Vision Device, but, if the limit is exceeded, the VPM user interface performance will degrade.

SAFETY PRECAUTIONS

Read all of the following instructions before setting up your camera. Save this document for later use.

- Follow all warnings and instructions in this manual and in other user guides shipped with your hardware components.
- Do not attempt to disassemble the camera. Do not remove screws or attachments. There are no user-serviceable parts inside. Refer servicing to Datalogic S.r.l.
- All E-Series and third-party cameras connect to the MX-E90 Industrial Vision Processor using a Cat5E Ethernet cable (606-0677-xx). Cat6 cable is required for distances greater than 25 meters. Using any other cable may cause intermittent data

transmission. Cameras connect to power and triggering signals using a cable and terminal block. See “Camera connection” on page 43 for more details.

NOTE: We recommend that you do not use a switch or a router between the MX-E90 Industrial Vision Processor and the camera.

- This camera is designed for indoor use. Do not expose it to moisture, including rain or snow, and avoid operating it in wet areas. Should the camera become wet, turn off the power immediately. Moisture can damage the camera and create danger of electric shock. Avoid using the camera when the humidity is above 80%.
- Make sure your camera has enough airflow around it for proper ventilation. The safe case temperature during operation is from 0° to 50° C (32° to 122° F).
- Mount the camera body in a fixed position where it will not be subject to excessive vibration.
- To reduce stress on the camera connectors and cable, loop the cables and fasten them to the camera's mounting block. Do not crimp or tie the cables tightly with wire ties as this may damage them internally. The minimum cable bend radius is fifteen times the cable diameter. It is not intended for continuous flexing or movement. Be sure that cables are safely routed away from vehicle and pedestrian traffic.
- Check the intended installation area to be sure there is enough room for the camera and any lighting that may be needed.
- Avoid areas with excessive heat, vibration, and environmental contaminants.
- Mount the camera away from devices that emit large amounts of electromagnetic energy.
- Do NOT attempt to clean the camera imager or imager cover. Do NOT spray the imager or imager cover with compressed air as this may leave spots.
- Do not leave the camera imager uncovered. When you remove the lens cap, you must replace it with a lens.

CAMERA BASICS

Rolling Shutter Cameras support

(M197, M197C)

Stationary objects

When imaging stationary objects, you can use static lighting and set the strobe trigger width to 0. The camera will operate in a rolling shutter mode, which means that each row starts exposure at a different time, but is exposed for the same amount of time. If the object is moving, the rolling shutter causes a “shearing” effect in the image. For a stationary object, the rolling shutter has no ill effects.

Moving objects

When imaging moving objects, you **must** use strobed lighting. You must set the “Strobe Pulse Width” to a non-zero value and set the shutter open time to be longer than the strobe pulse length. Ambient light should be minimized. The camera will operate in “Global Reset Release” mode, which means that all rows will start exposure simultaneously, but, due to the rolling shutter architecture, the bottom rows will be exposed longer than the top rows. Using strobed lighting negates the effect of the different exposure times. Static or ambient light will cause the lower rows of the image to be brighter and therefore should be minimized.

High Resolution (20+ MPX) Cameras support

The table below shows the maximum recommended number of cameras to use and the Program Memory settings. The default program memory value is 800 MB.

For more details about the Program Memory see Impact Reference Guide.

CAMERA TYPE	NUMBER OF CAMERAS	MINIMUM PROGRAM MEMORY SETTING FOR VPM - CPM	
20/24 MPX Monochrome	1	800 MB	800 MB
	2	1500 MB	1500 MB
	3	2300 MB	1500 MB
	4	2500 MB	1500 MB
20 MPX Color	1	3500 MB	1600 MB
	2	4500 MB	2500 MB
24 MPX Color	1	4600 MB	1800 MB
	2	5600 MB	2800 MB

Color shading support

(JAY AT-200GE)

The JAI Model AT-200GE camera has several special features that are not supported by the standard VPM camera setup. One of these features is color shading. Color shading corrects for image shading, particularly darkening in the corners. You can use the color shading feature of this camera after you complete the following offline calibration procedure.

To calibrate color shading

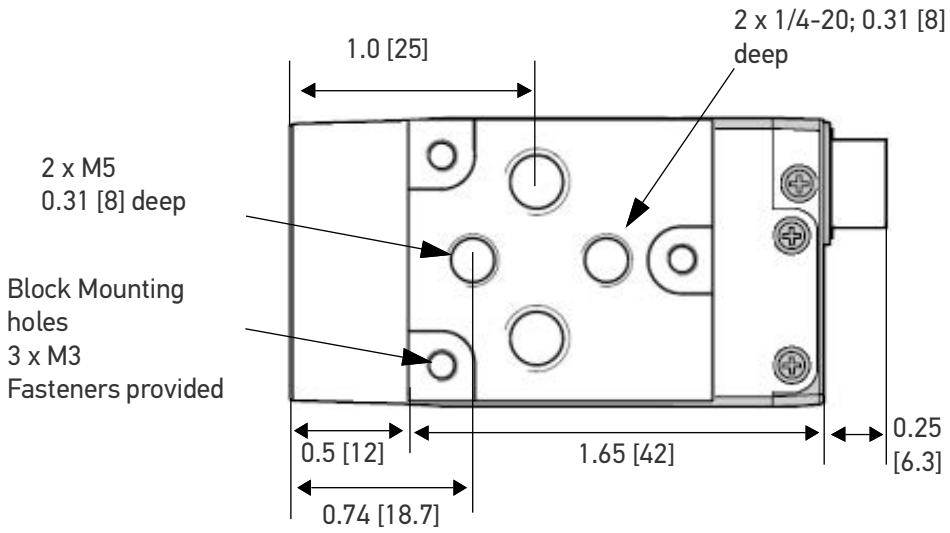
1. Using the optics and lighting for the application, place a white or gray target that fills the field-of-view.
2. Using VPM camera settings, set the white balance to factory defaults. You should re-calibrate the white balance after the shading is corrected.
3. Adjust the exposure and other settings to create a grey level of 50 to 75% at the center of the image. Note the exposure setting.
4. Close VPM and IMPACTDevice.exe.
5. Start the Pylon Viewer by double-clicking on the following file: c:\Program Files\Basler\Pylon 2.x\apps\i386\PylonViewerApp.exe
   Note that Pylon Viewer and IMPACTDevice.exe cannot run at the same time.
6. In the Devices window, select the camera to be calibrated.
7. Switch to the Feature window.
8. Set the Transport Layer/Read Timeout and the Write Timeout to 3000.
9. Set the User Set Selector to Default and click the User Set Load button.
10. Set the Acquisition Control/Exposure Mode to Timed.
11. Set the Acquisition Control/Exposure Time to the setting found in Step 3 using VPM.
12. Snap and image using the One Shot button. An image should be displayed.

13. Verify that the image pixel values are medium intensity, not saturated or very dark. Adjust the exposure time and other settings, if necessary.
14. Move to the JAI Custom Control area of the Feature Window.
15. Select the preferred Shading Correction Mode. You will probably want Flat Shading, which corrects for both brightness variations and color variations. The other option of Color Shading will only correct for color variation and leaves brightness variation uncorrected.
16. Set Shading Selector to Red.
17. Turn On Shading Enable.
18. Click the Shading Correct Execute button.
19. Repeat steps 16, 17, and 18 for Green and Blue.
20. In the User Set Control area, set User Set Selector to User Set 1 and click the User Set Save button.
21. Close the Pylon Viewer and restart IMPACTDevice.exe and VPM.
22. The camera will now load the shading correction each time it starts.
23. Recalibrate the White Balance.

CAMERA DIMENSIONS

M1xx and E1xx

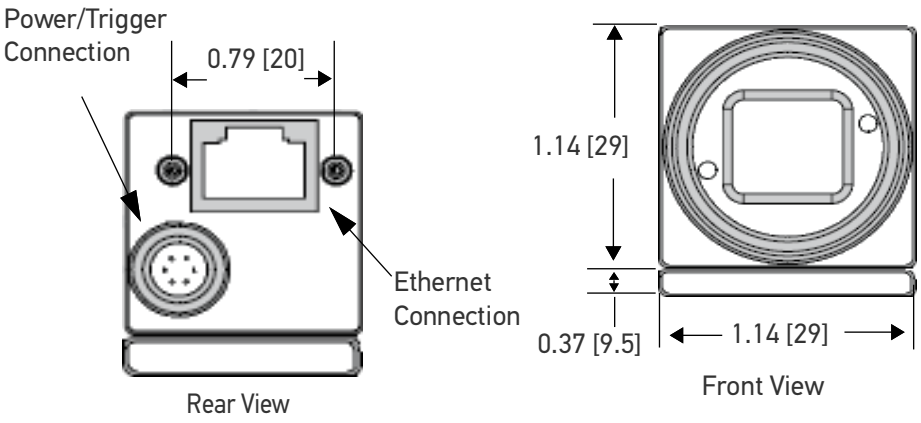
These cameras weighs approximately 4 ounces (112 grams) with a mounting block, but without a lens.



Mounting Block (95A903029) and Camera Body
Bottom View

UNITS: inch [mm.]

(also see "Mounting Block (95A903029)" on page 41)

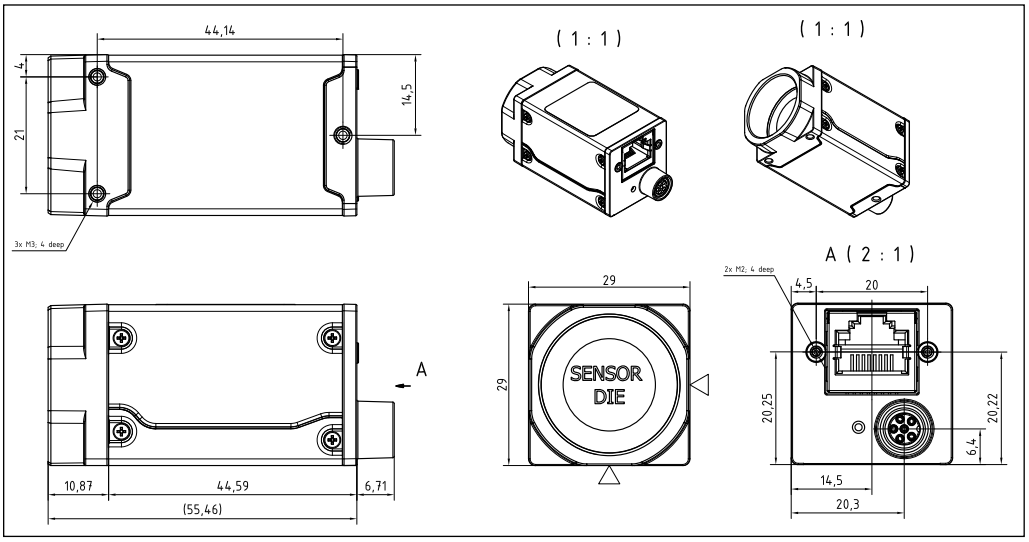


Rear View

Front View

E2-xxx

These cameras weighs approximately 3,2 ounces (90 grams) without mounting block and and lens.

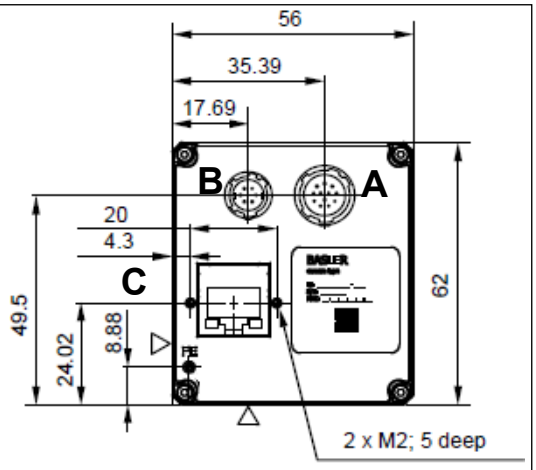


M565/M570/M575/M580

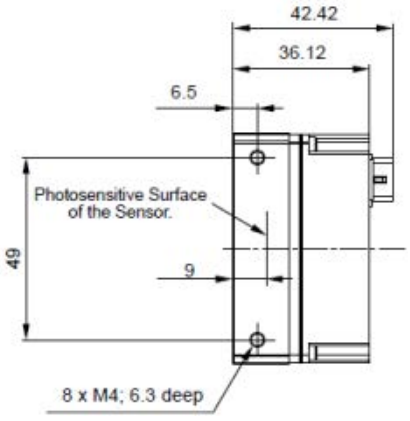
The camera weigh approximately 8 ounces (240 grams) without a lens. With an F-mount lens adapter the weight is approximately 11.6 ounces (330 grams).

A = I/O Connection
B = Power Connection
C =Ethernet Connection
Green LED = Connection Active
Yellow LED = Data Transfer

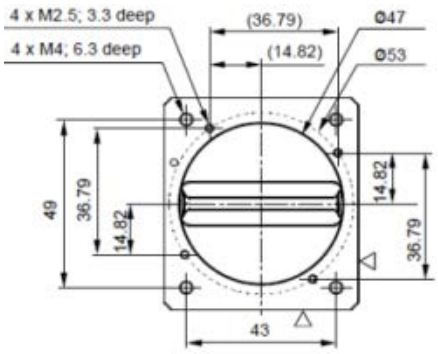
UNITS: mm.



Rear View



Bottom View



Front View

CAMERA SPECIFICATIONS

E-Series

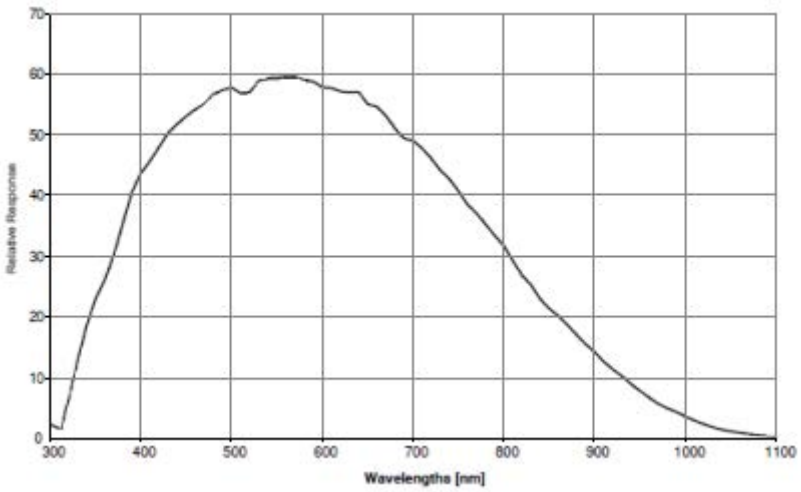
E1xx, E1xxC

All E1xx cameras have the following specifications. Model numbers that end in “C” are color cameras.

E1XX COMMON SPECIFICATIONS	
Lens Mount	C mount
Cabling	Camera cable provides trigger. Ethernet cable transmits video and provides POE.
Operating Environment	Temperature: 0 to +50 C (+3 to 122 F) Humidity: 0 to 90% (non-condensed)
Vibration	5g (11 to 200 Hz)
Power	Provided by Power Over Ethernet
Weight	3.2 ounces (~90 g)

E101, E101C

This camera captures a 640 x 480 pixel size image with square pixels. It can partially scan the image horizontally and vertically.

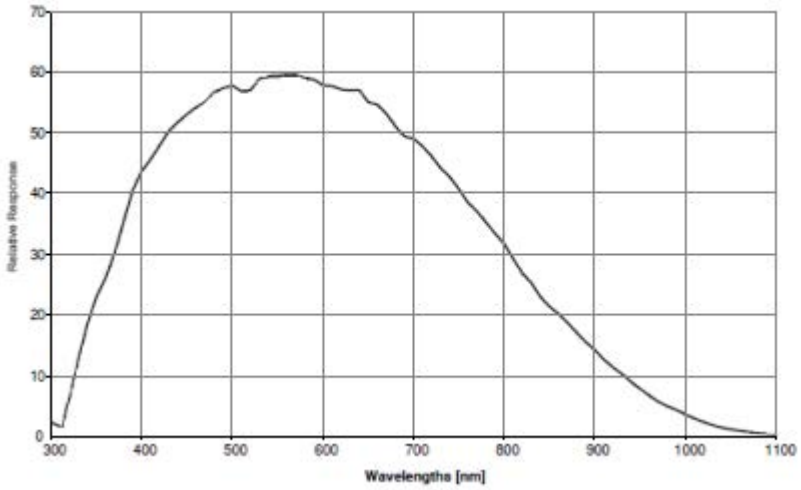


E101 Spectral Response (excludes lens and light source characteristics)

E101 SPECIFICATIONS	
Part Number	959933022; 959933023
Pick-up Device	Global Shutter CMOS - 640 (H) x 480 (V) pixels
Sensor Size	1/4" (3.8 mm) diag - 3.07mm (H) × 2.3mm (V)
Capture Rate	376 full-resolution fps; higher with partial scan
Pixel Size	4.8 x 4.8 micrometers
Gain	100% to 1023%
Shutter Open	112 to 1,000,000 microseconds
Software Version	Impact Software Release 11.8.0.97 or greater

E151, E151C

This camera captures a 1280 x 1024 pixel size image with square pixels. It can partially scan the image horizontally and vertically.

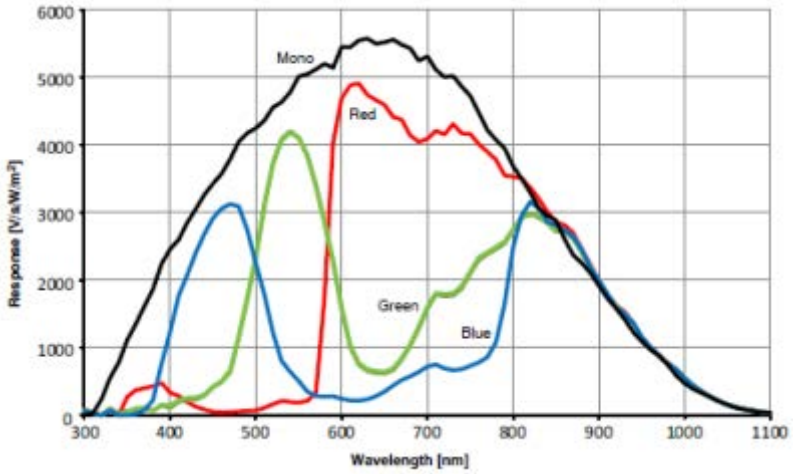


E151 Spectral Response (excludes lens and light source characteristics)

E151 SPECIFICATIONS	
Part Number	959933024; 959933025
Pick-up Device	Global Shutter CMOS - 1280 (H) x 1024 (V) pixels
Sensor Size	1/2" (8 mm) diag - 6.14mm (H) × 4.92mm (V)
Capture Rate	88 full-resolution fps; higher with partial scan
Pixel Size	4.8 x 4.8 micrometers
Gain	100% to 1023%
Shutter Open	80 to 1,000,000 microseconds
Software Version	Impact Software Release 11.8.0.97 or greater

E181, E181C

This camera captures a 1920 x 1200 pixel size image with square pixels. It can partially scan the image horizontally and vertically.



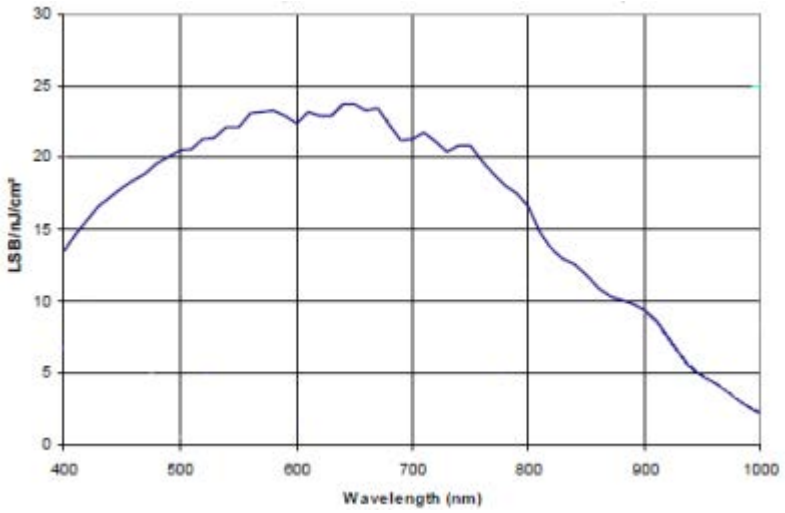
E181 Spectral Response (excludes lens and light source characteristics)

E181 SPECIFICATIONS	
Pick-up Device	Global Shutter CMOS - 1920 (H) x 1200 (V) pixels

E181 SPECIFICATIONS	
Sensor Size	2/3" (11 mm) diag - 9.2mm (H) × 5.8mm (V)
Capture Rate	50 full-resolution fps; higher with partial scan
Pixel Size	4.8x 4.8 micrometers
Gain	100% to 1023%
Shutter Open	137 to 1,000,000 microseconds
Software Version	Impact Software Release 11.12.0 or greater

E182, E182C

This camera captures a 1600 x 1200 pixel size image with square pixels. It can partially scan the image horizontally and vertically.

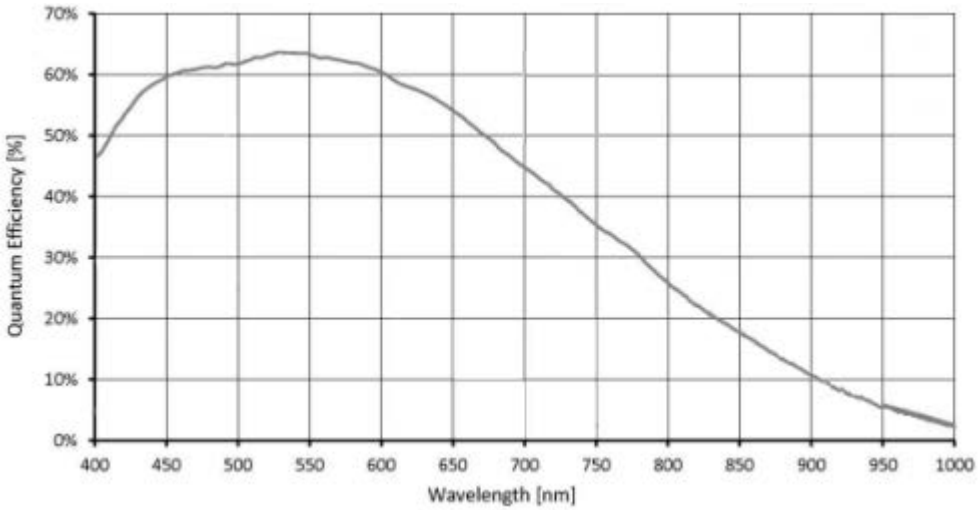


E182 Spectral Response (excludes lens and light source characteristics)

E182 SPECIFICATIONS	
Part Number	959933038; 959933039
Pick-up Device	Global Shutter CMOS - 1600 (H) x 1200 (V) pixels
Sensor Size	1/1.8" (8 mm) diag - 7.2mm (H) × 5.4mm (V)
Capture Rate	60 full-resolution fps; higher with partial scan
Pixel Size	4.5 x 4.5 micrometers
Gain	1 to 3
Shutter Open	10 to 840,000 microseconds
Software Version	Impact Software Release 11.8.1 or greater

E193, E193C

This camera captures a 2048 x 1536 pixel size image with square pixels. It can partially scan the image horizontally and vertically.

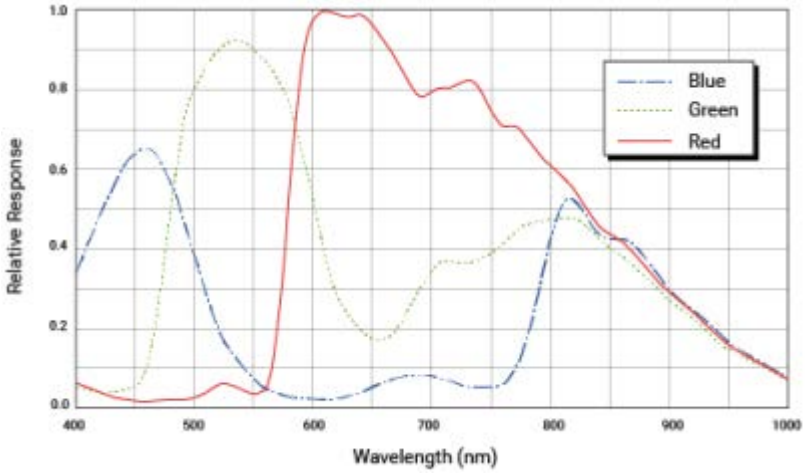


E193 Spectral Response (excludes lens and light source characteristics)

E193 SPECIFICATIONS	
Part Number	959933042; 959933043
Pick-up Device	Global Shutter CMOS - 2048 (H) x 1536 (V) pixels
Sensor Size	1/1.8 (8.9 mm) diag - 7.07mm (H) × 5.30mm (V)
Capture Rate	36 full-resolution fps; higher with partial scan
Pixel Size	3.45 x 3.45 micrometers
Gain	0 to 360
Shutter Open	26 to 1,000,000 microseconds
Software Version	Impact Software Release 11.10.0.70 or greater

E198, E198C

This camera captures a 2448 x 2048 pixel size image with square pixels. It can partially scan the image horizontally and vertically.



E198C Spectral Response (excludes lens and light source characteristics)

E198 SPECIFICATIONS	
Part Number	959933044; 959933045
Pick-up Device	Global Shutter CMOS - 2448 (H) x 2048 (V) pixels

E198 SPECIFICATIONS	
Sensor Size	2/3" (11.1 mm) diag - 8.4 mm (H) x 7.1 mm (V)
Capture Rate	22.7 full-resolution fps; higher with partial scan
Pixel Size	3.45 x 3.45 micrometers
Gain	100% to 1023%
Shutter Open	28 to 1,000,000 microseconds
Software Version	Impact Software Release 11.10 or greater

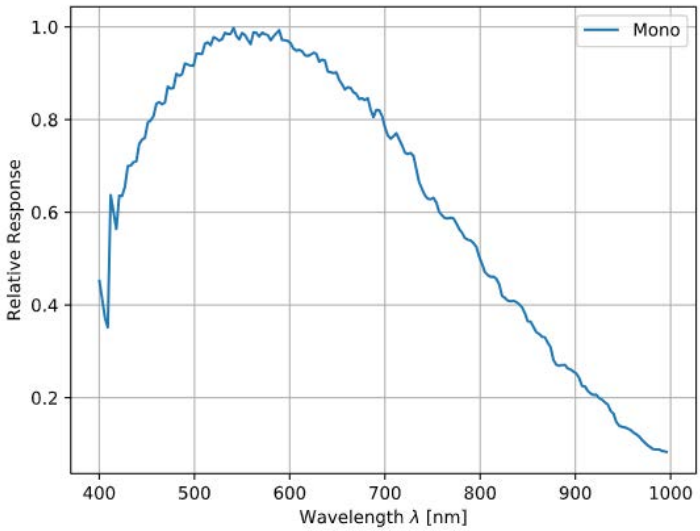
E2-xxx, E2-xxxC

All E2-xxx cameras have the following specifications. Model numbers that end in "C" are color cameras.

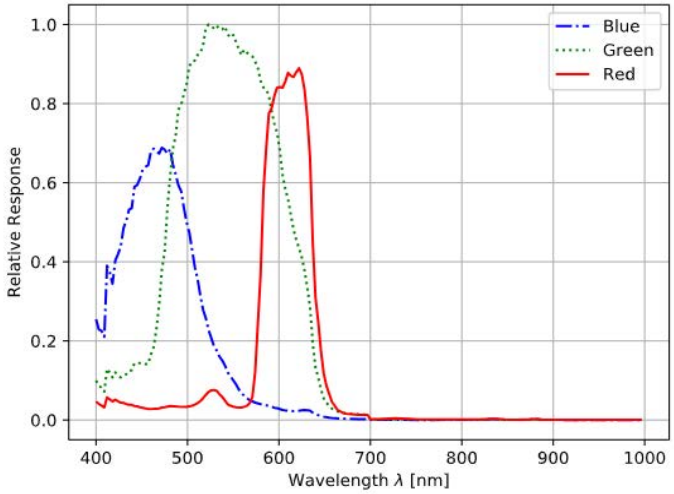
E2-XXX COMMON SPECIFICATIONS	
Lens Mount	C mount
Cabling	Camera cable provides trigger. Ethernet cable transmits video and provides POE.
Operating Environment	Temperature: 0 to +50 C (+3 to 122 F) Humidity: 0 to 90% (non-condensed)
Vibration	5g (11 to 200 Hz)
Power	Provided by Power Over Ethernet
Weight	3.2 ounces (~90 g)

E2-123, E2-123C

This camera captures a 4096 by 3000 pixel size image with square pixels. It can partially scan the image horizontally and vertically.



E2-123 Spectral Response (excludes lens characteristics)

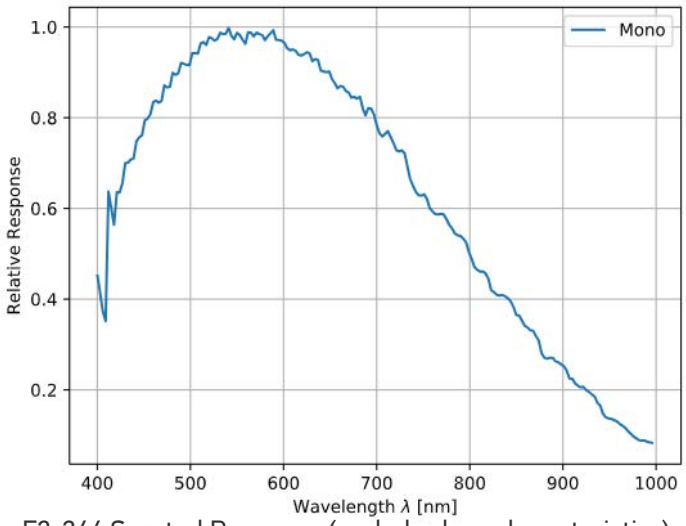


E2-123 Spectral Response (includes IR cut filter characteristics, but excludes lens and light characteristics).

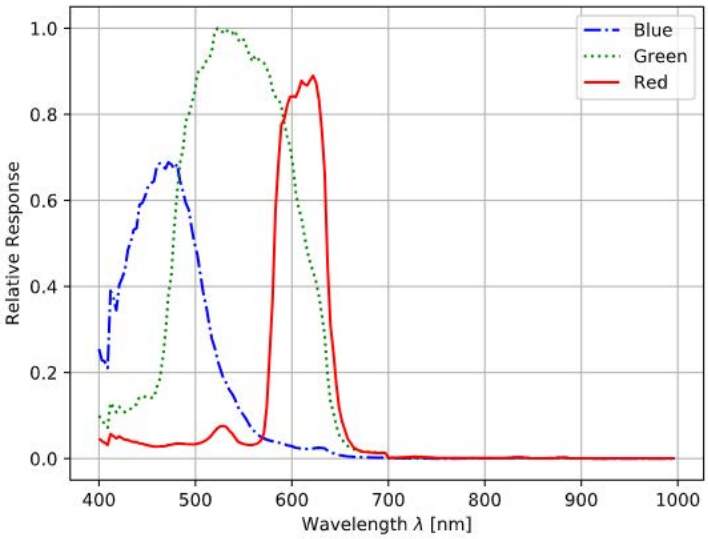
E2-123, E2-123C SPECIFICATIONS	
Part Number	959980011, 959980012
Pick-up Device	Global Shutter CMOS - 4096 (H) x 3000 (V) pixels
Sensor Size	13.91 mm (1/1.2") diagonal 11.2230 (h) x 8.2200 (v) mm
Capture Rate	9.5 fps at full resolution
Pixel Size	2.74 x 2.74 micrometers
Gain	0 to 48 dB
Shutter Open	13 to 1,000,000 microseconds
Software Version	Impact Software Release 13.6.0 or greater

E2-244, E2-244C

This camera captures a 5328 by 4608 pixel size image with square pixels. It can partially scan the image horizontally and vertically.



E2-244 Spectral Response (excludes lens characteristics)



E2-244 Spectral Response (includes IR cut filter characteristics, but excludes lens and light characteristics).

E2-244, E2-244C SPECIFICATIONS	
Part Number	959980013, 959980014
Pick-up Device	Global Shutter CMOS - 5328 (H) x 4608 (V) pixels
Sensor Size	19.3 mm (1.2") diagonal 14.600 (h) x 12.626 (v) mm
Capture Rate	4.8 fps at full resolution
Pixel Size	2.74 x 2.74 micrometers
Gain	0 to 48 dB
Shutter Open	16 to 1,000,000 microseconds
Software Version	Impact Software Release 13.6.0 or greater

M-Series

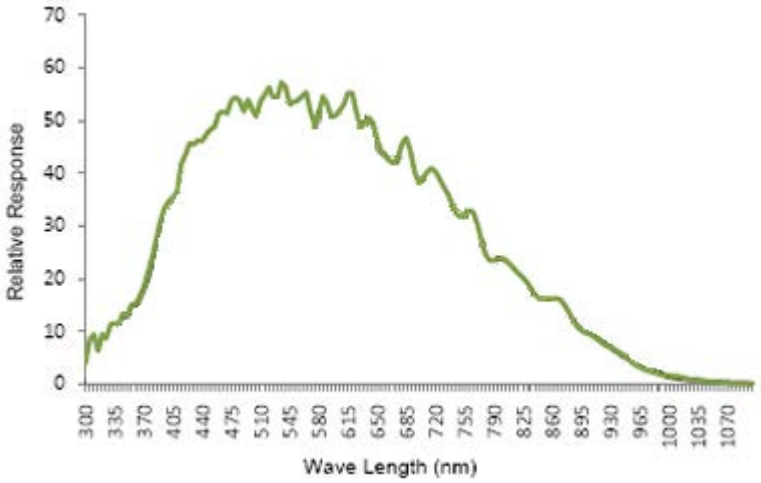
M1xx, M1xxC

All M1xx cameras have the following specifications. Model numbers that end in “C” are color cameras.

M1XX COMMON SPECIFICATIONS	
Lens Mount	C mount
Cabling	Camera cable provides trigger. Ethernet cable transmits video and provides POE.
Operating Environment	Temperature: 0 to +50 C (+32 to 122 F) Humidity: 0 to 90% (non-condensed)
Vibration	5g (11 to 200 Hz)
Power	Provided by Power Over Ethernet
Weight	3.2 ounces (~90 g)

M190, M190C

This camera captures a 2048 by 1088 pixel size image with square pixels. It can partially scan the image horizontally and vertically.

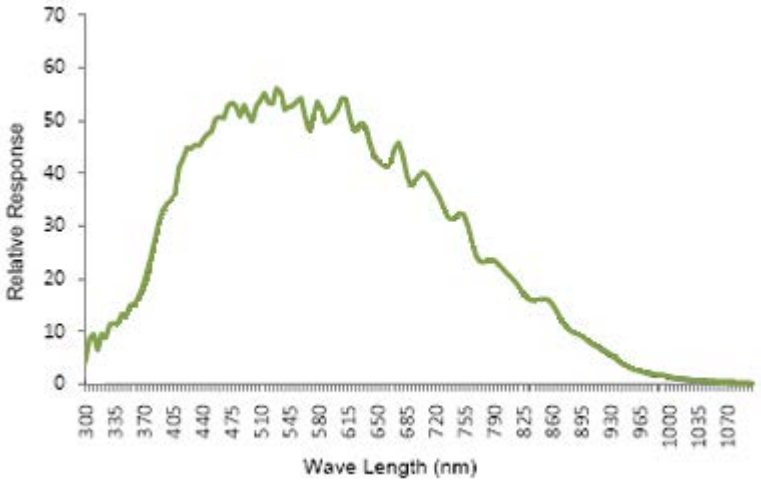


M190 Spectral Response (excludes lens and light source characteristics)

M190 SPECIFICATIONS	
Part Number	601-0454; 601-0455
Pick-up Device	Global Shutter CMOS - 2048 (H) x 1088 (V) pixels
Sensor Size	2/3" (12.749 mm) diag - 11.26 mm (H) × 5.98mm (V)
Capture Rate	50 full-resolution fps; higher with partial scan
Pixel Size	5.5 x 5.5 micrometers
Gain	100% to 1023%
Shutter Open	31 to 1,000,000 microseconds
Exposure Start Delay	34.50 µsec
Software Version	Impact Software Release10.5.0 or greater

M195, M195C

This camera captures a 2048 by 2048 pixel size image with square pixels. It can partially scan the image horizontally and vertically.



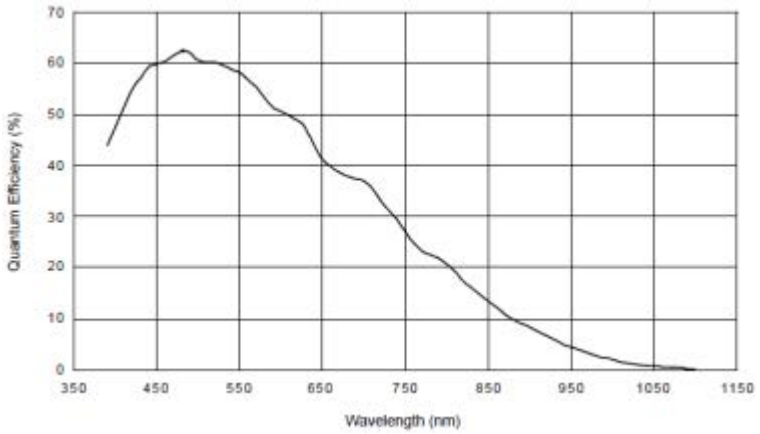
M195 Spectral Response (excludes lens and light source characteristics)

M195 SPECIFICATIONS	
Part Number	601-0456; 601-0457

M195 SPECIFICATIONS	
Pick-up Device	Global Shutter CMOS - 2048 (H) x 2048 (V) pixels
Sensor Size	1" (15.92mm) diag - 11.26 mm (H) x 11.26 mm (V)
Capture Rate	25 full-resolution fps; higher with partial scan
Pixel Size	5.5 x 5.5 micrometers
Gain	100% to 1023%
Shutter Open	31 to 1,000,000 microseconds
Exposure Start Delay	34.50 µsec
Software Version	Impact Software Release10.5.0 or greater

M197, M197C

This camera captures a 2592 by 1944 pixel size image with square pixels.

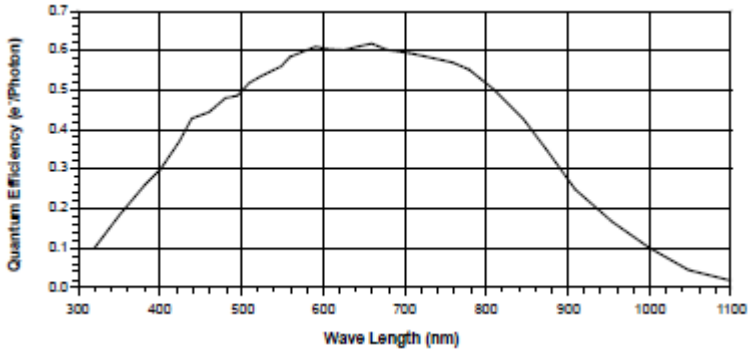


M197 Spectral Response (excludes lens and light source characteristics)

M197 SPECIFICATIONS	
Pick-up Device	Progressive Scan CMOS, Rolling Shutter - 2592(H) x 1944 (V) pixels
Sensor Size	1/2.5" 7.13mm diagonal 5.70 mm (H) x 4.28mm (V)
Capture Rate	14 full-resolution fps
Pixel Size	2.2 x 2.2 micrometers
Software Version	Impact Software Release11.0.0 or greater

M565/M570/M575/M580 Camera

These cameras have the following specifications.



Spectral Response (excludes lens and light source characteristics)

M565/M570/M575/M580 COMMON SPECIFICATIONS	
Lens Mount	F or C mount; Add -F to part number for F mount
Cabling	6-pin cable provides power. 12-pin cable provides frame and line triggers. Ethernet cable transmits video
Operating Environment	Temperature: 0 to +50 C (+32 to 122 F) Humidity: 20 to 80% (non-condensed)
Vibration	5g (11 to 200 Hz)
Weight	~8 ounces (240 grams); ~11.6 ounces (330 grams) with F-mount lens adapter
Pick-up Device	Linear CMOS

M565 camera

This camera captures a 2048 pixel width image with a maximum line rate of 51khz.It is a monochrome, GigE line scan camera with the following specifications.

M565 SPECIFICATIONS	
Sensor Size	2048 pixels
Capture Rate	51,000 lines per second maximum
Pixel Size	7 x 7 micrometers
Power	+12 to +24 VDC provided by 6-pin camera cable (3 Watts maximum)
Maximum Frame Height	12288 Pixels
Software Version	Impact Software Release 11.2.1.11 or greater

M570 camera

This camera captures a 4096 pixel width image with a maximum line rate of 26khz.It is a monochrome, GigE line scan camera with the following specifications.

M570 SPECIFICATIONS	
Sensor Size	4096 pixels
Capture Rate	26,000 lines per second maximum
Pixel Size	7 x 7 micrometers
Power	+12 to +24 VDC provided by 6-pin camera cable (4 Watts maximum)
Maximum Frame Height	7147 Pixels
Software Version	Impact Software Release 11.2.1.11 or greater

M575 camera

This camera captures a 6144 pixel width image with a maximum line rate of 17khz.It is a monochrome, GigE line scan camera with the following specifications.

M575SPECIFICATIONS	
Sensor Size	6144 pixels
Capture Rate	17,000 lines per second maximum
Pixel Size	7 x 7 micrometers
Power	+12 to +24 VDC provided by 6-pin camera cable (4.5 Watts maximum)
Maximum Frame Height	5360 Pixels
Software Version	Impact Software Release 11.8.0.97 or greater

M580 camera

This camera captures a 8192 pixel width image with a maximum line rate of 12khz.It is a monochrome, GigE line scan camera with the following specifications.

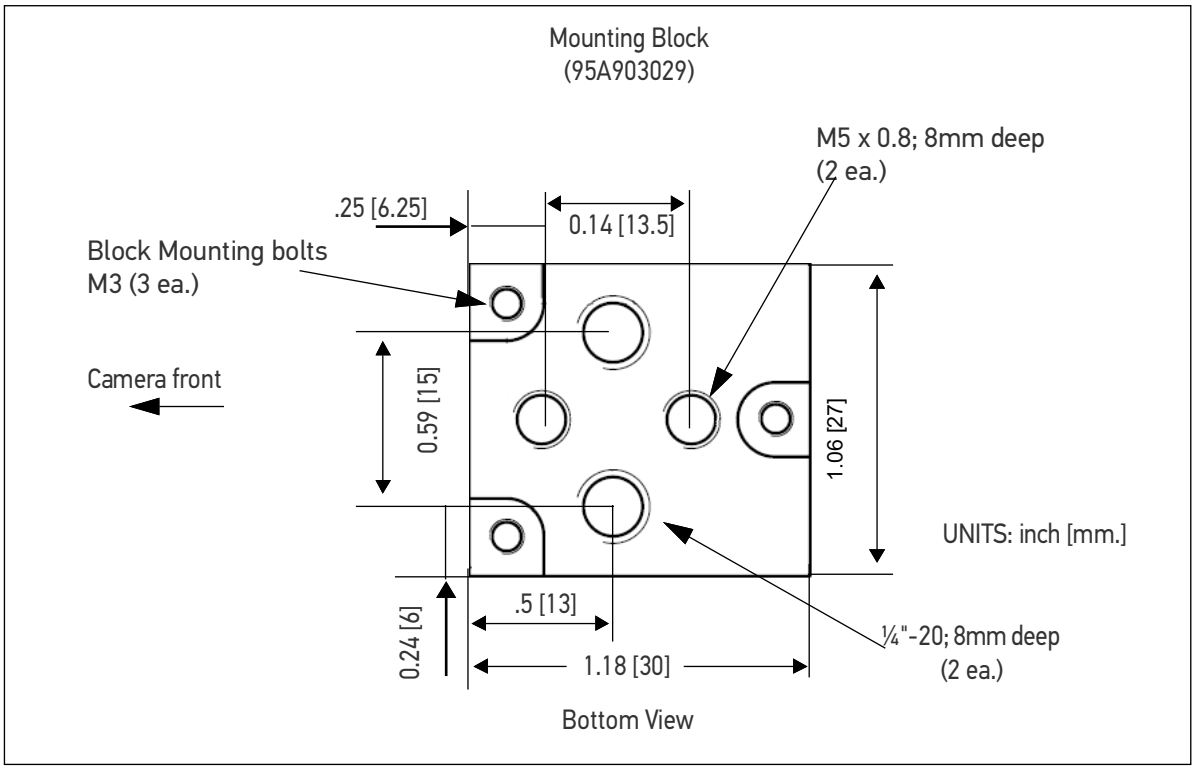
M580 SPECIFICATIONS	
Sensor Size	8192 pixels
Capture Rate	12,000 lines per second maximum
Pixel Size	3.50 x 3.50 micrometers
Power	+12 to +24 VDC provided by 6-pin camera cable (4.5Watts maximum)
Maximum Frame Height	3573 Pixels
Software Version	Impact Software Release 11.8.0.97 or greater

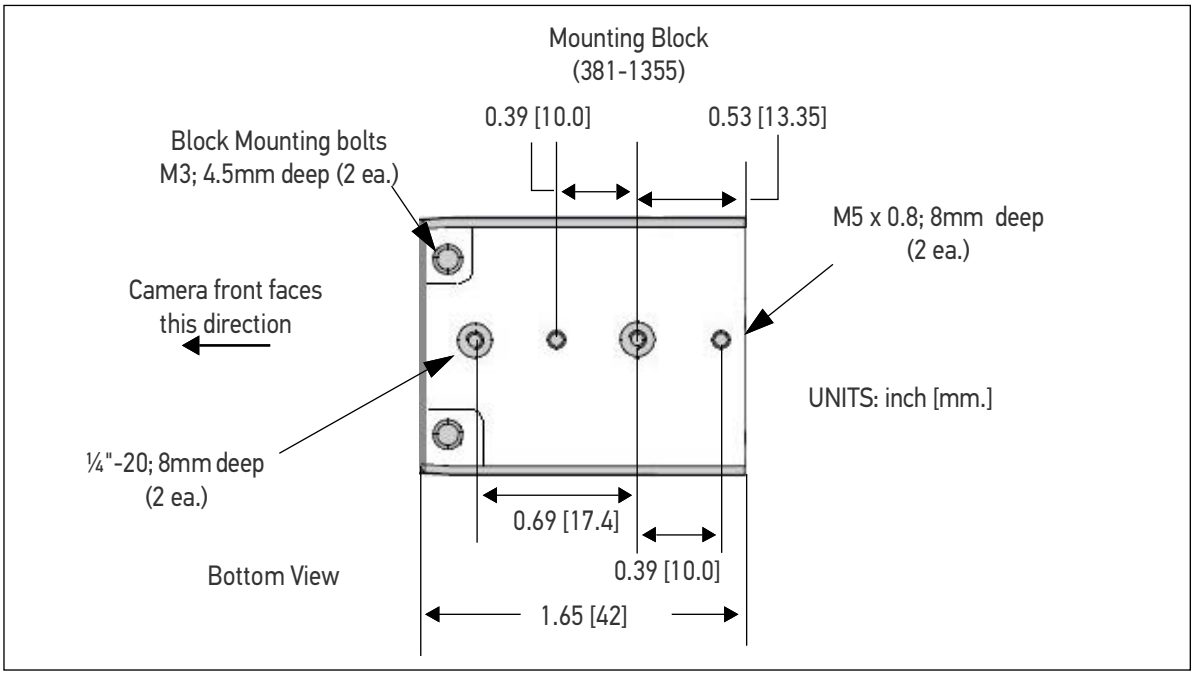
MOUNTING THE CAMERA

This section provides instructions for mounting Datalogic cameras. For information about third-party cameras, consult the manufacturer's documentation for those cameras.

To mount an M1xx or E1xx camera

1. With the mounting block held tightly against the camera body, insert the mounting bolts through the mounting bolt holes (see diagram below).
2. Turn the mounting bolt clockwise to tighten the block and secure it to the camera.
3. Use appropriately sized fasteners in the pre-threaded holes in the bottom of the mounting bracket to secure the mounting block to a rigid surface for proper stability and heat transfer. (See "M1xx and E1xx" on page 28.)



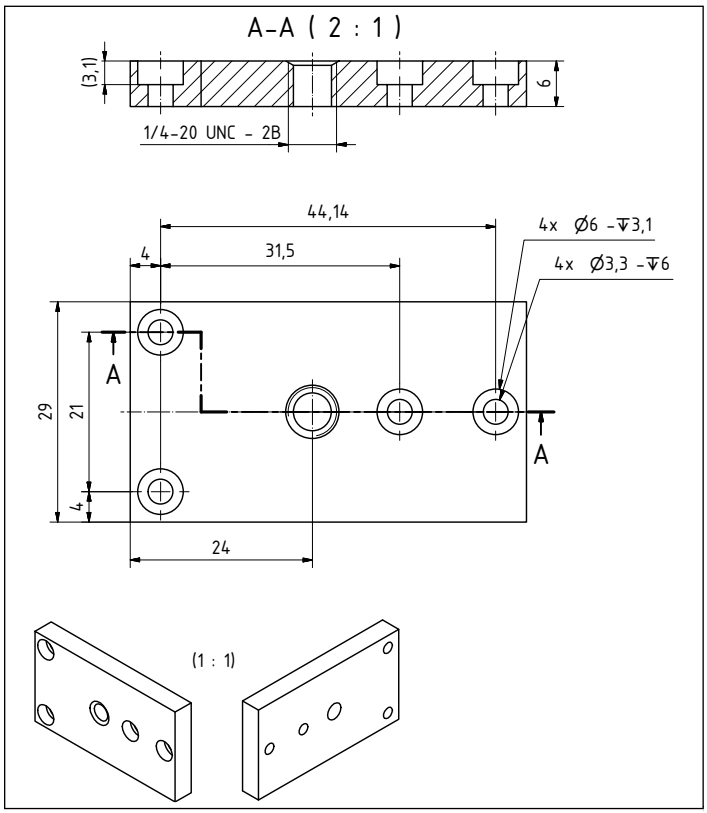


To mount an E2-xxx camera

1. With the mounting block held tightly against the camera body, insert the mounting bolts through the mounting bolt holes (see diagram below).

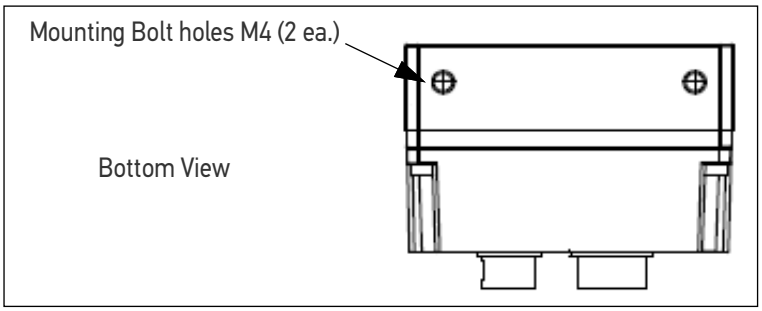
2. Turn the mounting bolt clockwise to tighten the block and secure it to the camera.

Use appropriately sized fasteners in the pre-threaded holes in the bottom of the mounting bracket to secure the mounting block to a rigid surface for proper stability and heat transfer. (See "E2-xxx" on page 29.)



To mount an M565/M570/M575/M580 camera

1. With the camera body held tightly against the desired mounting surface, insert two mounting bolts through the mounting surface and into the mounting bolt holes (see diagram below).



CAMERA CONNECTION

CAUTION: Never wire M1xx, E1xx or E2-xxx Camera Strobe Outputs in parallel with M1xx, E1xx, E2-xxx, M2xx, or M3xx Camera Strobe Outputs. This will damage the cameras.

M1xx, E1xx and E2-xxx Camera Connection

To connect M1xx and E1xx camera trigger signals and strobe outputs, use cable 606-0674-xx (6 pin Hirose Male to DB9) with terminal block 661-0399.

To connect E2-xxx camera trigger signals and strobe outputs, use cable M8 6pin with terminal block 661-0399.

TERMINAL NAME	SIGNAL	NOTES
Optional Camera Power	DO NOT USE	Do NOT apply power to this terminal if power is supplied by Power over Ethernet (PoE; enable/disable in VPM-Settings)
Optional Camera Power Ground	DO NOT USE	Not required if ground is supplied by Power Over Ethernet (PoE; enable/disable in VPM-Settings)
I/O Ground	I/O Ground	

TERMINAL NAME	SIGNAL	NOTES
Trigger In**	Camera Trigger In	0 to +24 VDC recommended Maximum +30 VDC As sinking input Off: 0 to +1.4 VDC On: +2.2 to +24 VDC; 5 to 15 ma As sourcing input (see Trigger Pullup +VCC) Off: +2.2 to +24 VDC; 5 to 15 ma On: 0 to +1.4 VDC
Trigger Pullup +VCC**	Trigger In Pullup - use if Trigger In needs sourcing (see Note 1 below)	+24 VDC recommended Maximum +30 VDC (**Block contains 1.6k Ohm 1W resistor between Trigger In and Trigger Pullup +VCC)
Strobe Output Pullup +VCC*	Strobe Supply Voltage - use if Strobe Trigger Output needs sourcing (see Note 2 below)	Based on Strobe requirement (optional) Max: +30 VDC; 50 ma (*Block contains 1.6k Ohm 1W resistor between Strobe Trigger Output and Strobe Output Pullup +VCC)
Strobe Trigger Output*	Trigger Out to Strobe (see Note 3 below)	DO NOT APPLY ANY VOLTAGE DIRECTLY TO THIS OUTPUT. DO NOT WIRE OUTPUTS IN PARALLEL.

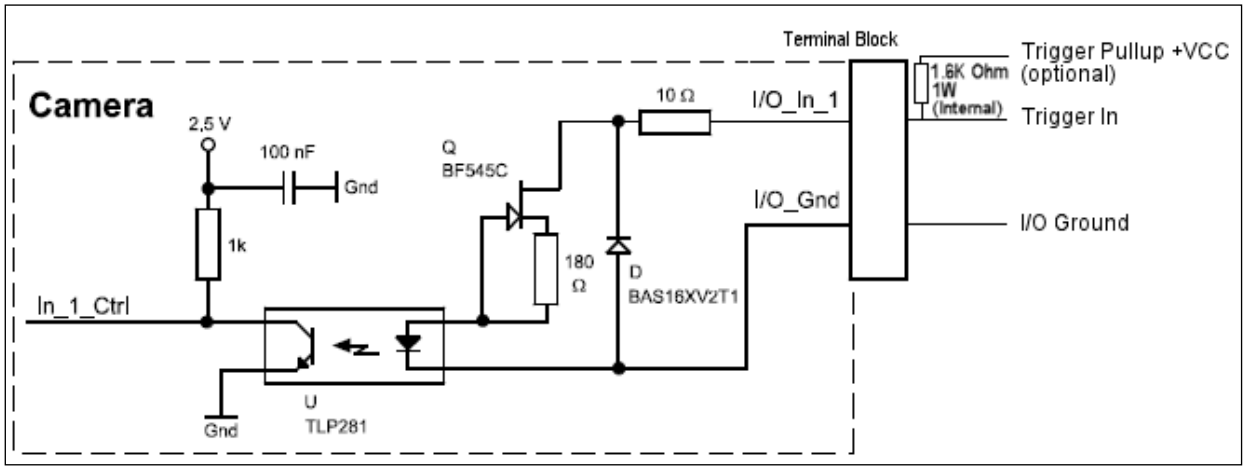
NOTE: If Camera Trigger In requires a sinking signal, set the Software Trigger Event to Rising Edge. If it requires a sourcing signal, set the Software Trigger Event to Falling Edge.

NOTE: If Strobe Trigger Output requires a sinking signal, set the Strobe Trigger Output to Falling Edge. If it requires a sourcing signal, set the Strobe Trigger Output to Rising Edge.

NOTE: Disconnecting the camera will turn on some strobe lights.

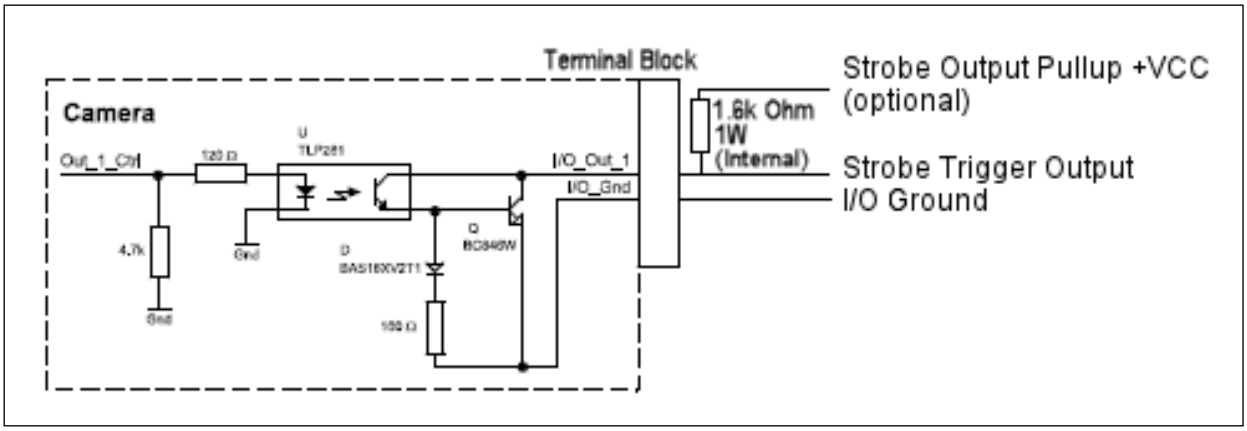
M1xx and E1xx Circuit Diagrams

M1xx Trigger In Circuit

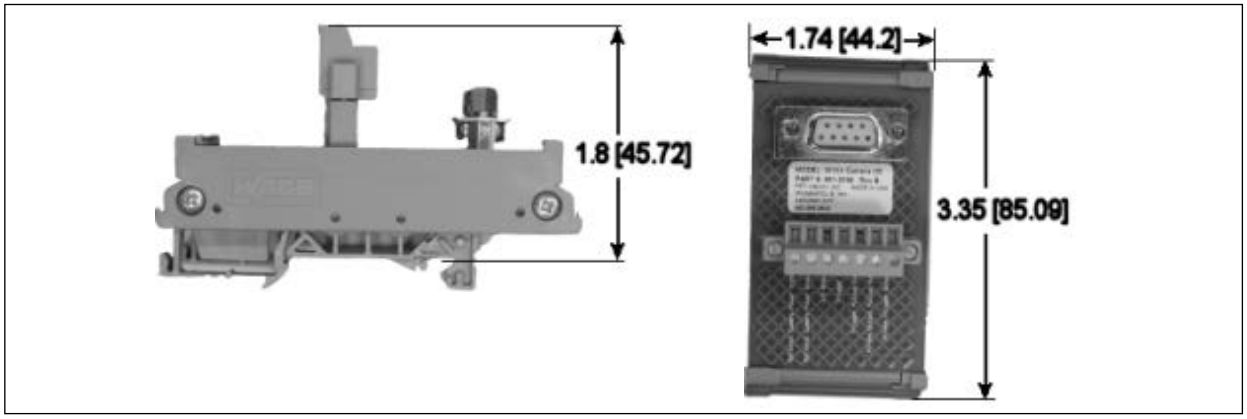


CAUTION: Never wire M1xx or E1xx Camera Strobe Outputs in parallel with M1xx, E1xx, M2xx, or M3xx Camera Strobe Outputs. This will damage the cameras.

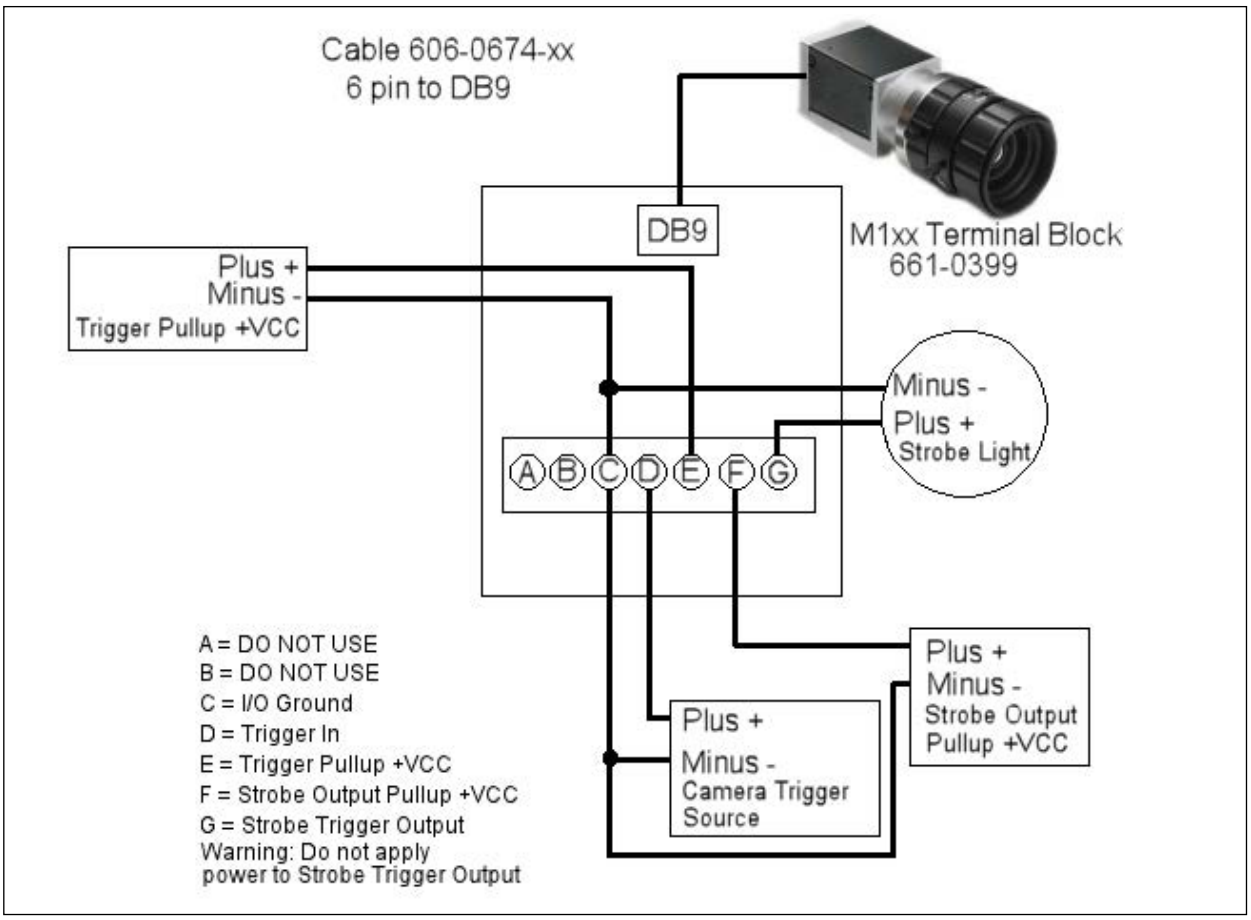
M1xx Strobe Trigger Output Circuit



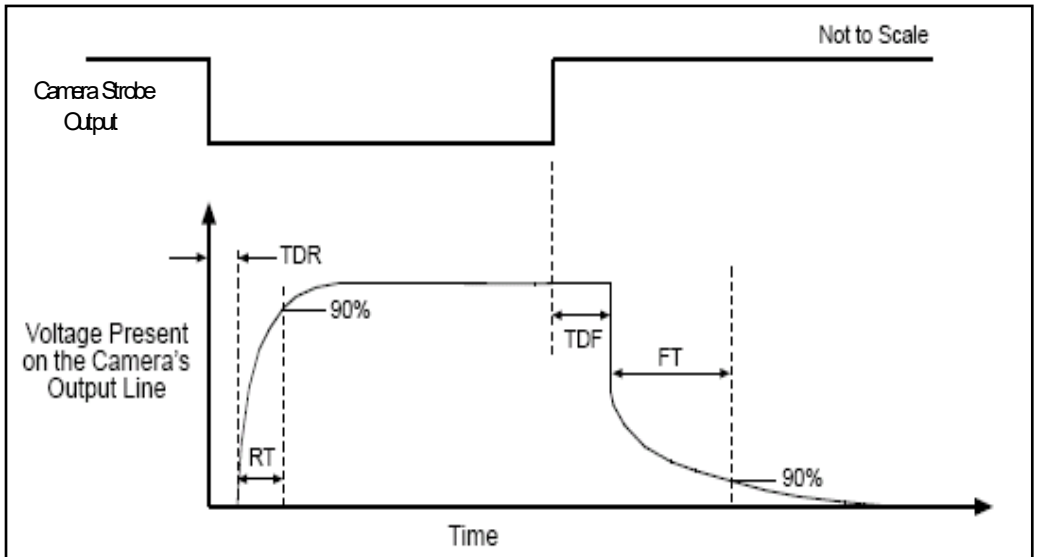
661-0399 Terminal Block Dimensions



M1xx and E1xx Terminal Connections



The response times for the strobe output on the M1xx and E1xx camera will typically fall into the ranges specified below. The exact response time for your application will depend on the external resistor and the applied voltage you use. The shutter begins opening simultaneously with the “Camera Strobe Output” in the diagram. Set the strobe time 60 to 110 microseconds longer than you would on a M2xx to account for the delays. The shutter time must then be set a little longer than the strobe time.



Time Delay Rise (TDR) = 40 us
Rise Time (RT) = 20 us to 70 us
Time Delay Fall (TDF) = 0.6 us
Fall Time (FT) = 0.7 us to 1.4 us

M565/M570/M575/M580 Camera Connection

To connect one of these cameras, use terminal block 661-0401 with cable 606-0673-xx (12-pin to HD-15 camera I/O) and cable 606-0674-xx (6 pin to DB9 camera power). For details about programming the Line Trigger, refer to the Impact Reference Guide.

NOTE: Do NOT use the M2xx/M3xx terminal block (661-0400) or M1xx block (661-0399) to connect this camera. They will NOT provide the correct signal levels.

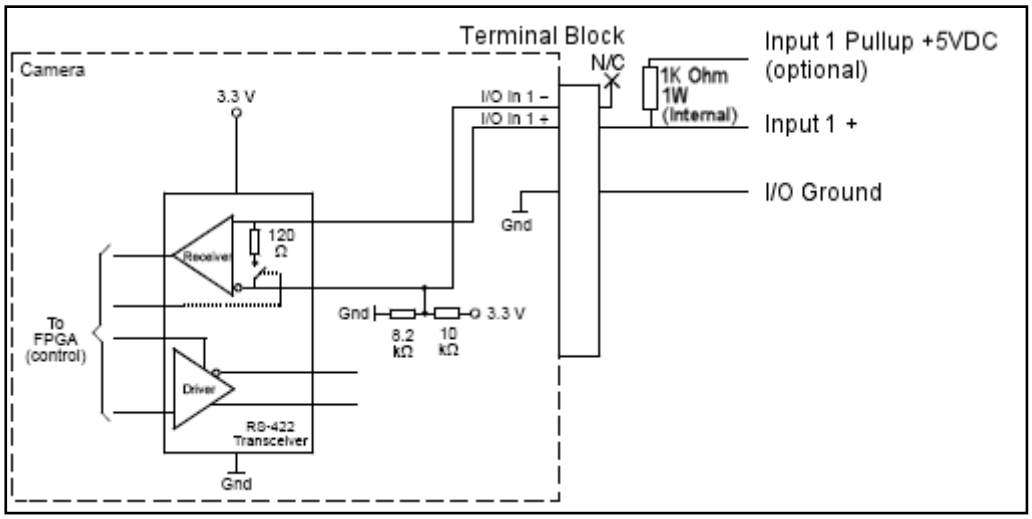
TERMINAL	SIGNAL NAME	NOTES
Camera Power Ground	Camera Ground	See Note 1 Below
I/O Ground	I/O Ground	See Note 1 Below
Camera Power +12VDC	Camera Power	+12 VDC (+-10%) @ 700 mA Max
Input 1 -	No Connection	DO NOT USE
Input 1 +	Frame Start Trigger	As sinking input Off 0 to +0.8 VDC On: +2.0 to +5 VDC As sourcing input (see Input 1 Pullup) Off: +2.0 to +5 VDC On 0 to +0.8 VDC Maximum: +5 VDC
Input 2 -	No Connection	DO NOT USE
Input 2 +	Single Line Trigger **OR** Phase A Line Trigger (Quadrature Encoder)	As sinking input Off 0 to +0.8 VDC On: +2.0 to +5 VDC As sourcing input (see Input 2 Pullup) Off: +2.0 to +5 VDC On 0 to +0.8 VDC Maximum: +5 VDC
Input 3 -	No Connection	DO NOT USE
Input 3 +	Phase B Line Trigger (Quadrature Encoder)	As sinking input Off 0 to +0.8 VDC On: +2.0 to +5 VDC As sourcing input (see Input 3 Pullup) Off: +2.0 to +5 VDC On 0 to +0.8 VDC Maximum: +5 VDC
Output 1 -	Not Currently Supported	DO NOT USE
Output 1 +	Not Currently Supported	DO NOT USE
Output 2 -	Not Currently Supported	DO NOT USE
Output 2 +	Not Currently Supported	DO NOT USE
Input 1 Pullup +5VDC	Frame Start Trigger Pullup - use if Input 1 needs sourcing input	Maximum: +5 VDC

TERMINAL	SIGNAL NAME	NOTES
Input 2 Pullup +5VDC	Line Trigger Pullup - use if Input 2 needs sourcing input	Maximum: +5 VDC
Input 3 Pullup +5VDC	Line Trigger Pullup - use if Input 3 needs sourcing input	Maximum: +5 VDC

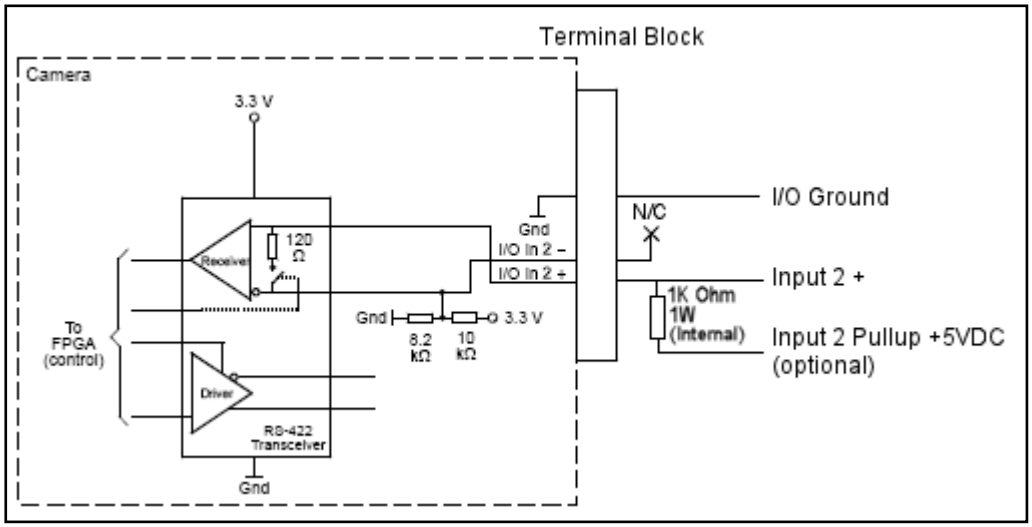
NOTE: To help prevent ground loops and possible false triggering, we recommend connecting I/O Ground to Camera Power Ground.

M565/M570/M575/M580 Circuit Diagrams

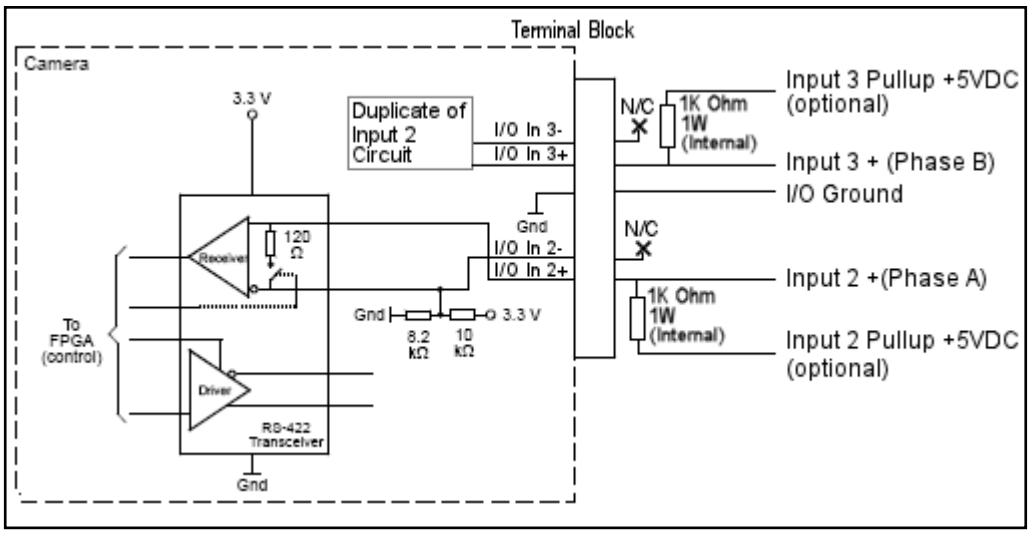
Frame Trigger Input Circuit



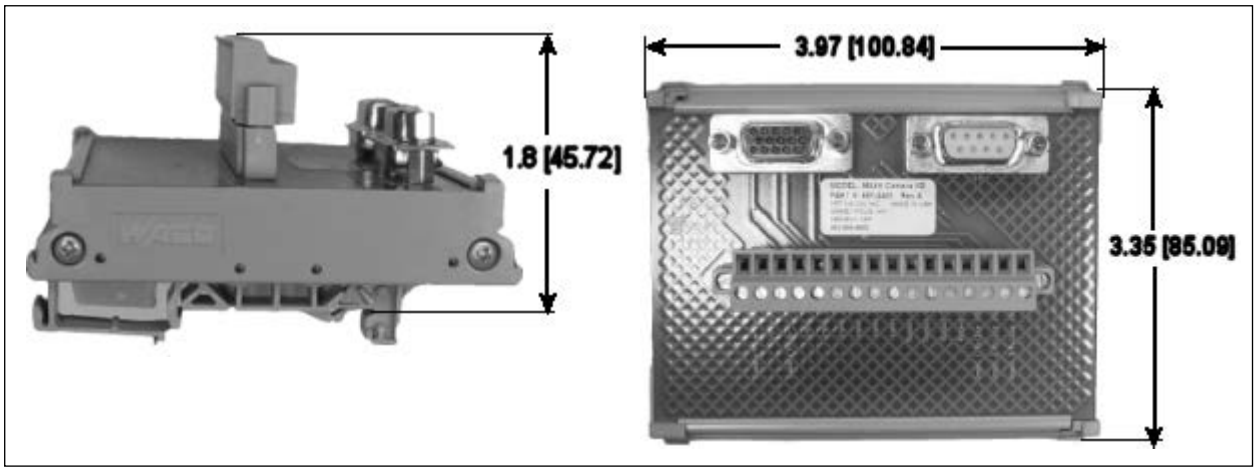
Single Line Trigger Input Circuit



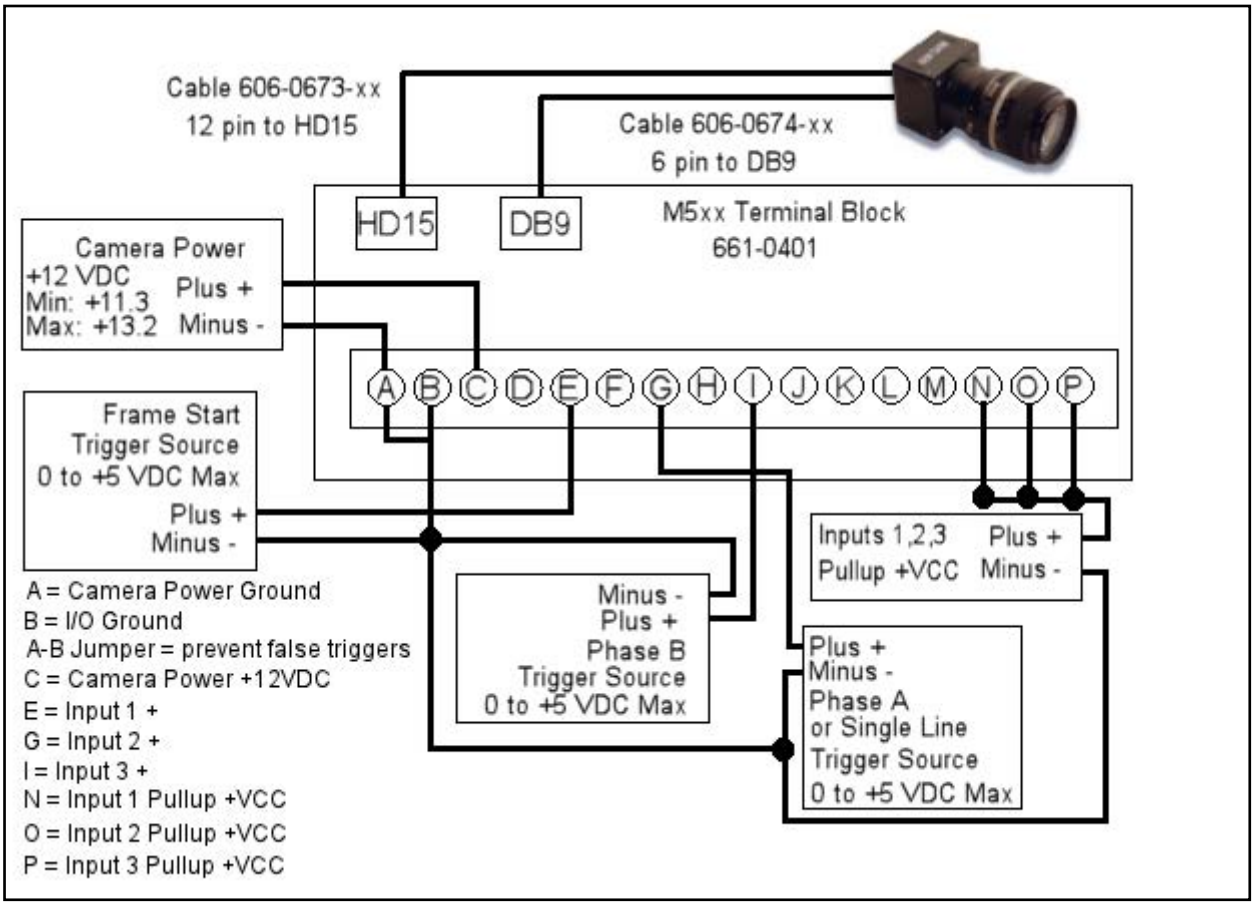
Quadrature Encoder Line Trigger Input Circuit



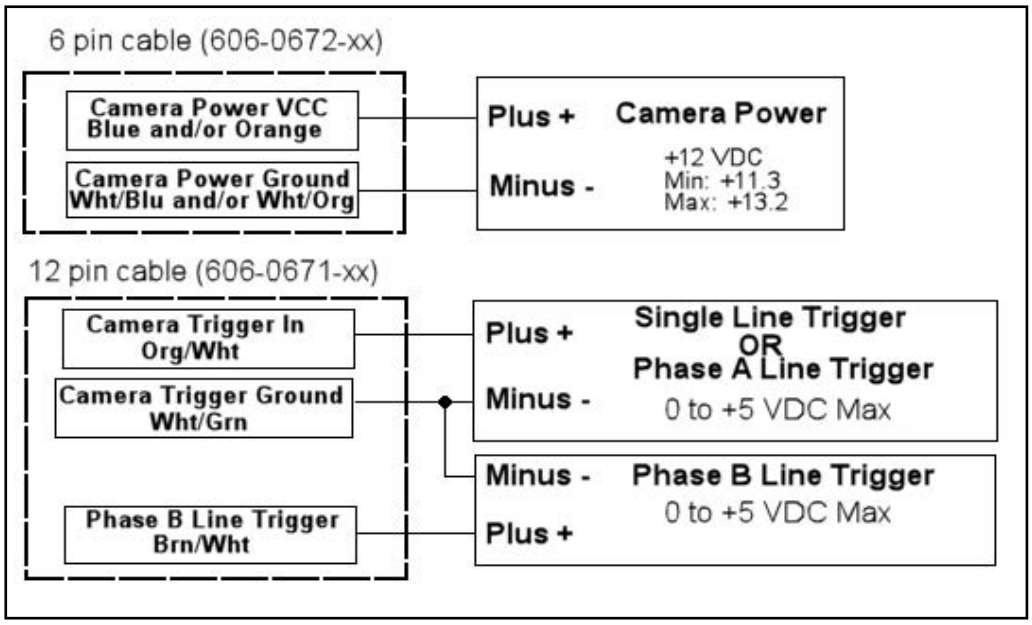
661-0401 Terminal Block Dimensions



Terminal Connections



Unterminated Cable Connections



SUPPORTED DATALOGIC CAMERA AND IMPACT SOFTWARE COMPATIBILITY

CAMERA MODEL	MINIMUM COMPATIBLE SW VERSION	NOTES
E101 E101C E151, E151C	11.0.0.213	E-Series cameras are not compatible with MX20, MX40, or MX80 processors using Impact releases earlier than 11.10.4 or any 11.11.x release
E182 E182C	11.8.1.30	E-Series cameras are not compatible with MX20, MX40, or MX80 processors using Impact releases earlier than 11.10.4 or any 11.11.x release
E193 E193C E198 E198C	11.10.0.70	E-Series cameras are not compatible with MX20, MX40, or MX80 processors using Impact releases earlier than 11.10.4 or any 11.11.x release
E2-123 E2-123C E2-244 E2-244C	13.6.0	
M1xx M2xx M2xx-RA M3xx M3xx-RA	10.0.0.139	
M1xxC M2xxC M2xxC-RA M3xxC M3xxC-RA	10.1.0.52	
M197 M197C	11.2.0.83	Rolling Shutter and Global Reset Release see “Camera basics” on page 25
M205 M205C	10.3.0.75	
M5xx (except as listed below)	10.1.0.52	
M565 M570	11.2.1.11	
M575 M580	11.8.0.97	

CAMERA MODEL	MINIMUM COMPATIBLE SW VERSION	NOTES
U100 U100C U110 U110C U150 U150C U180 U180C U190 U190C U195 U195C U197 U197C	11.5.0.95	
U101 U101C U151 U151C	11.8.0.97	

THIRD-PARTY CAMERAS

The MX-E90 Industrial Vision Processor and Impact Software support only the third-party cameras listed in this section. This information, including power and trigger signal connections, are provided by us as a convenience. You must purchase a license from us to connect a third-party camera to the MX-E90 Industrial Vision Processor.

NOTE: Datalogic assumes no responsibility for the accuracy or timeliness of this third-party camera information. For complete details and the most accurate specifications for these cameras, consult the manufacturer's documentation.

JAI Cameras

NOTE: See "JAI Camera I/O Signals" on page 57 **for important information about camera and strobe signals.**

MODEL (GIGE)	RESOLUTION (MEGAPIXELS)	COLOR	IMAGE HORIZONTAL	IMAGE VERTICAL	MINIMUM SOFTWARE VERSION REQUIRED
sp-20000M-USB	20	No	5120	3840	12.2

*See "High Resolution (20+ MPX) Cameras support" on page 26 for special camera configuration settings.

JAI Camera Connection

To connect JAI camera power, trigger signals, and strobe outputs, use cable 606-0673-xx (12-pin to HD-15) with terminal block 661-0402.

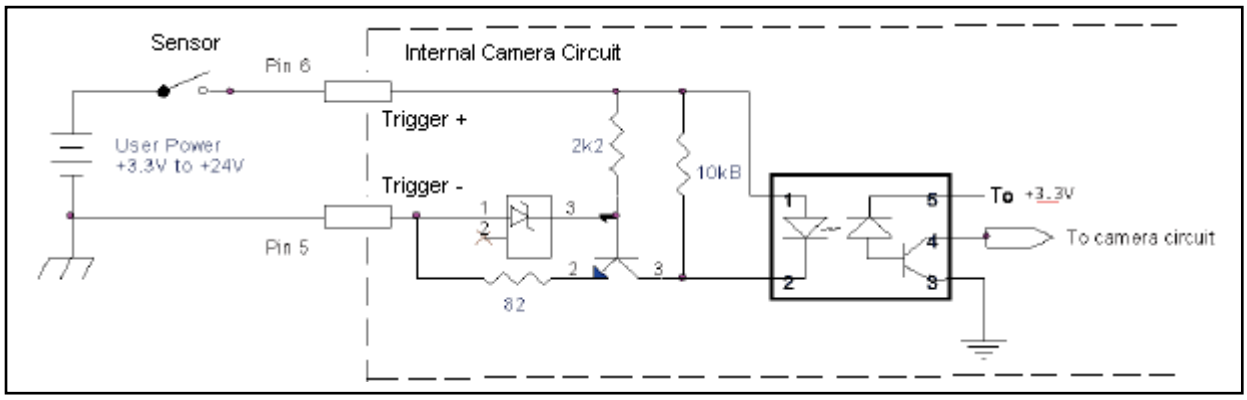
NOTE: Do NOT use terminal block 248-0141 to connect this camera. It will NOT provide the correct signal levels.

CAUTION: THE POWER AND GROUND CONNECTIONS FOR THIS CAMERA ARE DIFFERENT FROM OUR CAMERAS AND OTHER THIRD-PARTY CAMERAS. USE CAUTION WHEN CONNECTING POWER TO THESE CAMERAS.

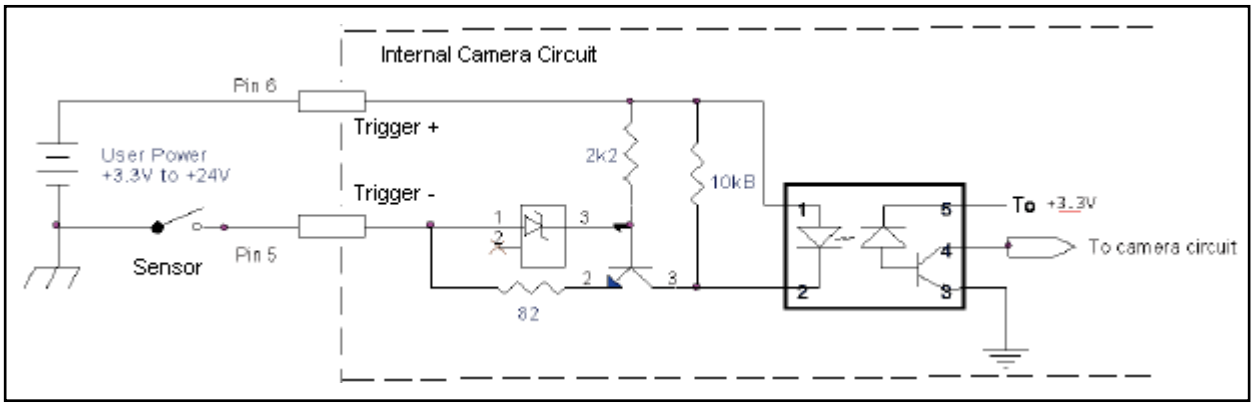
TERMINAL	SIGNAL NAME	NOTES
Camera Power Ground	Camera Ground	
Camera Power +12VDC	Camera Power	
Trigger Input -	Camera Trigger -	
Trigger Input +	Camera Trigger +	+0 to +24 VDC Off: 0 to +2.0 VDC On: +4.0 to + 24 VDC Maximum: +24 VDC
Input 2 -	Not Currently Supported	DO NOT USE
Input 2 +	Not Currently Supported	DO NOT USE
Strobe Output -	Strobe Output Ground	
Strobe Output +VCC	Power for Strobe Output	+5 to +24 VDC Maximum: +24 VDC; 100 mA
Output 2 -	Not Currently Supported	DO NOT USE
Output 2 +VCC	Not Currently Supported	DO NOT USE
Strobe Output Pull down GND	Strobe Output Pull down - use if Strobe Output needs sourcing output	
Output 2 Pull down GND	Not Currently Supported	DO NOT USE

JAI Camera Circuit Diagrams

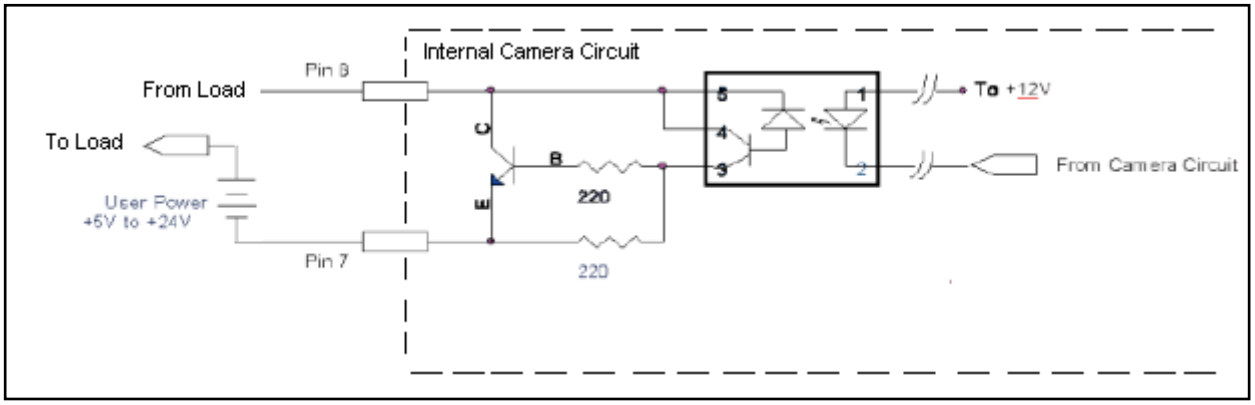
JAI Camera Trigger Input Circuit (sourcing)



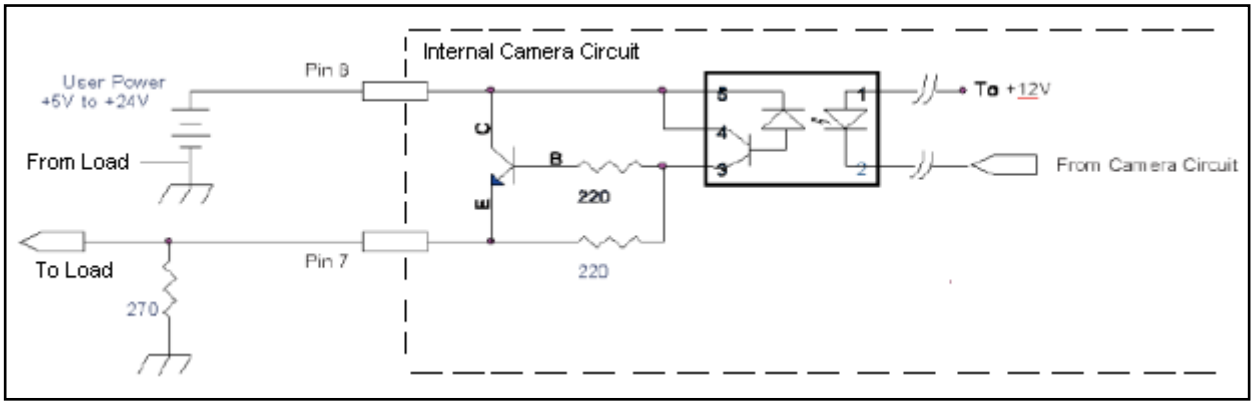
JAI Camera Trigger Input Circuit (sinking)



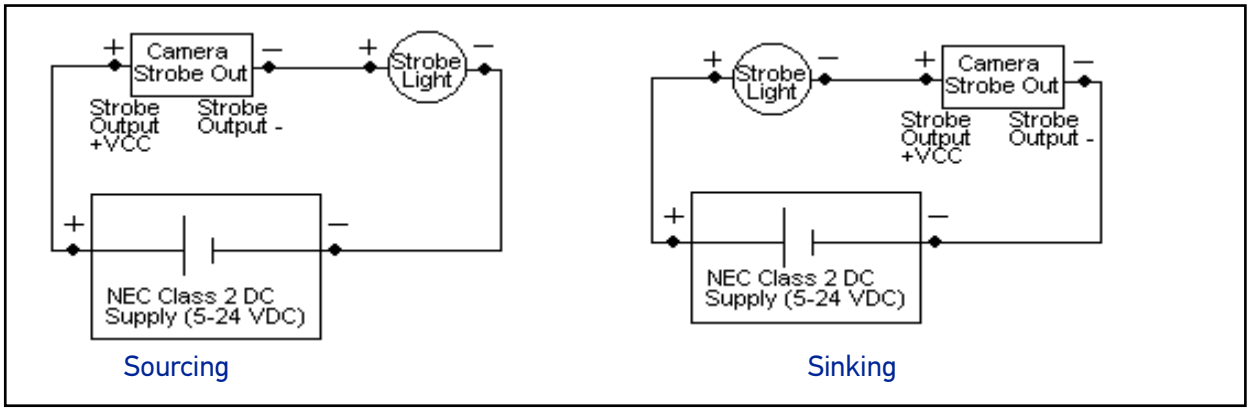
JAI Camera Strobe Output Circuit (sinking)



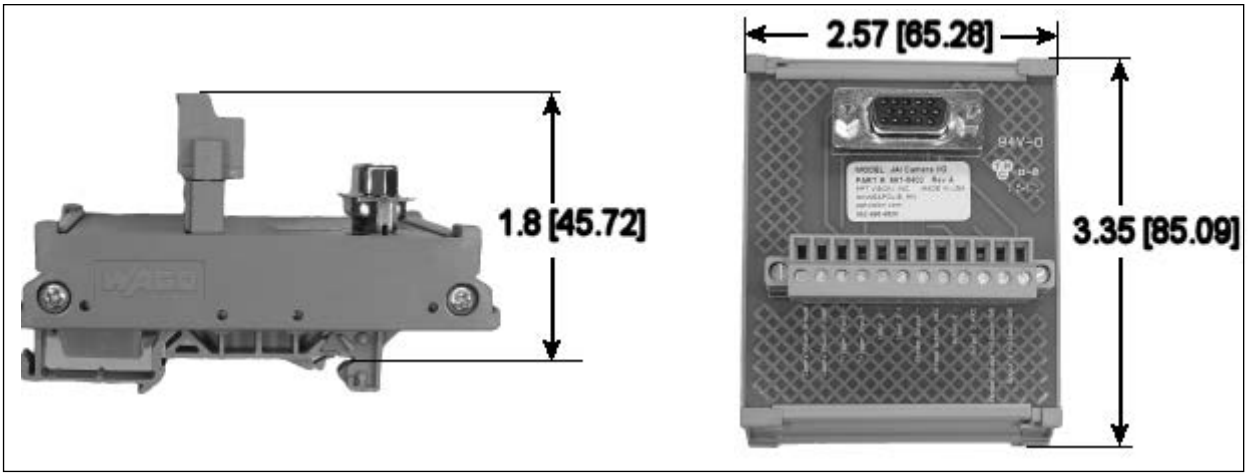
JAI Camera Strobe Output Circuit (sourcing)



JAI Camera Strobe Output Circuits

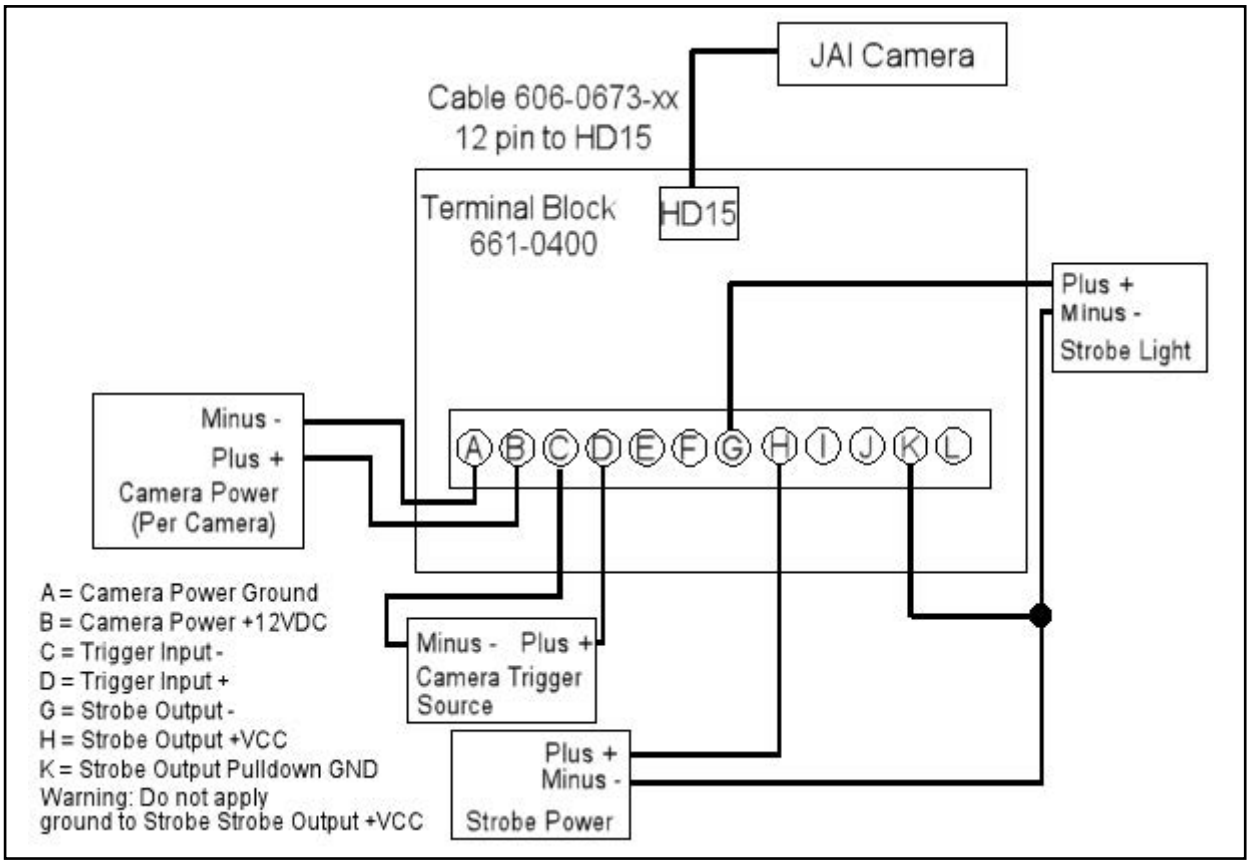


661-0402 Terminal Block Dimensions

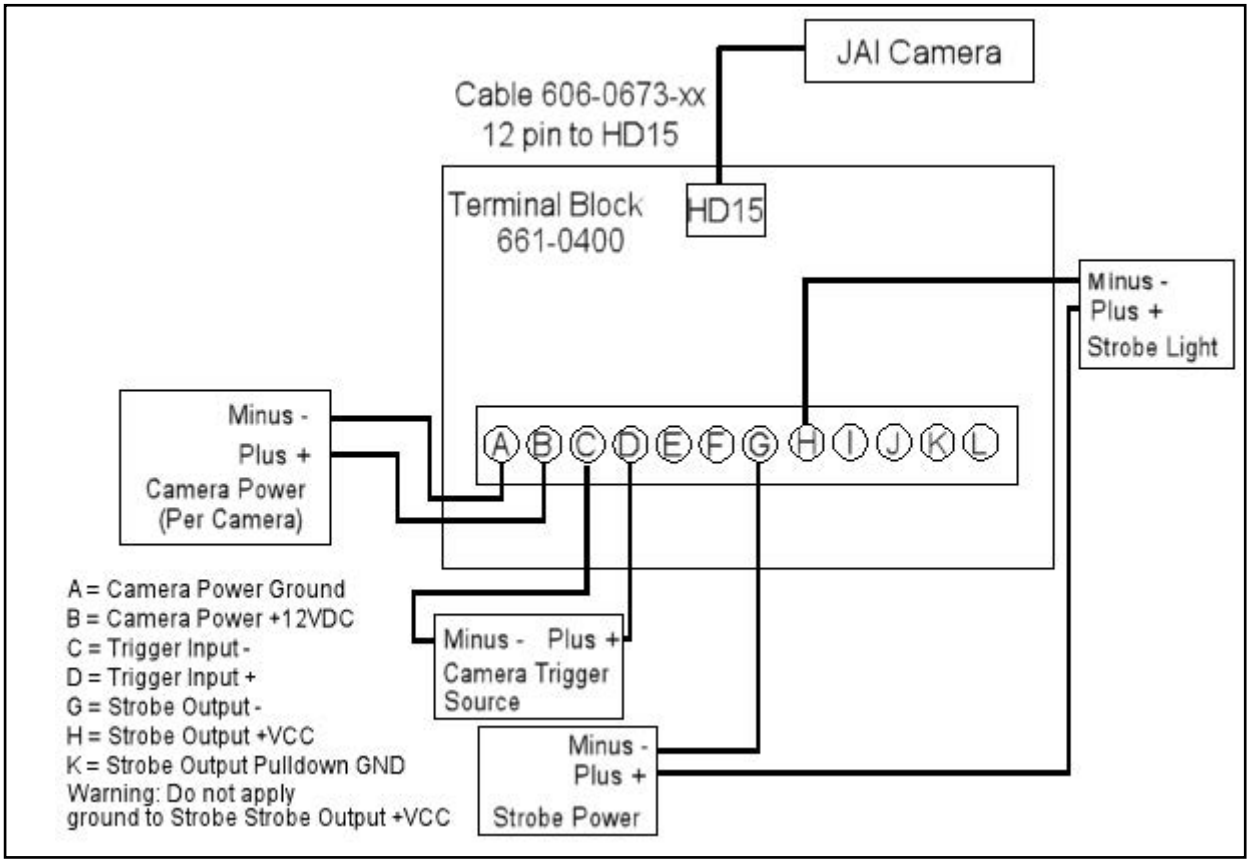


JAI Terminal Connections

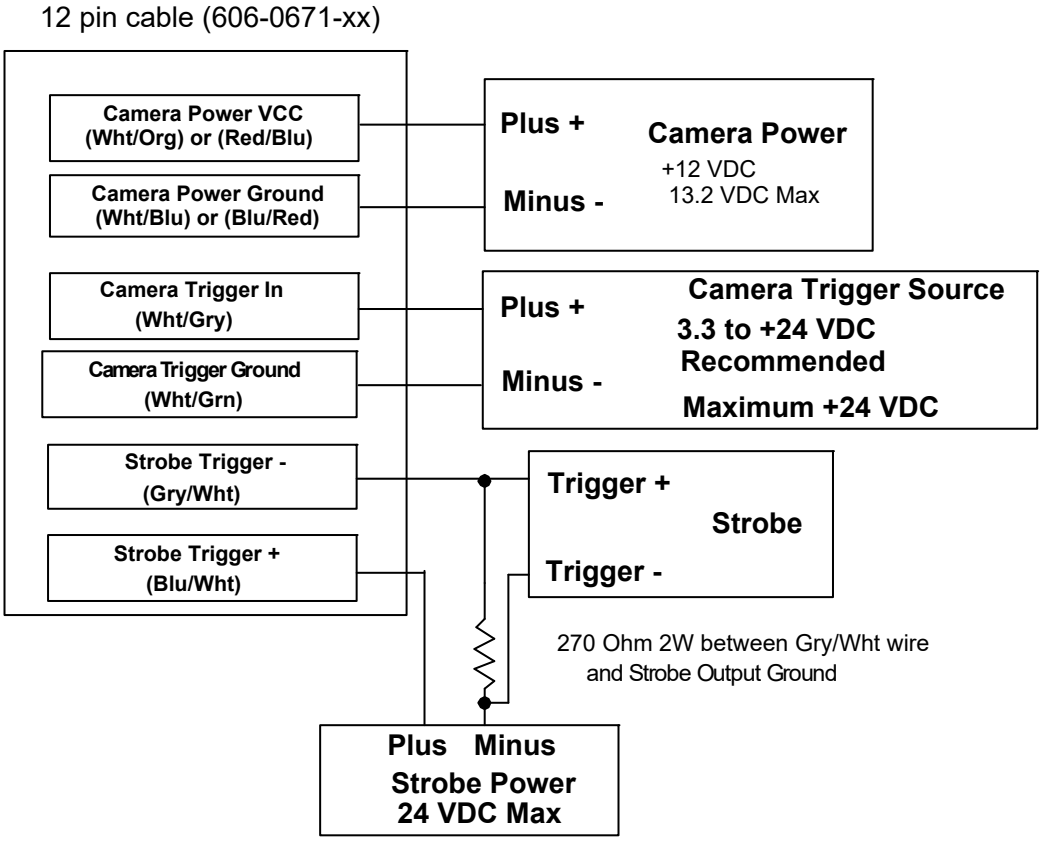
JAI Terminal Connections (sourcing)



JAI Terminal Connections (sinking)



JAI Unterminated Cable Connections



JAI Camera Unterminated Cable Connections

JAI Camera I/O Signals

On JAI AT200-GE, the camera software setup in Vision Program Manager (VPM) provides a camera trigger delay debounce setting, but no holdoff debounce setting. VPM also does not provide a strobe trigger pulse width setting. The strobe trigger pulse width coincides with the camera shutter speed open time setting so that it turns on when the exposure starts (shutter opens) and turns off when the exposure ends (shutter closes). Refer to “Trigger Events” and “Strobe Pulse Length” in the Impact Reference Guide for more details.

Basler Cameras

The MX-E90 Industrial Vision Processor and Impact Software can support a wide variety of Basler GigE cameras, in addition to the models listed below, including all Ace and Scout models. Ace model numbers begin with “acA” and Scout model numbers begin with “scA.” For complete details and the most accurate specifications for these cameras, consult the manufacturer’s documentation.

NOTE: Datalogic assumes no responsibility for the accuracy or timeliness of this third-party camera information. You must purchase a license from Datalogic to connect a third-party camera to the MX-E90 Industrial Vision Processor.

Basler Aviator Cameras

MODEL (GIGE)	RESOLUTION (MEGAPIXELS)	COLOR	IMAGE HORIZONTAL	IMAGE VERTICAL	FPS (APPROX)	MINIMUM SOFTWARE VERSION REQUIRED
avA1000-100gm avA1000-100gc	1	No Yes	1024	1024	101	10.3.0
avA1600-50gm avA1600-50gc	1	No Yes	1600	1200	55	10.3.0
avA1900-50gm avA1900-50gc	2	No Yes	1920	1080	51	10.3.0
avA2300-25gm avA2300-25gc	3	No Yes	2239	1750	26	10.3.0

Basler Area Scan Cameras

MODEL (GIGE)	COLOR	IMAGE HORIZONTAL	IMAGE VERTICAL	FPS (APPROX)	MINIMUM SOFTWARE VERSION REQUIRED
acA4112-8gm	No	4096	3000	8	12.2
acA4112-20um	No	4096	3000	23	12.2
acA5472-5gm	No	5472	3648	5	12.2
acA5472-5gc	Yes	5472	3648	5	12.2
acA720-290gm	No	720	540	291	12.2

Camera Connection

CAUTION: Third-party Camera Requirements are different. These cameras require +12 VDC Power. Use Caution when connecting power to these cameras.

To connect power, trigger signals, and strobe outputs for these Basler camera models, use cable 606-0673-xx (12-pin Hirose Male to HD-15) with terminal block 661-0400.

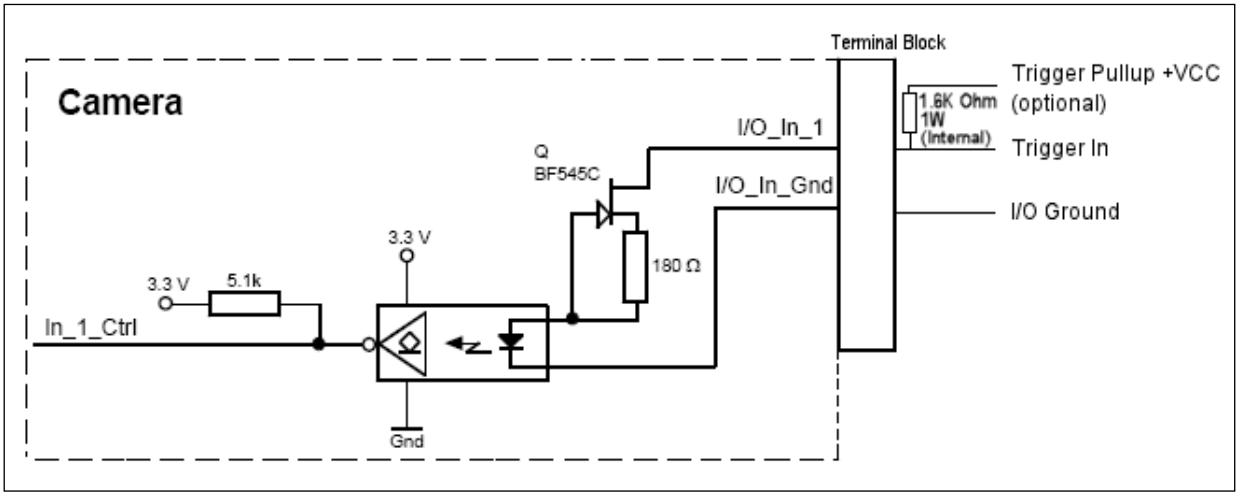
TERMINAL	SIGNAL NAME	NOTES
Camera Power Ground	Camera Ground	
I/O Ground	I/O Ground	
Camera Power +VDC	Camera Power	+12 VDC recommended @ 500 mA Max Maximum: +13.2 VDC
Output +VCC	Power for Strobe Trigger Out	+3.3 to +24 VDC; 50 mA Max Maximum: +30 VDC
Input 2 Pullup +VCC	DO NOT USE	Not Currently Supported
Trigger Pullup +VCC	Trigger In Pullup - use if Trigger In needs sourcing input	Recommended: +24 VDC
Trigger In	Camera Trigger In (see Note 1 below)	0 to +24 VDC recommended Maximum +30 VDC As sinking input Off: 0 to +1.4 VDC On: +2.2 to +24 VDC; 5 to 15 ma As sourcing input (see Trigger Pullup +VCC) Off: +2.2 to +24 VDC; 5 to 15 ma On: 0 to +1.4 VDC
Input 2	DO NOT USE	Not Currently Supported
Strobe Trigger Out	Trigger Out to Strobe (see Note 2 below)	DO NOT APPLY GROUND DIRECTLY TO THIS OUTPUT.
Output 2	DO NOT USE	Not Currently Supported
Output 3	DO NOT USE	Not Currently Supported
Output 4	DO NOT USE	Not Currently Supported

NOTE: If Camera Trigger In requires a sinking signal, set the Software Trigger Event to Rising Edge. If it requires a sourcing signal, set the Software Trigger Event to Falling Edge.

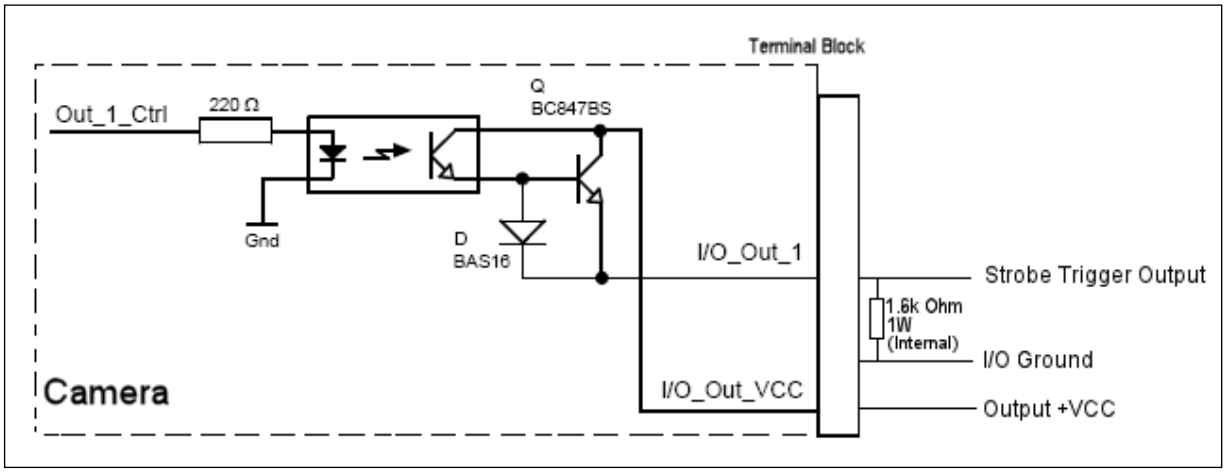
NOTE: If Strobe Trigger Output requires a sinking signal, set the Strobe Trigger Output to Falling Edge. If it requires a sourcing signal, set the Strobe Trigger Output to Rising Edge.

Circuit Diagrams

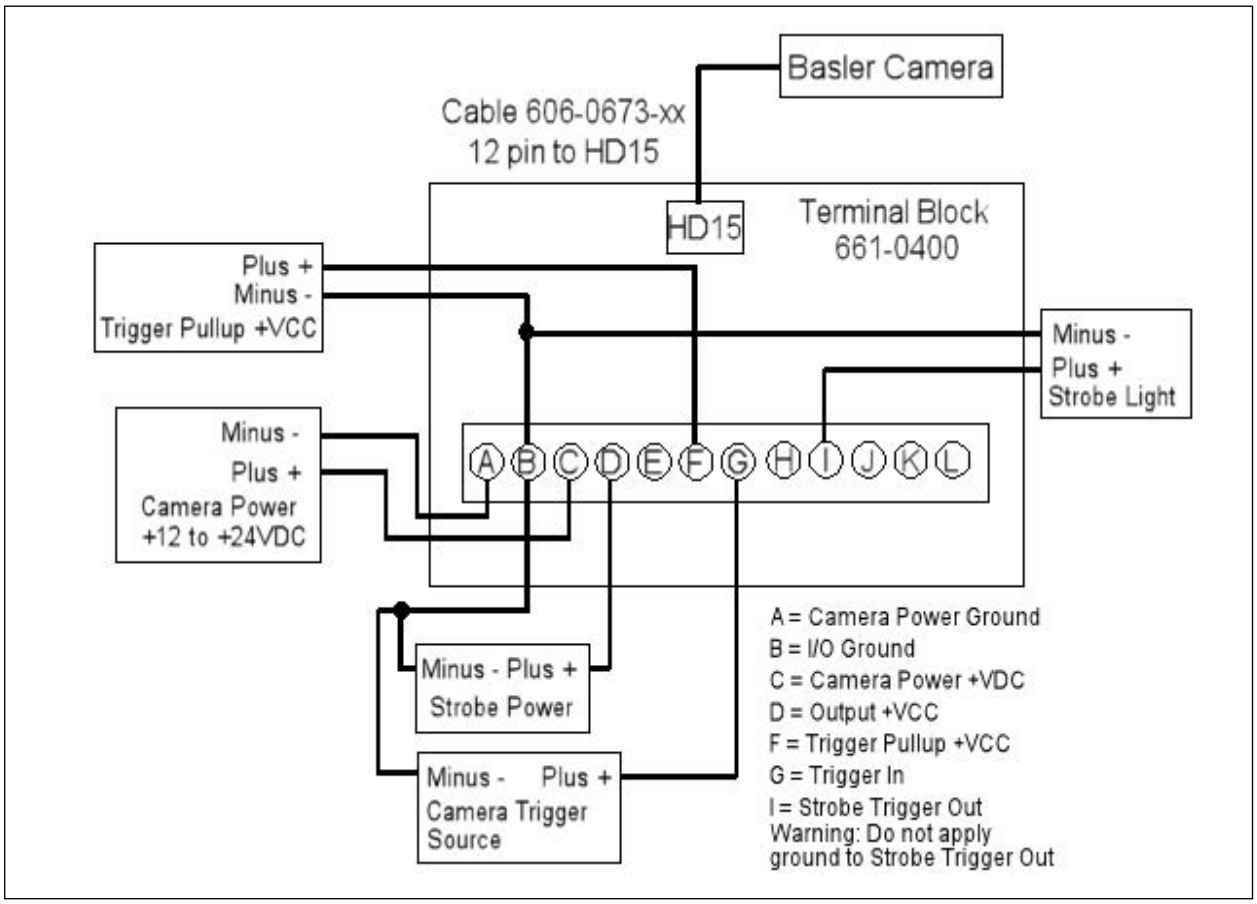
Trigger In Circuit



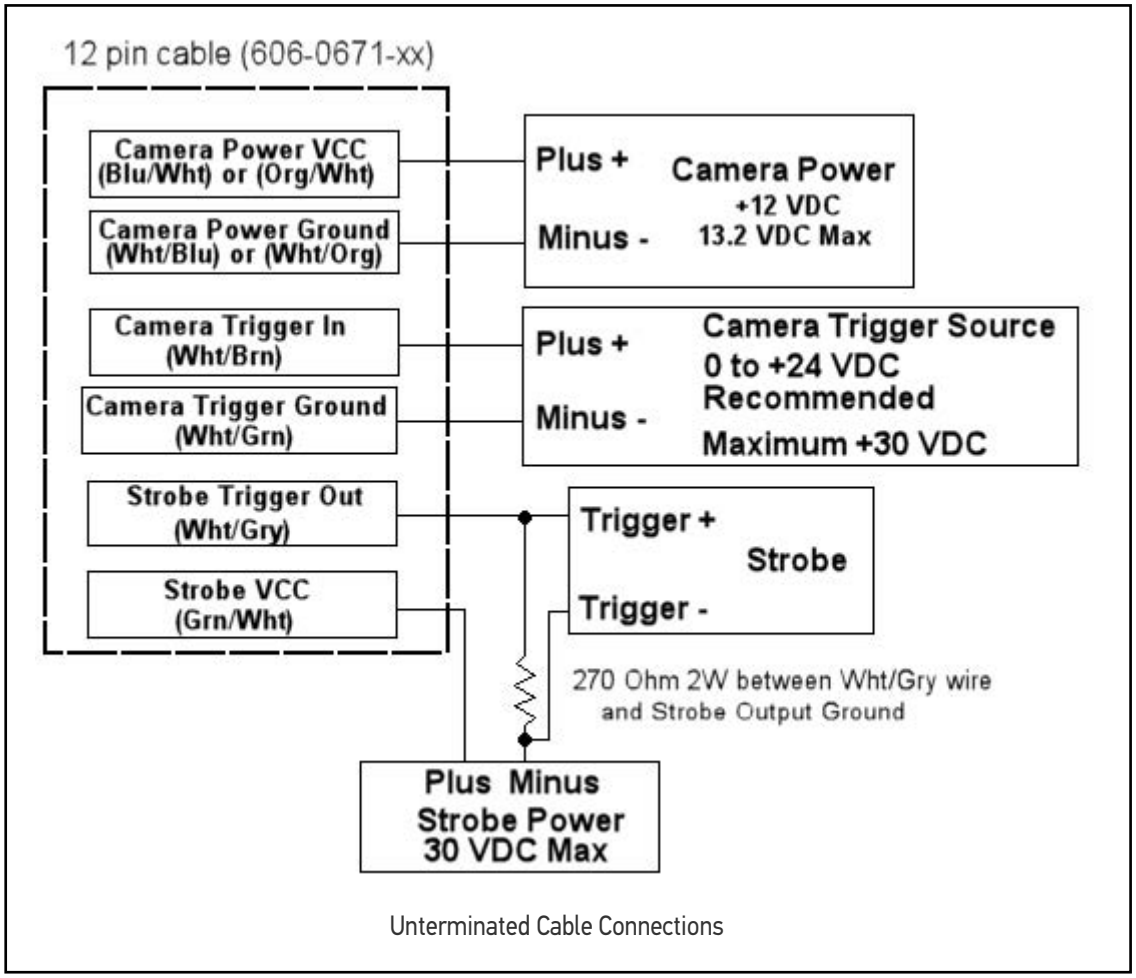
Strobe Trigger Out Circuit



Terminal Connections


Basler Camera
Cable 606-0673-xx
12 pin to HD15
HD15
Terminal Block
661-0400
Plus +
Minus -
Trigger Pullup +VCC
Minus -
Plus +
Strobe Light
Minus -
Plus +
Camera Power
+12 to +24VDC
A B C D E F G H I J K L
Minus - Plus +
Strobe Power
Minus - Plus +
Camera Trigger
Source
A = Camera Power Ground
B = I/O Ground
C = Camera Power +VDC
D = Output +VCC
F = Trigger Pullup +VCC
G = Trigger In
I = Strobe Trigger Out
Warning: Do not apply
ground to Strobe Trigger Out

Aviator Unterminated Cable Connections



Unterminated Cable Connections

SVS-Vistek Cameras (non-IP67 rated)

Dual Ethernet connection NOT SUPPORTED. We only support a single Ethernet connection so our frame rate may be less than the SVS-Vistek spec.

Evo and hr model cameras have dual Ethernet ports to support two Gigabit/sec image rates. The MX Industrial Vision Processors and IMPACT software do not support dual Ethernet connections, so the frame rate on these cameras may be lower than the frame rate published by SVS-Vistek.

MX_frame_rate = min (camera_spec, 125,000,000/(width*height))

Only the camera Ethernet connector furthest from the Hirose connector will work with the MX-E Industrial Vision Processor. If you connect a camera to the other connector, Impact will connect to the camera, but you cannot capture images and the error message “Image Capture Timeout” will be written in the system log.

NOTE: This section applies only to SVS-Vistek camera without an IP67 rating. For IP67 rated cameras (model ending in 67), see “SVS-Vistek Cameras (IP67 rated)” on page 65**.**

The following SVS-Vistek camera models are supported:

MODEL	MEGAPIXEL (MP)	COLOR	IMAGE HORIZONTAL	IMAGE VERTICAL	FPS (APPROX)	MINIMUM SOFTWARE VERSION REQUIRED
eco695MTLGEC	6	No	2752	2204	10.1	12.2
evo8051MFLGEA	8	No	3296	2472	21.8	12.2
eco815MTLGEC	9	No	3360	2712	7	12.2
eco834MTLGEC	12	No	4224	2838	5.5	12.2
hr1600MTLGEC	16	No	4896	3248	4	12.2

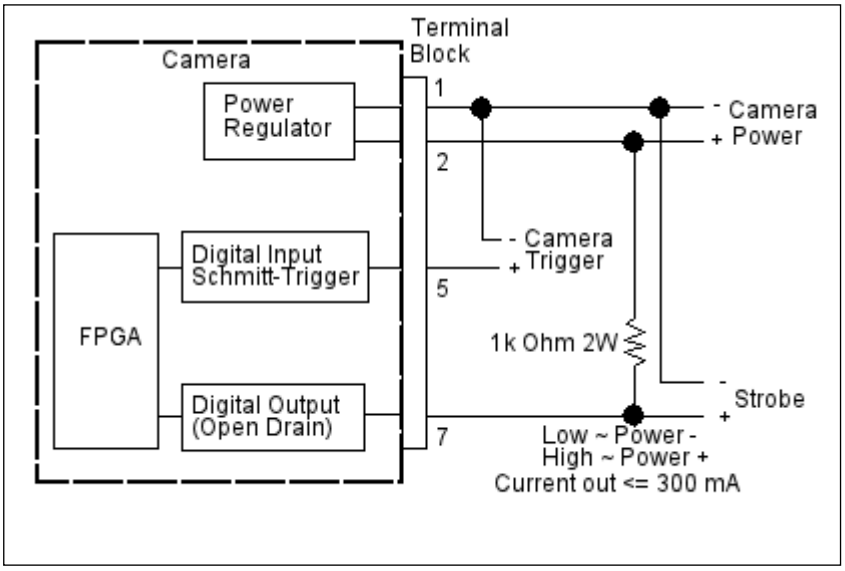
SVS-Vistek (non-IP67) Camera Connection

This camera uses two cables, one for Ethernet and one for power and trigger signals. For the Ethernet connection, use cable 606-0677-xx. To connect power and trigger signals, use a terminal block (248-0136) with the optional Hirose 12-pin to HD-15 camera cable (606-0673-xx).

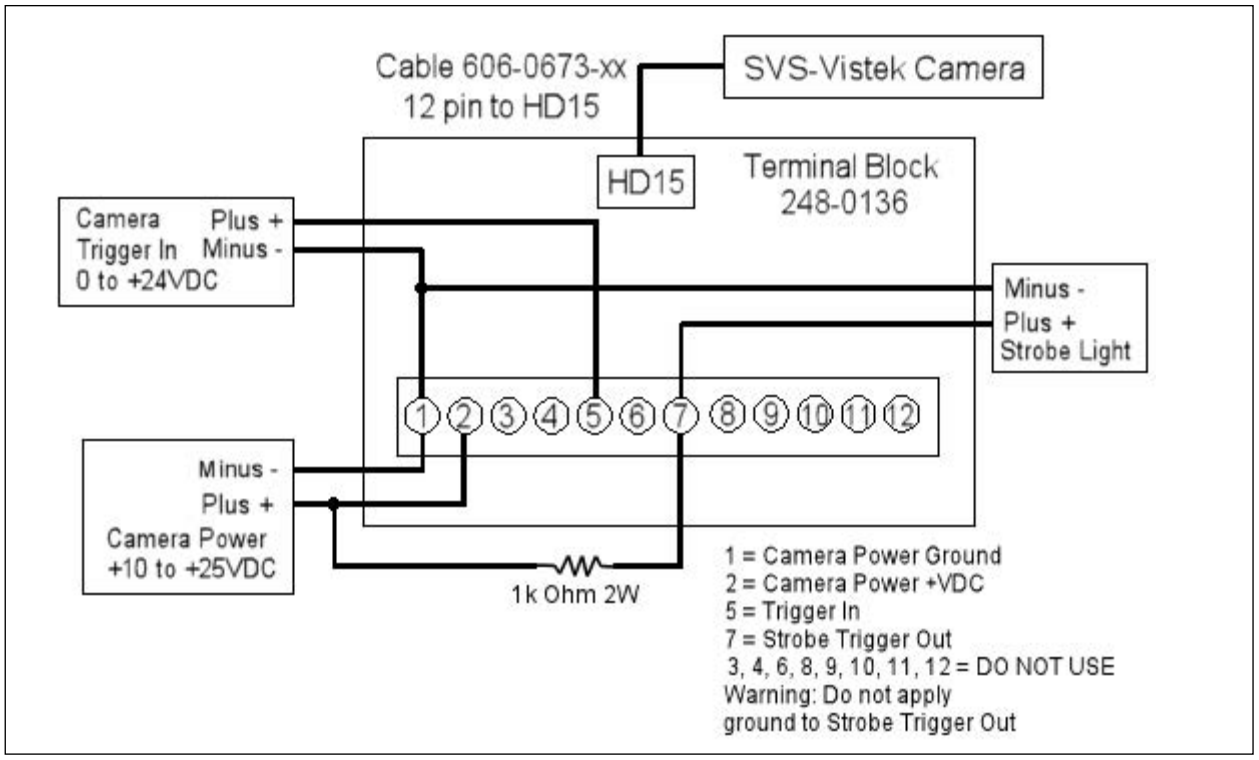
NOTE: Some older SVS-Vistek camera firmware versions are incompatible with Impact camera drivers 12.2 and newer. If you are having trouble connecting to an SVS-Vistek camera, then make sure that the camera firmware is updated to the latest version. The firmware updater can be found on the SVS-Vistek website in the Login Area.

TERMINAL	SIGNAL NAME	NOTES
1 (Wht/Blu)	Camera Ground	
2 (Wht/Org)	Camera Power	Min +10 VDC to Max +25 VDC
3 & 4	DO NOT USE	Not Currently Supported
5 (Wht/Grn)	Camera Trigger In	0 to +24 VDC
6	DO NOT USE	Not Currently Supported
7(Gry/Wht)	Trigger Out to Strobe	0 to +24 VDC; 300 mA Max
8, 9, 10, 11, 12	DO NOT USE	Not Currently Supported

SVS-Vistek Non-IP67 I/O Circuit



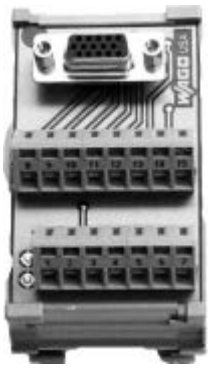
SVS-Vistek Non-IP67 Terminal Connections



SVS-Vistek Cameras (IP67 rated)

MODEL (GIGE - IP67)	MEGAPIXEL (MP)	COLOR	IMAGE HORIZONTAL	IMAGE VERTICAL	FPS (APPROX)	MINIMUM SOFTWARE VERSION REQUIRED
eco204MVGE67 eco204CVGE67	0.8	No Yes	1024	776	47	12.2
eco267MVGE67 eco267CVGE67	1.4	No Yes	1392	1040	25	12.2
eco274MVGE67 eco274CVGE67	2	No Yes	1600	1236	26.5	12.2
eco285MVGE67 eco285CVGE67	1.4	No Yes	1392	1040	34	12.2
eco414MVGE67 eco414CVGE67	0.3	No Yes	640	480	125	12.2
eco415MVGE67 eco415CVGE67	0.5	No Yes	782	494	86	12.2
eco424MVGE67 eco424CVGE67	0.3	No Yes	656	492	124	12.2
eco445MVGE67 eco445CVGE67	1.2	No Yes	1296	964	30	12.2
eco618MVGE67 eco618CVGE67	0.3	No Yes	656	494	160	12.2
eco655MVGE67 eco655CVGE67	5	No Yes	2448	2050	10	12.2
eco1050MTL-GEC67	1	No	1024	1024	56.1	12.2

SVS-Vistek (IP67) Camera Connection



This camera uses two cables, one for Ethernet and one for power and trigger signals. For the Ethernet connection, use cable 606-0677-xx.

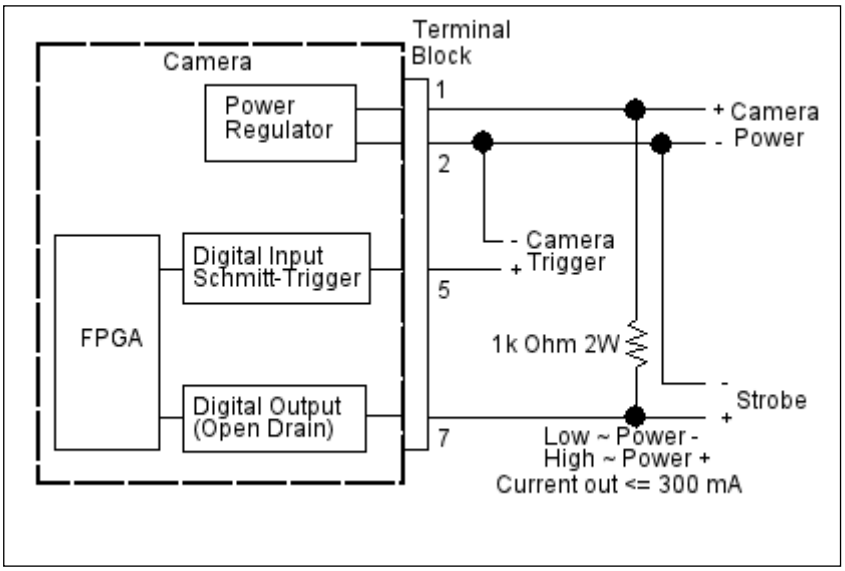
To connect power and trigger signals, use a terminal block (248-0136) with the optional M12 style 12-pin to HD-15 camera cable (606-0687-xx).

NOTE: Some older SVS-Vistek camera firmware versions are incompatible with Impact camera drivers 12.2 and newer. If you are having trouble connecting to an SVS-Vistek camera, then make sure that the camera firmware is updated to the latest version. The firmware updater can be found on the SVS-Vistek website in the Login Area.

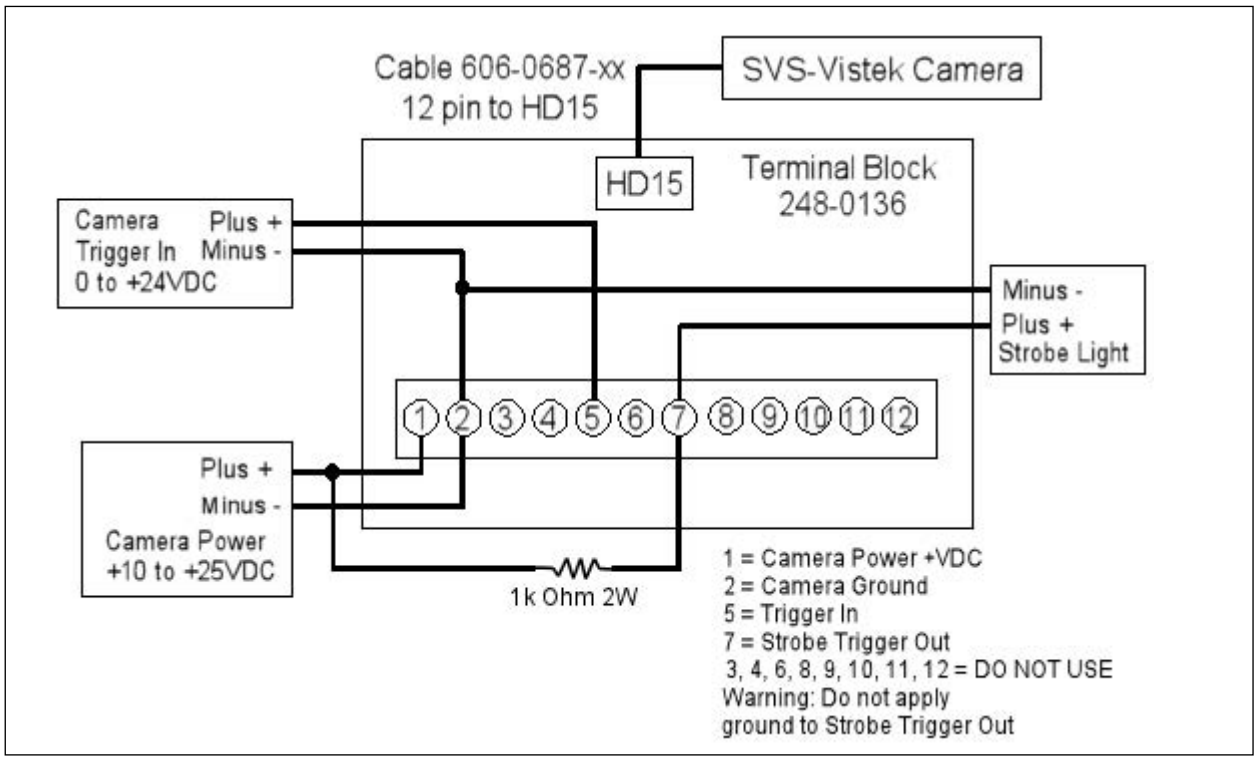
TERMINAL	SIGNAL NAME	NOTES
1 (Brown)	Camera Power	Min +10 VDC to Max +25 VDC
2 (Blue)	Camera Ground	
3 & 4	DO NOT USE	Not Currently Supported
5 (Pink)	Camera Trigger In	0 to +24 VDC
6	DO NOT USE	Not Currently Supported

TERMINAL	SIGNAL NAME	NOTES
7(Black)	Trigger Out to Strobe	0 to +24 VDC; 300 mA Max
8, 9, 10, 11, 12	DO NOT USE	Not Currently Supported

SVS-Vistek I/O Circuit



SVS-Vistek Terminal Connections



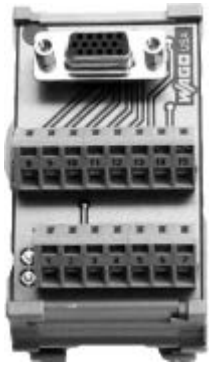
Dalsa Linea Lite Cameras

The following Dalsa Linea Lite camera models are supported:

MODEL	RESOLUTION	COLOR	IMAGE HORIZONTAL	MAX LINE RATE	MINIMUM SOFTWARE VERSION REQUIRED
959980015 CAM-DLL-L-2K-M-GE-M42 Camera	2048 x 2	No	2048	50 kHz	13.5.0

MODEL	RESOLUTION	COLOR	IMAGE HORIZONTAL	MAX LINE RATE	MINIMUM SOFTWARE VERSION REQUIRED
959980016 CAM-DLL-L-2K-C-GE-M42 Camera	2048 x 2	Yes	2048	25 kHz	13.5.0
959980017 CAM-DLL-L-4K-M-GE-M42 Camera	4096 x 2	No	4096	25 kHz	13.5.0
959980018 CAM-DLL-L-4K-C-GE-M42 Camera	4096 x 2	Yes	4096	12.5 kHz	13.5.0

Dalsa Linea Lite Camera Connection



This camera uses two cables, one for Ethernet and one for power and trigger signals. For the Ethernet connection, use cable 606-0677-xx.

To connect power and trigger signals, use a terminal block (248-0136) with one of these cables:

- 959930005 CAB-IO-15P-3-HD15-HD15 Cable, 3 Meter.
- 959930006 CAB-IO-15P-5-HD15-HD15 Cable, 5 Meter
- 959930007 CAB-IO-15P-10-HD15-HD15 Cable, 10 Meter

TERMINAL	LINEA LITE GIGE	DIRECTION	DEFINITION
1	Line 1+	In	RS-422[1] Input Port 1+
2	Line 1-	In	RS-422[1] Input Port 1-
3	Line 2+	In	RS-422[1] Input Port 2+
4	Line 2-	In	RS-422[1] Input Port 2-
5	Signals Ground		Signals Ground
6	Line 3+	In/Out	Configurable[2] IO Port 3+
7	Line 3-	In/Out	Configurable[2] IO Port 3-
8	Input Trigger Level	Out	
9	Input Trigger Level	Out	
10	PWR-GND		Camera Power Ground
11	Line 4+	Out	Configurable[3] IO Port 4+
12	Line 4-	Out	Configurable[3] IO Port 4-
13	Line 5+	Out	Configurable[3] IO Port 5+
14	Line 5-	Out	Configurable[3] IO Port 5-
15	PWR-VCC		Camera Power – DC +12 to +24 Vdc

[1]: Programmable RS422 termination

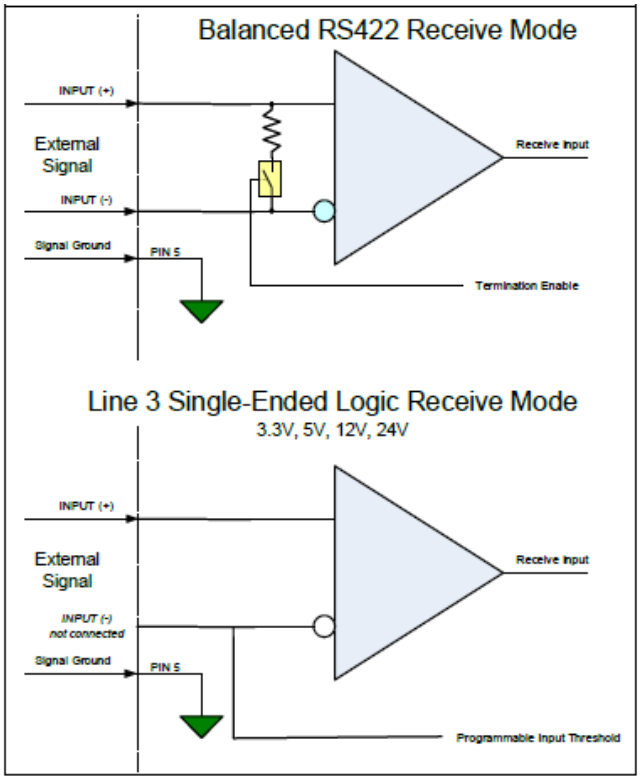
[2]: Line 3 is programmable as:

- Single ended input with programmable threshold
  0-24 V in (0-60 V tolerant)
  0-11 V threshold voltage
- RS422 In (external termination required)
- Rs422 Out
- 3.3 V single ended output

[3]: Line 4 and 5 are programmable as:
RS422
Single ended 3.3 V open collector output

Input Signals Electrical Specifications

External Inputs Block Diagrams:



External Input Overview:

- The input signals can be used as trigger acquisition event, counter or timestamp event, or integration control.
- The input signal can be improved by user programmable Input Line Debouncing Period from 0 to 255 µs, in 1 µs.

CAUTION: It is important to correctly configure external inputs before connecting external signals. Connecting higher voltage signals to inputs configured as RS422 may damage the inputs.

External Input Electrical Characteristics:

RS422 INPUTS	
Common Mode Input Voltage (Vcm)	-25 V min. – 25 V max.
Differential Input Signal Threshold	200 mV
Differential Input Signal Hysteresis	150 mV (Vcm = 0 V)

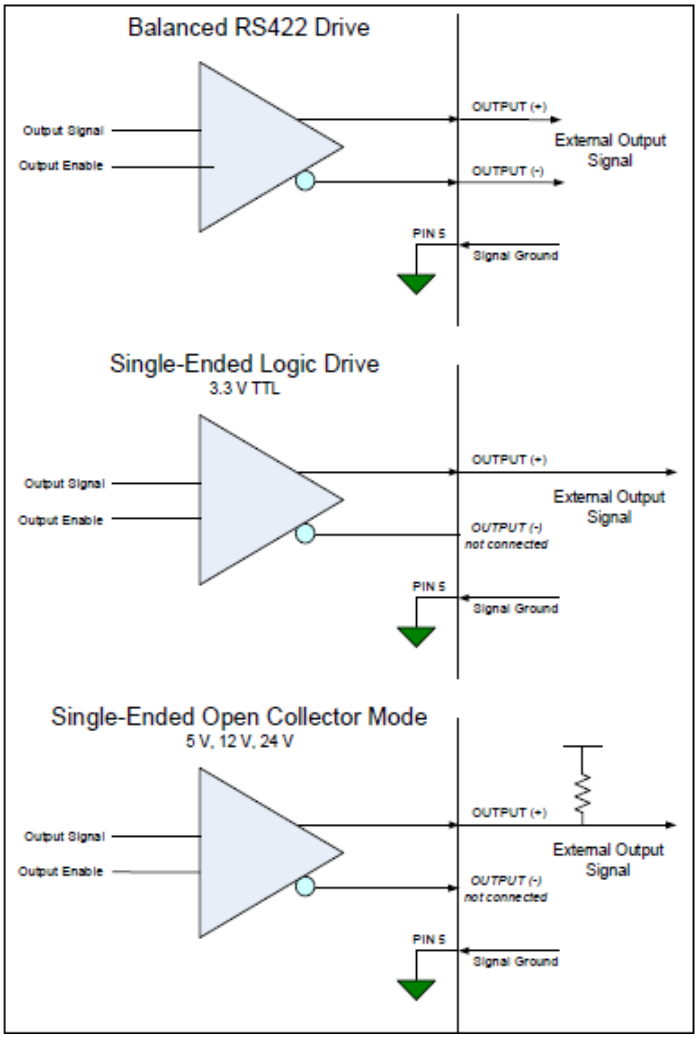
SINGLE-ENDED INPUTS (APPLIES TO LINE 3 ONLY)		
	Switching Voltage	
	Low to High	High to Low
3.3 V TTL	1.5 V	1.5 V
5.0 V TTL	2.5 V	2.5 V
12 V	6 V	6 V
24 V	11 V	11 V

External Input Timing Reference

INPUT LEVEL STANDARD	MAXIMUM INPUT FREQUENCY	MINIMUM PULSE WIDTH	SOURCE CURRENT REQUIREMENTS	MAXIMUM SIGNAL PROPAGATION DELAY AT 60°C Input Signal Direction	
LVTTL (3.3 V)	20 MHz	25 ns		0 to 3.3 V	< 100 ns
				3.3 V to 0	< 100 ns
TTL (5.0 V)	20 MHz	25 ns		0 to 5 V	< 100 ns
				5 V to 0	< 100 ns
12 V	20 MHz	25 ns		0 to 12 V	< 100 ns
				12 V to 0	< 100 ns
24 V	20 MHz	25 ns		0 to 24 V	< 100 ns
				24 V to 0	< 100 ns

Output Signals Electrical Specifications

External Outputs Block Diagrams:



External Output Details:

- The output signals can be used in programmable output mode such as strobe, event notification, etc.
- For the Single-Ended Open Collector outputs, the user supplied pull-up resistor value should be between 1 kΩ and 10 kΩ depending on supply rail. Resistor Wattage should be calculated accordingly.

- Outputs are open (disabled) on power-up with the default factory settings.
- A software reset will not reset the outputs to the open state if the outputs are active.
- A user setup configured to load on boot will not reset the outputs to the open state if the outputs are active.
- The output signals are designed to prevent an output signal glitch on power-up or polarity reversal.
- Protection Circuit – DC Ratings:
  Output protected against shorts to ground or other voltages
  Output maximum voltage of 26 V at 10 mA (at 60°C)

Usage Notes:

1. **Install Teledyne Dalsa Sapera SDK 8.7 or greater on the MX processor.**

2. **Camera IP address setting:**

   - Use Teledyne Dalsa Network Configuration Tool to set a persistent IP in the camera. The Impact feature of plug-and-play IP address setting is not supported by their SDK.
   - For CAM1 set the camera address to 172.31.1.2 and the mask to 255.255.255.0
   - For CAM2 set the camera address to 172.31.2.2 and the mask to 255.255.255.0
   - For CAM3 set the camera address to 172.31.3.2 and the mask to 255.255.255.0
   - For CAM4 set the camera address to 172.31.4.2 and the mask to 255.255.255.0

3. **Camera Type Assignment:**
   - On the Camera Setup Assign tab, select Camera Type = Dalsa Linea Lite.

4. **DIO triggers:**
   - Use Line 3 for frame triggers. (It is a single-ended trigger, so the signal input goes to Pin 6 and the signal ground to pin 5).
   - Use Line 1 for single phase line triggers and for quadrature line triggers phase A. (It is an RS-422 differential input. + goes to pin 1 and minus to pin 2).
   - Use Line2 for quadrature line trigger phase B. (It is an RS-422 differential input. + goes to pin and minus to pin 4).

5. **Digital Gain only:**
   - The analog gain setting on the Camera General tab is not available.
   - Digital gain is available, but can only be accessed in the properties tab.

6. **Demosaicing:**
   The only demosaicing method is “high def” i.e. camera-based.

7. **Advanced features not supported:**
   - The cameras support Flat Field Correction and PTP, but they are not supported by Impact.

SUPPORTED THIRD-PARTY CAMERA AND IMPACT SOFTWARE COMPATIBILITY

CAMERA MODEL	MINIMUM COMPATIBLE SW VERSION	NOTES
Basler – all Ace and Scout models	11.4.1.23 (GigE) 11.5.0.95 (USB)	Ace model numbers begin with “acA” and Scout model numbers begin with “scA.” (GigE and USB)
Basler – all Ace 2	13.0.5	Only Ace 2 R, GigE vision models are supported; advanced features of pro models are not available.
Basler avA1000-100gm Basler avA1000-100gc Basler avA1600-50gm Basler avA1600-50gc Basler avA1900-50gm Basler avA1900-50gc Basler avA2300- 25gm Basler avA2300-25gc	10.3.0.75	
acA4112-8gm	12.2.6	
acA5472-5gm	12.2.6	Rolling Shutter and Global Reset Release see “Camera basics” on page 25
acA5472-5gc	12.2.6	Rolling Shutter and Global Reset Release see “Camera basics” on page 25
Basler acA2500-14gm	11.0.0.213	Rolling Shutter and Global Reset Release see “Camera basics” on page 25
Basler ruL2098-10gc	11.5.0.95	
Basler raL8192-12gm Basler raL6144-16gm Basler raL4096-24gm Basler raL2048-48gm	11.7.0.111	
JAI SP-200000M-USB	11.8.0.97	
SVS-Vistek eco204 SVS-Vistek eco267 SVS-Vistek eco274 SVS-Vistek eco285 SVS-Vistek eco414 SVS-Vistek eco415 SVS-Vistek eco424 SVS-Vistek eco618 SVS-Vistek eco445 SVS-Vistek eco655	10.4.0.78	monochrome models

CAMERA MODEL	MINIMUM COMPATIBLE SW VERSION	NOTES
SVS-Vistek eco204 SVS-Vistek eco267 SVS-Vistek eco274 SVS-Vistek eco285 SVS-Vistek eco414 SVS-Vistek eco415 SVS-Vistek eco424 SVS-Vistek eco618 SVS-Vistek eco445 SVS-Vistek eco655	10.5.0.35	color models
SVS-Vistek eco1050MTLGEC67	11.2.0.83	monochrome model
SVS-Vistek evo8051MFLGEA	11.7.0.111	monochrome model
SVS-Vistek evo8051MFLGEC	11.8.0.97	monochrome model
SVS-Vistek eco series SVS-Vistek eco2 series SVS-Vistek hr series	11.8.0.97	eco series: All monochrome models All color models up to five megapixels evo hr series: All Monochrome models up to 16 megapixels (NOT the 29 megapixels camera) All color models up to 5 megapixels eco and hr series: only the Ethernet connector located furthest from the Hirose connector can be used
SVS-Vistek hr16000MTLGEC	11.8.0.97	monochrome model
SVS-Vistek exo273MGE SVS-Vistek exo273CGE SVS-Vistek exo174MGE SVS-Vistek exo174CGE SVS-Vistek exo249MGE SVS-Vistek exo249CGE SVS-Vistek exo264MGE SVS-Vistek exo264CGE	13.1.2	
Dalsa Linea Lite: L2-GM-02K05B-00-A L2-GC-02K02B-00-A L2-GM-04K02B-00-A L2-GC-04K01B-00-A	13.5.0	Linear Camera; Monochrome and Color Models

CAMERA MODEL	MINIMUM COMPATIBLE SW VERSION	NOTES
Basler: acA1920-40gm acA1920-40gc	13.5.0	Monochrome and Color Models

CHAPTER 4
TYPICAL LAYOUTS

The following typical layouts refer to system hardware configurations. However, they also require the correct setup of the software configuration parameters.

NOTE: All software configurations are made through Impact which connects to the reader through the on-board Ethernet interface.

INTRODUCTION

An overview of the connections to the MX-E90 Industrial vision processor is shown in the Figure 1: Camera connections via cable 606-0677-xx, peripheral devices connected via LAN, camera trigger device via terminal block 661-0399 and I/O application management system via terminal block 248-0110.

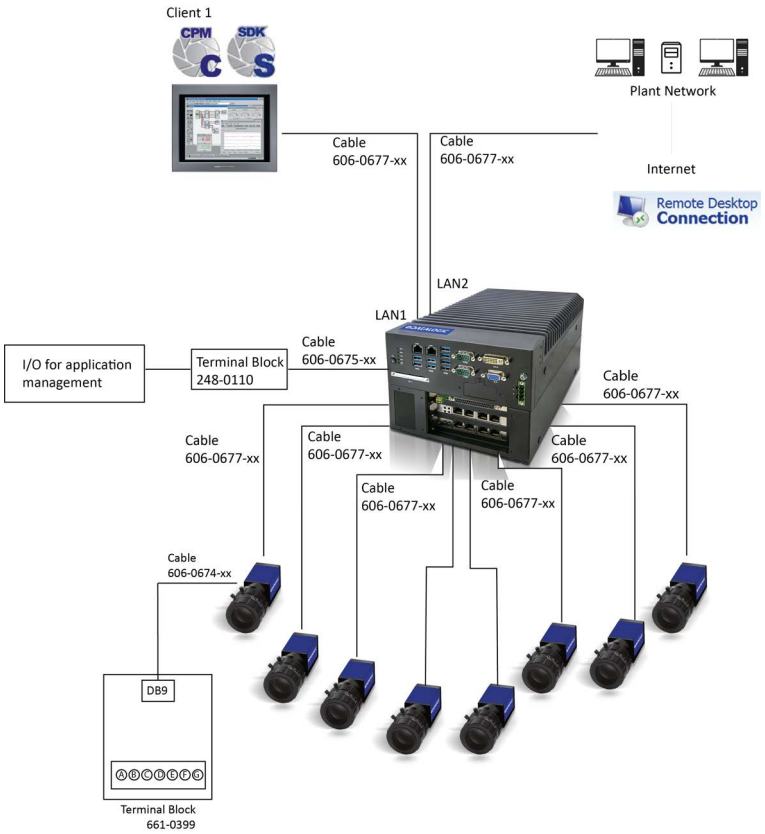


Figure 1 An overview of the connections to the MX-E90 Industrial Vision processor

ETHERNET CONNECTION

Camera Connections

The Industrial Vision Processor MX-E90 has up to eight camera connections. CAM1 through CAM8 are connected using a Cable 606-0677-xx. Camera Triggers can be set either with or without the terminal block.

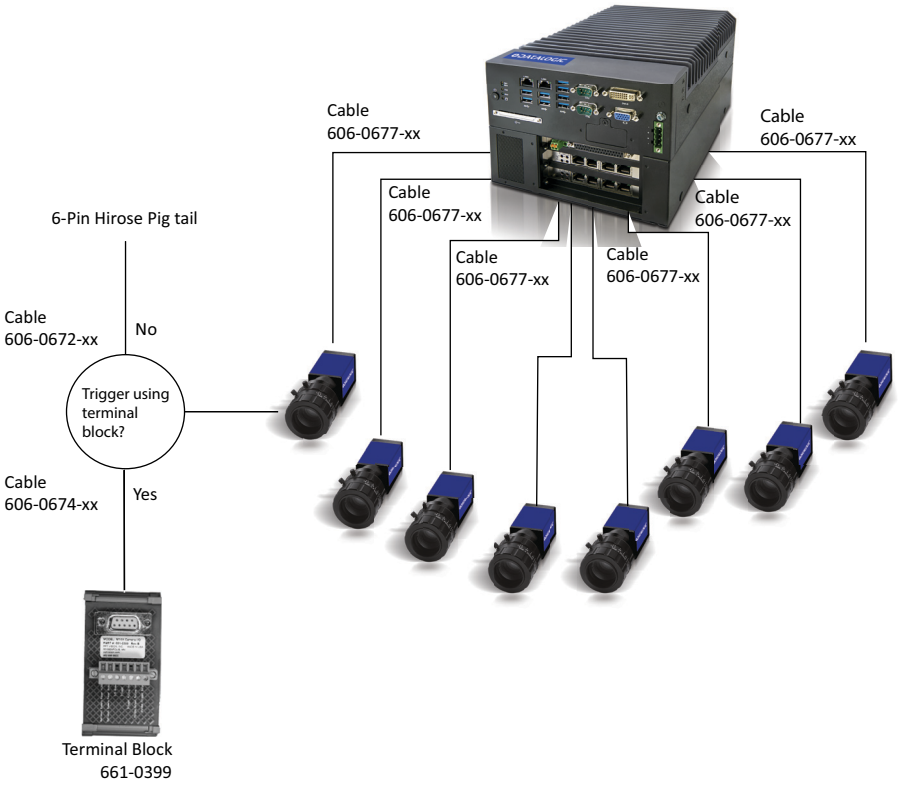


Figure 2 Camera Connections

LAN Connections

TCP/IP Protocol

The LAN connections provide connectivity to external devices (if needed). The following layout shows various peripheral devices connected via TCP/IP.

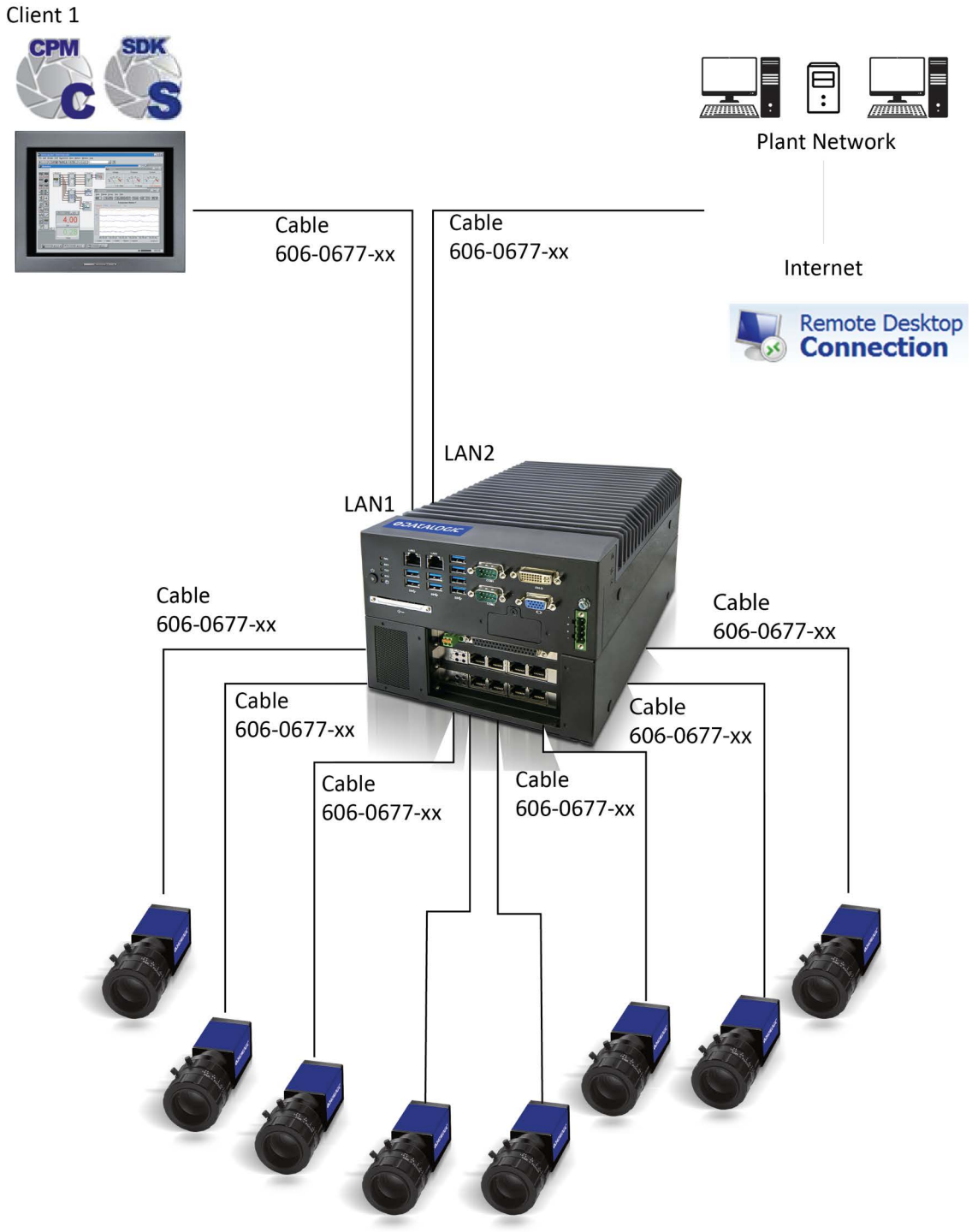


Figure 3 External LAN Connections using LAN1 and LAN2 (Basic configuration)

LAN1

The IP address of LAN1 must be on the same subnet as the Vision device. Typical application of LAN1 is to establish a communication with other Impact Devices.

LAN2 (Basic configuration)

Using the LAN2 it is possible to communicate with the Plant Network and through this, to create a remote desktop session via Internet.

Profinet protocol

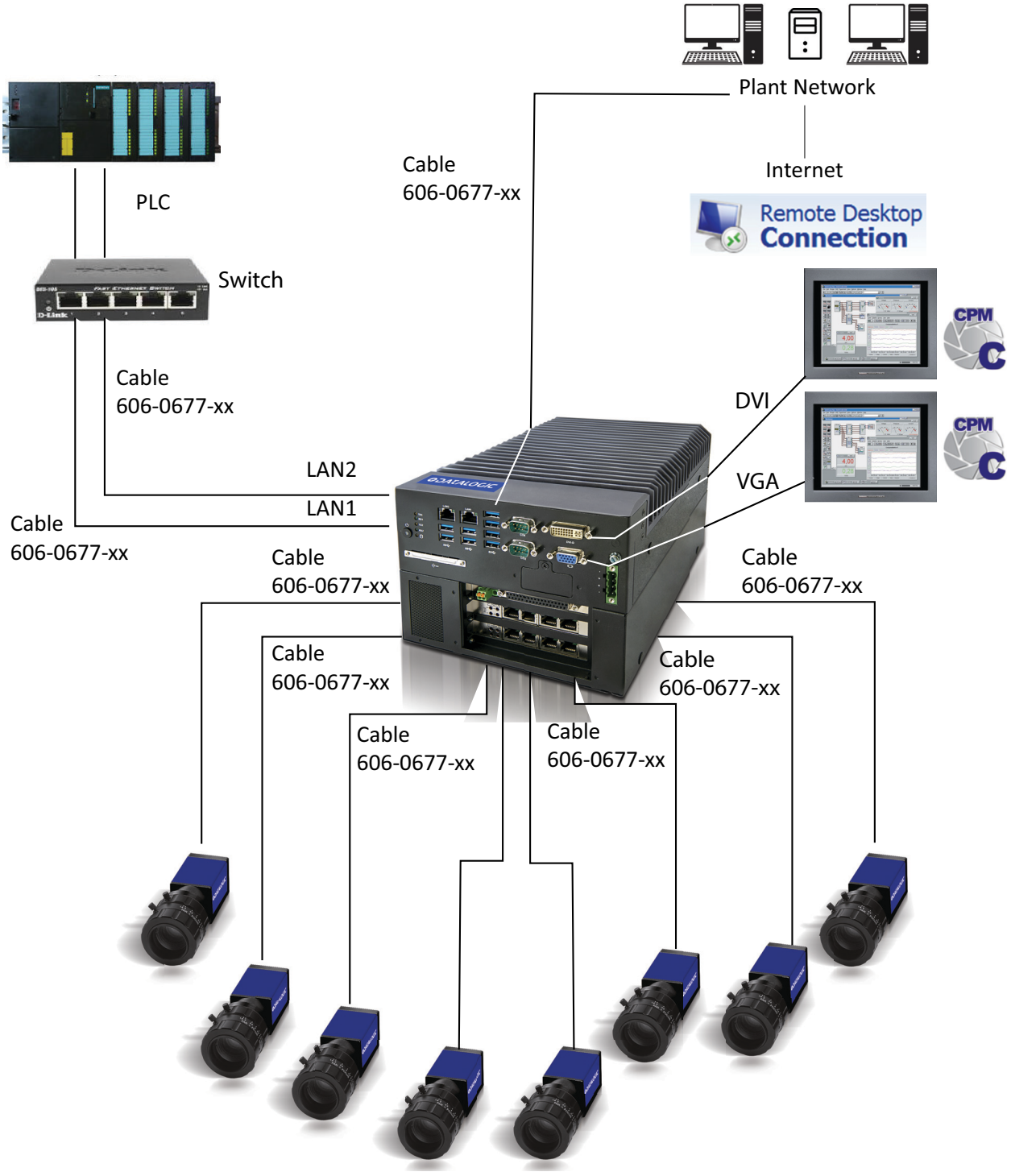


Figure 4 Profinet configuration using LAN1 configured as Profinet Station 1, LAN2 configured as Profinet Station 2 and VGA and DVI ports

LAN1

Is connected to the PLC through the switch. For more information about LAN1 see Impact Reference Guide (PROFINET Appendix).

LAN2

Is connected to the PLC through the switch. For more information about LAN2 see Impact Reference Guide (PROFINET Appendix).

USB to Ethernet

With the USB to Ethernet adapter it is possible to use additional LAN ports to communicate with the Plant Network and through this, to create a remote desktop session via Internet. For more information see “PROFINET I/O: external port” on page 8.

VGA/DVI

VGA and DVI ports are used to connect MX-E90 to an external display.

SERIAL CONNECTION

Use the serial connection to communicate with a PLC using a vision device.

COM 1 is controlled by Vision Device 1

COM 2 is controlled by Vision Device 2

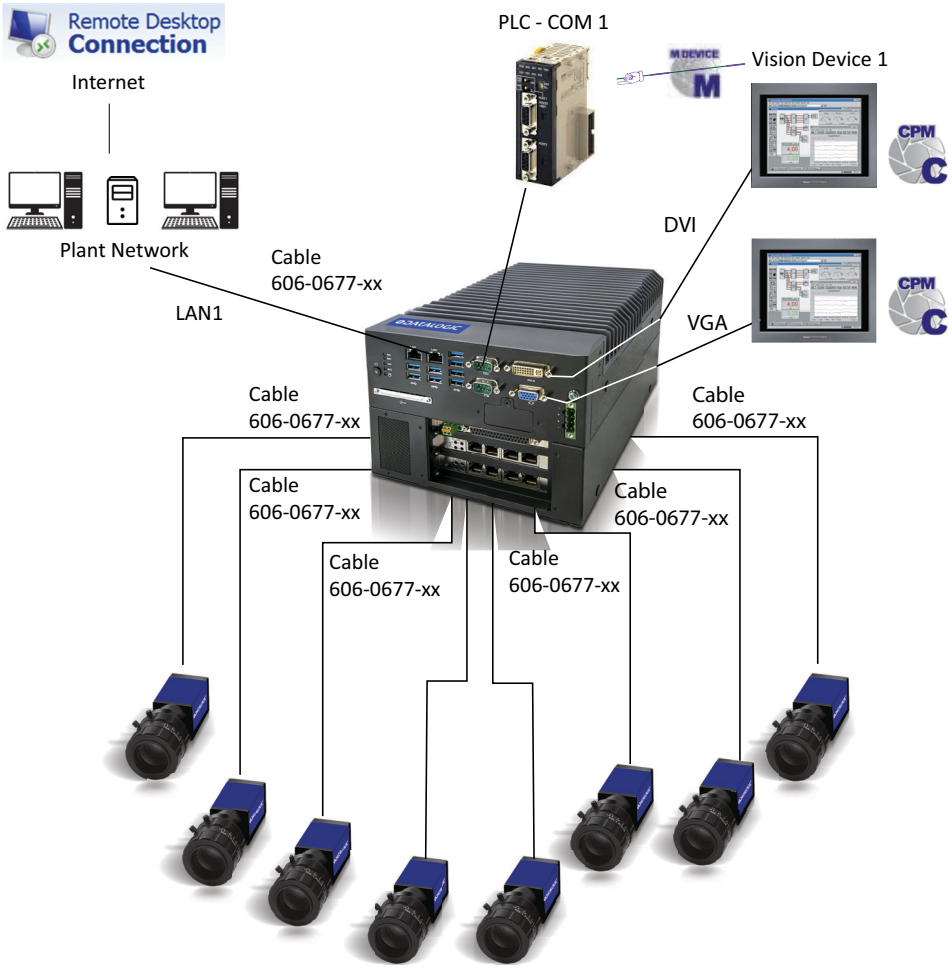


Figure 5 - Serial Connection with PLC connected to COM 1, controlled by Vision Device 1

USB to COM

With the USB to COM adapter it is possible to use additional COM ports to communicate with other vision devices (Vision Device 3 to Vision Device 8).

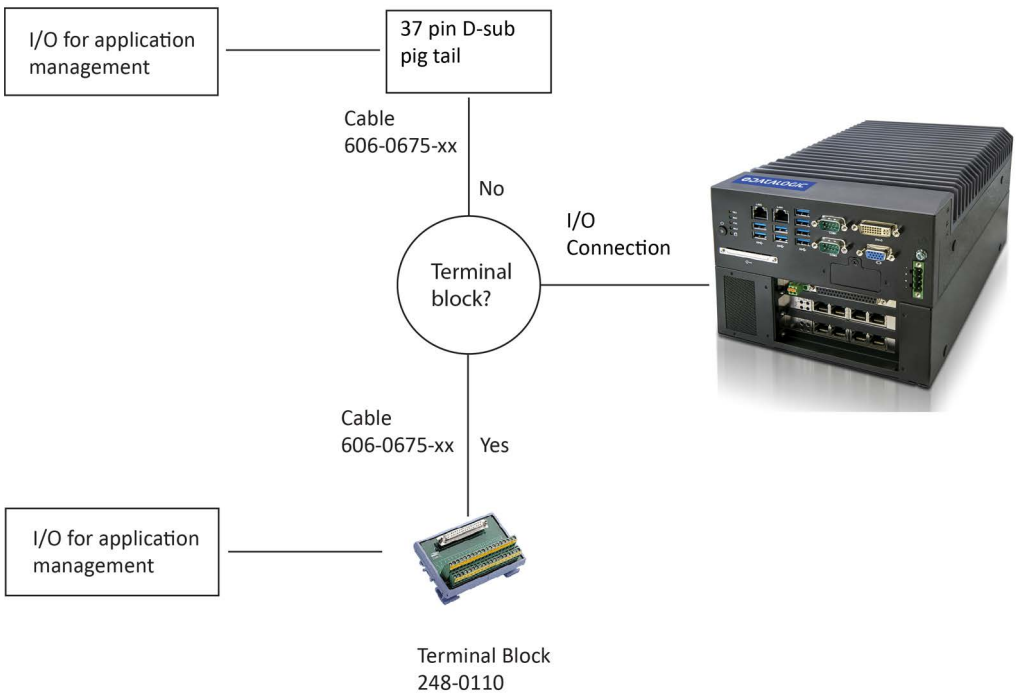
Additional serial ports for Vision Devices will connect to the defined COM port if the COM port is available when the Vision Device starts as follows:

Vision Device1 -> COM1 (factory installed)
Vision Device2 -> COM2 (factory installed)
Vision Device3 -> COM3 (user installed)
Vision Device4 -> COM4 (user installed)
Vision Device5 -> COM5 (user installed)
Vision Device6 -> COM6 (user installed)
Vision Device7 -> COM7(user installed)
Vision Device8 -> COM8 (user installed)

CHAPTER 5
INDUSTRIAL VISION PROCESSOR I/O

There are three versions of the MX-E90 Industrial Vision Processor, one with 8 GigE camera ports - the model number contains a “8” (for example MX-E90-8-B-2), one with 4 GigE camera ports - the model number contains an “4” (for example MX-E90-4-B-2) and one with 2 GigE camera ports - the model number contains an “2” (for example MX-E90-2-B-2).

This section discusses the MX-E90 Industrial Vision Processor I/O scheme. Refer to this section for all specifications when wiring your inputs and outputs into the Industrial Vision Processor..



NOTE: Your MX-E90 Industrial Vision Processor does not provide a voltage source for inputs and outputs – it must be provided by an external source. Refer to the module tables below for more voltage requirement information.

NOTE: The Trigger Signal and Strobe Output for M-Series cameras are separate and not part of the MX-E90 Industrial Vision Processor inputs and outputs. See “MX-E90 Cameras” on page 24 **for details.**

General Operation

Input NPN/PNP selection is determined by the connection of Input Common (ECOM) to +VDC or GND.

Output NPN/PNP selection is determined by the I/O selection in VPM_Settings_Communication.

Each output is limited to 350mA by a polyswitch self-resetting fuse.

INDUSTRIAL VISION PROCESSOR I/O CONNECTION

To connect MX-E90 Industrial Vision Processor input and output signals use either cable 606-0675-xx (37 pin D-sub Male to Male Cable) with terminal block 248-0110 or remove one end (to create pigtail) with no terminal block. Use shielded cable for all connections. Inputs and outputs are isolated.

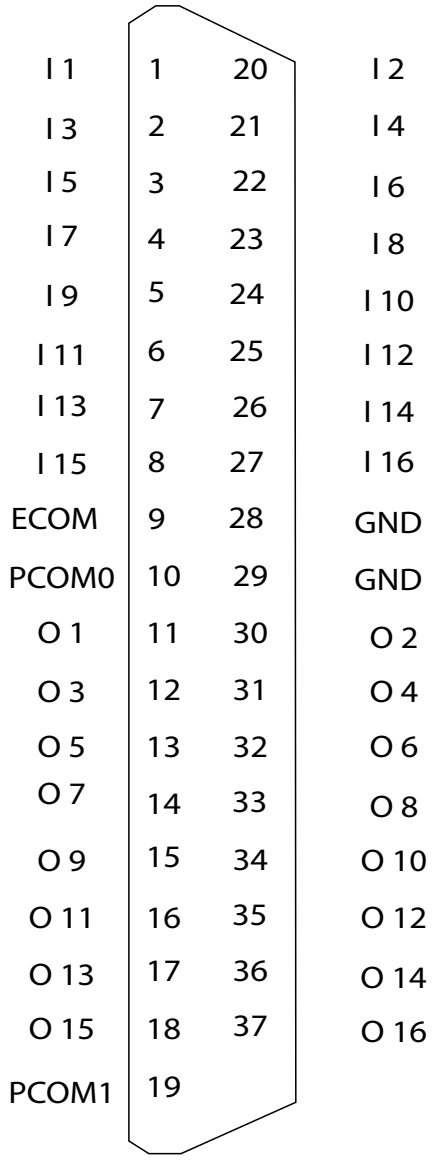
CAUTION: Do not connect or disconnect the cable while power is on.

Current configurable NPN (sinking) or PNP (sourcing) I/O.

CONNECTOR OR TERMINAL NUMBER	COLOR CODE	SIGNAL NAME	PIN NAME
1	Black	Input 1	I 1
2	Brown	Input 3	I 3
3	Red	Input 5	I 5
4	Orange	Input 7	I 7
5	Yellow	Input 9	I 9
6	Green	Input 11	I 11
7	Blue	Input 13	I 13
8	Purple	Input 15	I 15
9	Gray	Common pin for external source or ground of Input 1 to Input 16	ECOM
10	White	NPN: common pin for connecting inductive loads of Output 1 to Output 8 PNP: common pin for external voltage of Output 1 to Output 8	P COM0
11	Pink	Output 1	O 1
12	Light Green	Output 3	O 3
13	Black/ White	Output 5	O 5
14	Brown/ White	Output 7	O 15

CONNECTOR OR TERMINAL NUMBER	COLOR CODE	SIGNAL NAME	PIN NAME
15	Red/White	Output 9	O 9
16	Orange/ White	Output 11	O 11
17	Green/ White	Output 13	O 13
18	Blue/White	Output 15	O 15
19	Purple/ White	NPN: common pin for connecting inductive loads of Output 9 to Output 16 PNP: common pin for external voltage of Output 9 to Output 16	P COM1
20	Red/Black	Input 2	I 2
21	Orange/ Black	Input 4	I 4
22	Yellow/ Black	Input 6	I 6
23	Green/ Black	Input 8	I 8
24	Gray/Black	Input 10	I 10
25	Pink/Black	Input 12	I 12
26	Pink/Red	Input 14	I 13
27	Pink/Blue	Input 16	I 16
28	Pink/Green	Isolated ground	GND
29	Light Blue	Isolated ground	GND
30	Light Blue/ Black	Output 2	O 2
31	Light Blue/ Red	Output 4	O 4
32	Light Blue/ Blue	Output 6	O 6
33	Light Blue/ Green	Output 8	O 8
34	Gray/Red	Output 10	O 10
35	Gray/Green	Output 12	O 12
36	Purple/ Black	Output 14	O 14
37	Blue/Black	Output 16	O 16

Pin Assignment



Industrial Vision Processor Inputs

The MX-E90 Industrial Vision Processors contain sixteen general-purpose input connections.

Two inputs serve as both event and polled inputs (Input 1 and Input 2). The remaining inputs are polled. The event input is interrupt-driven which means that a change of state on the input will immediately cause an action and any inspection task that uses that input will be queued to run. Polled input means that the input's status is checked based on conditions defined in the inspection task.

Interrupt-driven input is edge-triggered and the duration of the input pulse must be longer than the debounce time. The active trigger edge (rising, falling, or both), input pulse duration, and debounce, are all configured in the Vision Program Manager Settings icon.

This table describes the input characteristics.

Format	Opto-coupler isolated input
Input Resistance (nominal)	3.21k @
On Current	>3mA

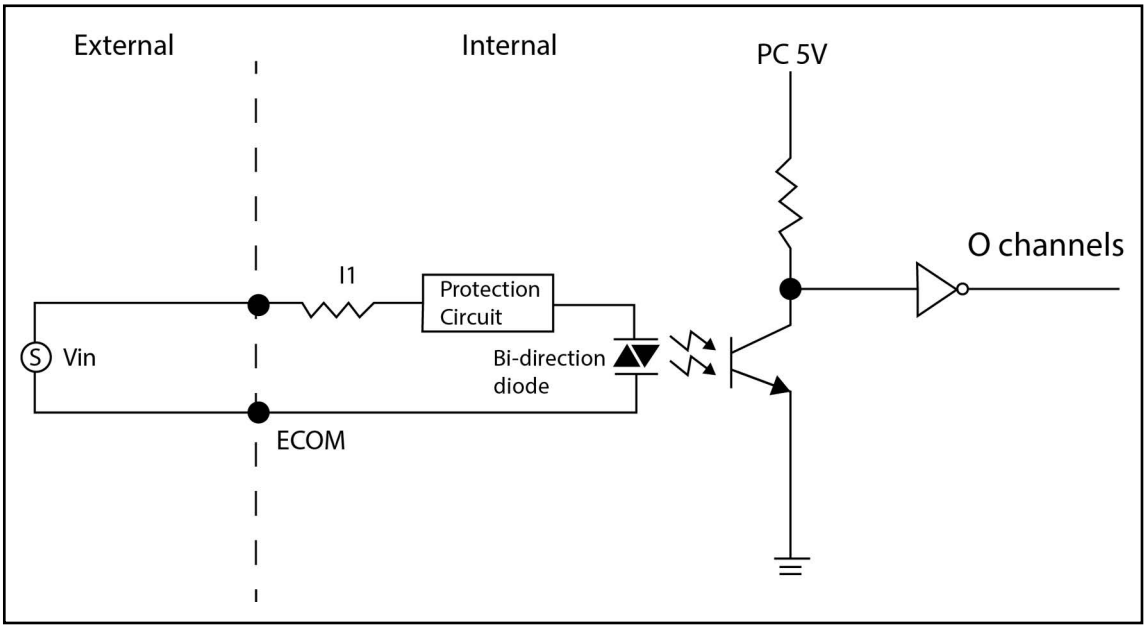
Off Current	<1mA
Current Maximum	8.5mA @30 VDC
Input Voltage	Logic 0: 3V max Logic 1: 10V min (30V max) or dry contact.
Isolation Protection	2500 VDC
Optical Isolation Response Time	100 µs
Overvoltage protection	70 VDC
Input current	3.28mA @ 12VDC 6.71mA @24VDC

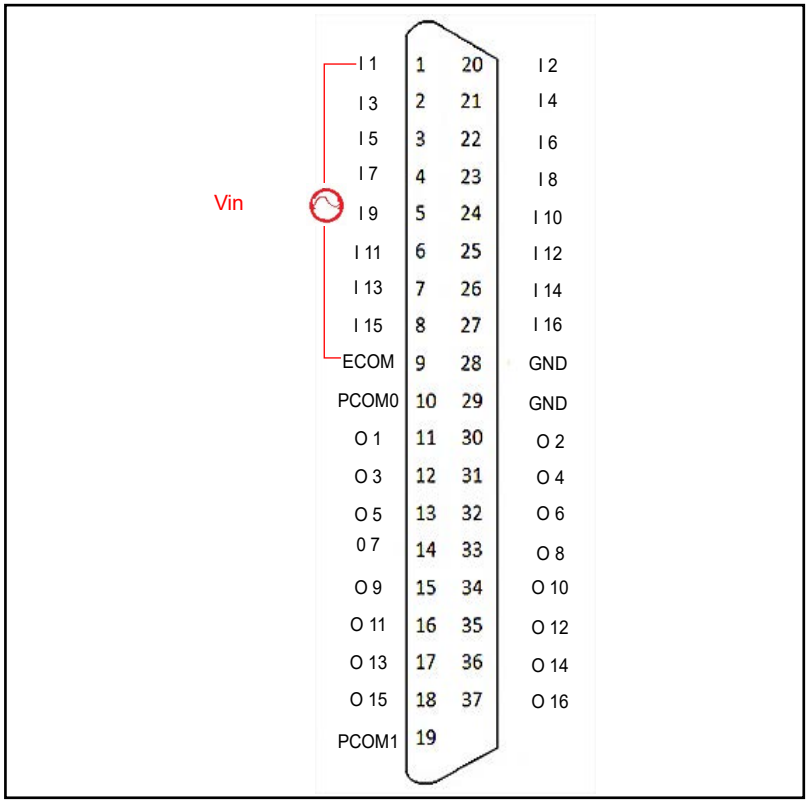
Input Wiring

NOTE: All connections to inputs must be made using properly grounded shielded cable.

Input Circuit

The diagram below shows how to wire a sensor to a general purpose or event input.





Industrial Vision Processor Outputs

The MX-E90 Industrial Vision Processors contain sixteen general-purpose output connections. The output come equipped with a MOSFET, polyswitch (for current protection) and integral suppression diode for using with inductive loads. If an external voltage (5-40VDC) is applied to an isolated output channel, the current will flow from the external voltage source to the card.

The table below describes the output's electrical characteristics.

Format	Opto-coupler isolated open emitter output
Load Voltage	5-40 VDC
Load Current	350 mA per channel (maximum)
Isolation Protection	2500 VDC
Residual Voltage Output On	2 V or less (output current ≤mA)
Optical Isolation Response Time	100 µs

NOTE: An external power source is required to power an output load. The outputs are merely switches that are open or closed. All output connections must use properly grounded and shielded cable.

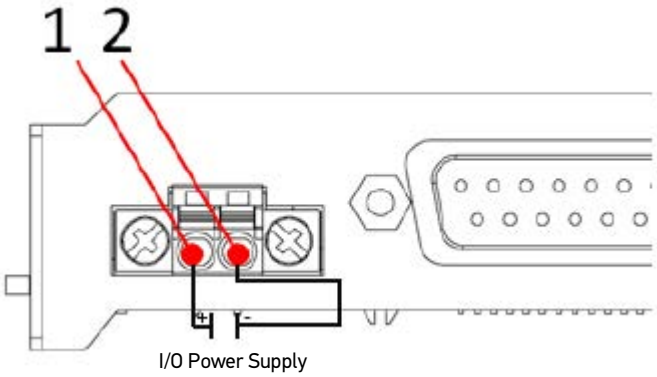
NOTE: The Trigger Signal and Strobe Output for M-Series and E-Series cameras are separate and not part of the MX-E90 Industrial Vision Processor inputs and outputs. See "MX-E90 Cameras" on page 24 for details.

Addition Digital Output Total Current Capability

The spring clamp connector on the I/O Card provides two extra connections that are equivalent to the GND/PCOM pin on the 37-pin connector and are used to increase the current tolerance on the I/O Card. The spring clamp pins should be connected whenever the combined total output current is higher than 3.2A.

The pin assignments are as follows:

- Pin 1: PCOM, used in source type (PNP) connections
- Pin 2: GND, used in sink type (NPN) connections

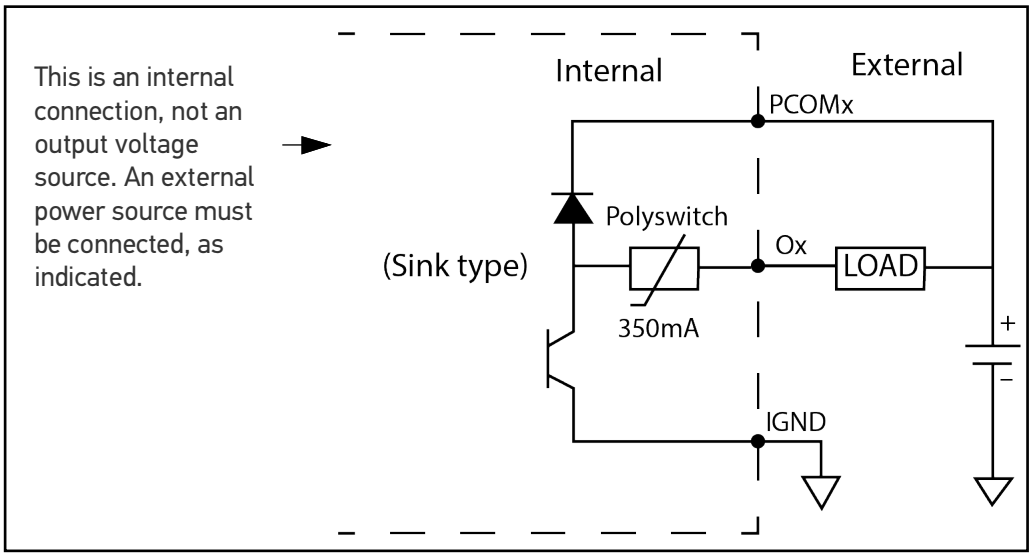


Spring Clamp Connector Pin Definition

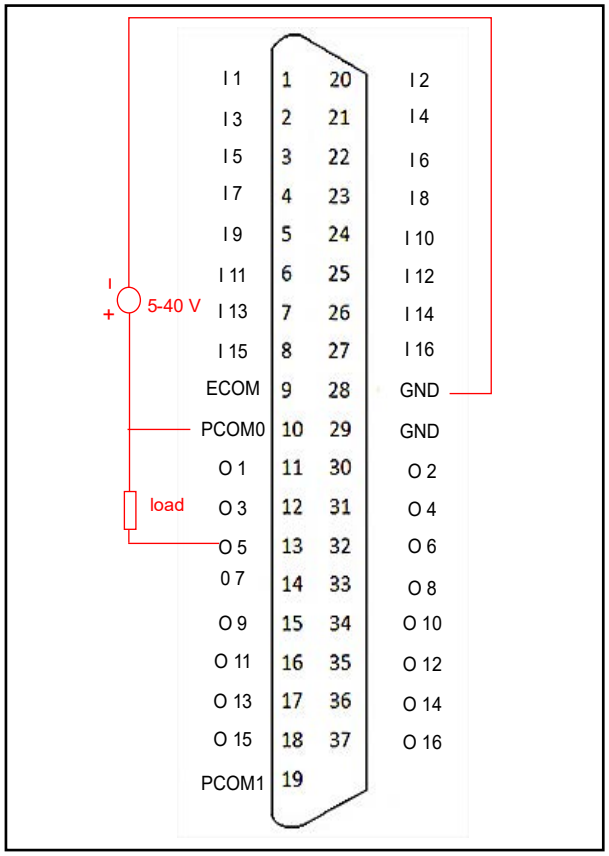
Output Wiring

Current Sinking (NPN) Output Circuit

The diagrams below show internal circuit diagrams and how to wire Industrial Vision Processor outputs.



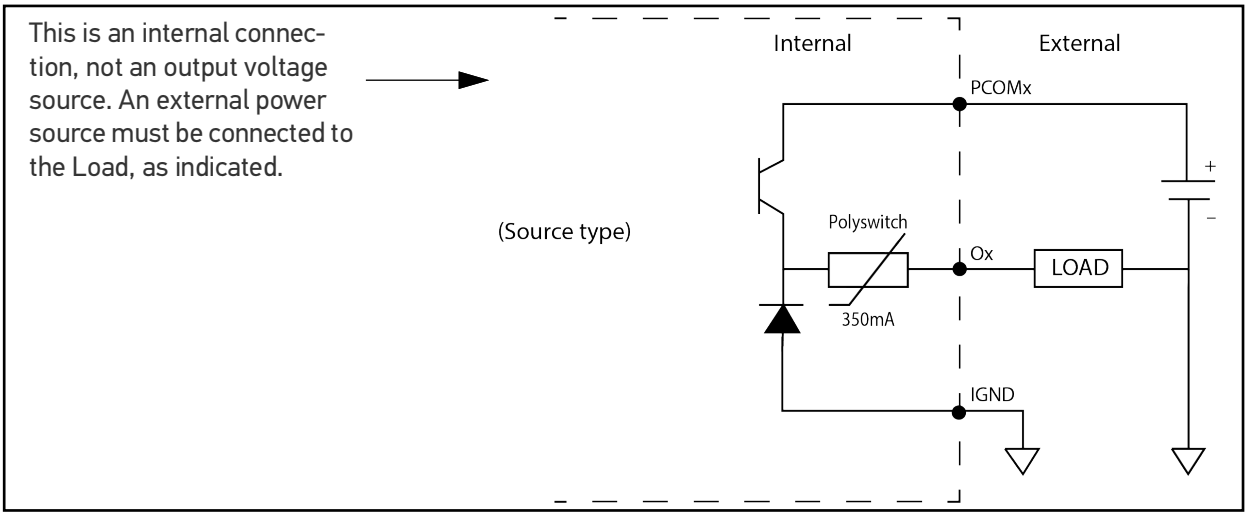
CAUTION: To prevent output damage, all inductive loads must have noise suppressors connected directly across the load, as close to the load as possible.



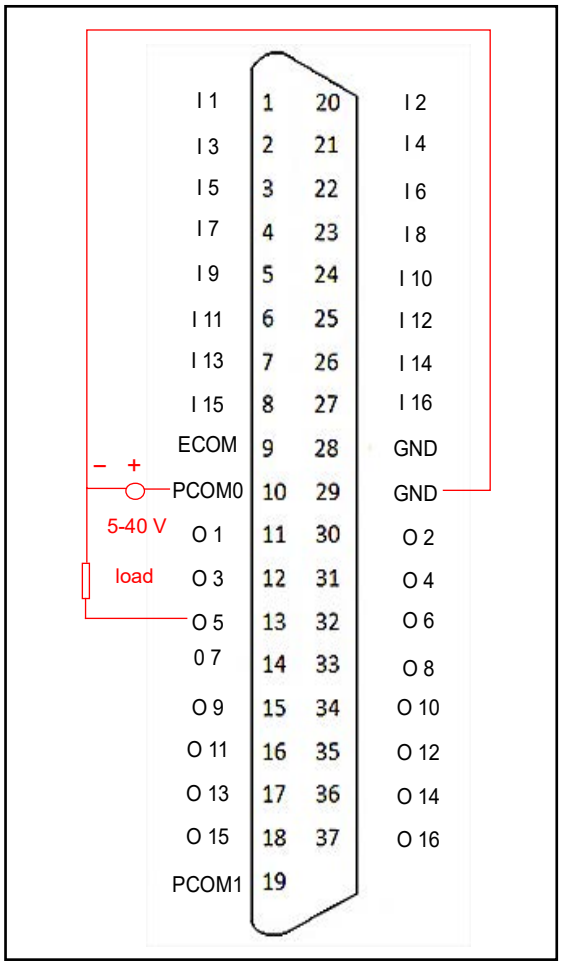
Current Sourcing (PNP) Output Circuit

The diagrams below show internal circuit diagrams and how to wire processor outputs.

This is an internal connection, not an output voltage source. An external power source must be connected to the Load, as indicated.



CAUTION: To prevent output damage, all inductive loads must have noise suppressors connected directly across the load, as close to the load as possible.


I 1
1
20
I 2
I 3
2
21
I 4
I 5
3
22
I 6
I 7
4
23
I 8
I 9
5
24
I 10
I 11
6
25
I 12
I 13
7
26
I 14
I 15
8
27
I 16
ECOM
9
28
GND
PCOM0
10
29
GND
O 1
11
30
O 2
O 3
12
31
O 4
O 5
13
32
O 6
O 7
14
33
O 8
O 9
15
34
O 10
O 11
16
35
O 12
O 13
17
36
O 14
O 15
18
37
O 16
PCOM1
19
5-40 V
load

CHAPTER 6
CABLE REFERENCE

This chapter documents MX-E90 Industrial Vision Processor and Camera cable assemblies.

INDUSTRIAL VISION PROCESSOR CABLES

The following cables connect different hardware devices to the industrial visual Industrial Vision Processor.

Power Supply

This equipment is to be powered by a Listed power supply for the U.S. and Canada, or a power supply that meets the requirements for use where either IEC 60950 or EN60950 is applicable.

See "Power Supply Connection" on page 19 for more details on wiring the power supply cable.

Ethernet

An Ethernet cable (Part number 606-0677-xx) is used to connect the MX-E90 Industrial Vision Processor to the GigE camera and between the Industrial Vision Processor and any external network. The last two digits of the part number indicate the cable length in feet. We recommend you use shielded Cat5e Ethernet cable or better to connect the camera and the Industrial Vision Processor. Cat6 cable is required for distances greater than 25 meters. Using any other cable may cause intermittent data transmission.

A crossover cable is not required because the Ethernet ports are auto-negotiating; that is they can tell the difference between a peer-to-peer connection and a router/switch connection and they configure themselves and the communications to suit the environment.

Input/Output

The terminal block and cable for connecting MX-E90 Industrial Vision Processor are listed in the table below. For connection diagrams, see "Industrial Vision Processor I/O Connection" on page 81. The last two digits of the part number indicate the cable length in meters.

CONNECTOR TYPE	PART NUMBER
Terminal Block - 37 pin D-sub to Screw Terminal	248-0110
I/O Cable - 37 pin D-sub Male to Male Cable (for use with above terminal block)	606-0675-xx

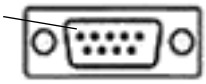
CONNECTOR TYPE	PART NUMBER
37 pin D-sub Male to pigtail (remove one end)	606-0675-xx

Serial Port

A standard serial cable is used to connect the Industrial Vision Processor to the serial port on an external device (e.g. terminal, PLC, motion controller, data recorder). This may require using a null modem cable or adapter. Impact software supports RS-232 communication protocol only.

PIN NUMBER	SIGNAL NAME
1	No Connection
2	Received Data (RxD)
3	Transmitted Data (TxD)
4	No Connection
5	Signal Ground (GND)
6	No Connection
7	Request To Send (RTS)
8	Clear To Send (CTS)
9	No Connection

Pin 1



9 Pin Male
(Pin Side)

DVI/VGA Ports

DVI and VGA ports provide video signals. The Industrial Vision Processor requires a monitor and keyboard when it first starts, and to configure the system. A VGA cable (5 meters maximum) with the appropriate adapter can be used on this connector.

USB Ports

USB 3.0 Ports can be used to connect a mouse and keyboard. The Industrial Vision Processor requires a monitor and keyboard when it first starts, and to configure the system. Other USB devices connected to these ports may interfere with normal vision system operations and are not supported. USB cameras cannot be used with the MX-E90 Industrial Vision Processor.

CAMERA CABLE

M1xx and E1xx

The terminal block and cable for connecting M1xx and E1xx cameras are listed in the table below. For connection diagrams, see "M1xx, E1xx and E2-xxx Camera Connection" on page 43. The last two digits of the part number indicate the cable length in meters.

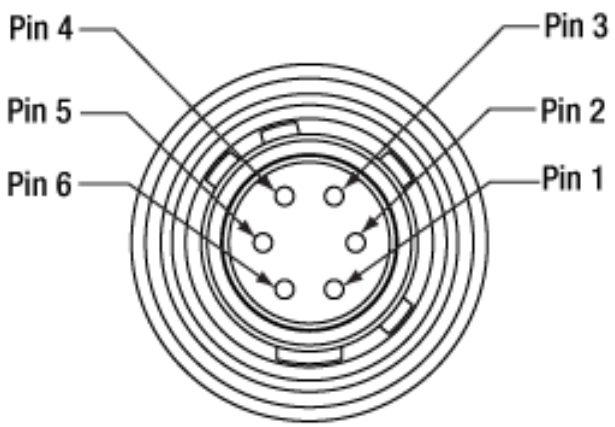
CONNECTOR TYPE	PART NUMBER
Terminal Block	661-0399
Camera Cable - DB9 to 6-pin Hirose Male (for use with above terminal block)	606-0674-xx
Hirose 6-pin Male to pigtail (for use with no terminal block)	606-0672-xx

Camera Connections with Pigtail Cable

The color code for setting up the trigger circuit without a terminal block is shown here. See "M1xx, E1xx and E2-xxx Camera Connection" on page 43 for setting up the trigger circuit with a terminal block.

PIN	WIRE COLOR	SIGNAL NAME	NOTES
1	White/Blue	Power GND	(Not use with the PoE)
2	White/Orange	I/O Ground	
3	White/Green	Strobe Trigger Out	
4[a]	Green	Not Used	DO NOT APPLY ANY VOLTAGE DIRECTLY TO THIS OUTPUT. DO NOT WIRE OUTPUTS IN PARALLEL
5	Orange	Camera Trigger In	0 to +24 VDC recommended Off: 0 to +1.4 VDC On: +2.2 to +24 VDC; 5 to 15 ma Maximum +30 VDC
6	Blue	Power +24Volt	(Not use with the PoE)
Cable Shield	Metal	GND (Earth)	Connect to Earth or Station Ground

a. The M1xx camera's Strobe Trigger Out is normally closed (it opens to trigger the strobe). Do not wire multiple cameras' strobe outputs in parallel to trigger a single strobe.



CHAPTER 7
SYSTEM PROTECTION TOOL

This chapter documents the System Protection Tool. This tool enhances the security of the Vision Processor against system's files corruption that might be caused by unexpected shutdowns or malware attacks. System Protection Tool allows the user to activate a mode in which the critical system's files are protected from unwanted changes. When the System Protection is disabled any file modification will be stored on the disk and it will persist after reboot.

NOTE: When the System Protection is enabled any change or deletion on the protected disk will be restored after system reboot.

LOCATIONS NOT AFFECTED BY THE SYSTEM PROTECTION TOOL

When the System Protection Tool is active, only a subset of system's files is protected. The user can apply permanent changes in the following locations, even if system protection is enabled:

- IMPACT installation folder (C:\Datalogic)
- Network Settings
- User folder (Desktop, Downloads, Documents, Pictures, Videos)
- System's logs

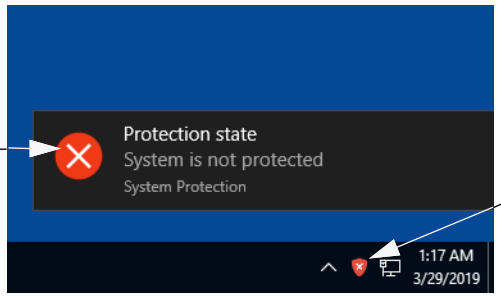
CAUTION: In addition to enabling the System Protection Tool, Datalogic always recommends that you back up these locations, including the IMPACT installation folder, to protect system, data and configuration files.

HOW TO USE THE SYSTEM PROTECTION TOOL

When the user starts the Vision Processor for the first time, the System Protection tool is not enabled by default. A warning message on the tray-bar icon in the lower- right

corner of the screen will be visible. The user will also receive a notification popup message on the screen.

Notification popup. It is visible for a few seconds after the system starts up.



Tray-bar icon, it is always visible. The color represents the protection state:

red = the protection is disabled.

green = the protection is enabled.

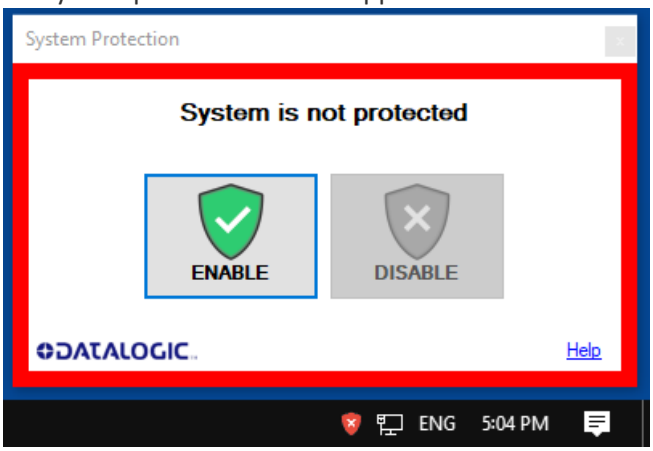
yellow = reboot the system to apply the selected mode.

The System Protection Tool interface can be opened:

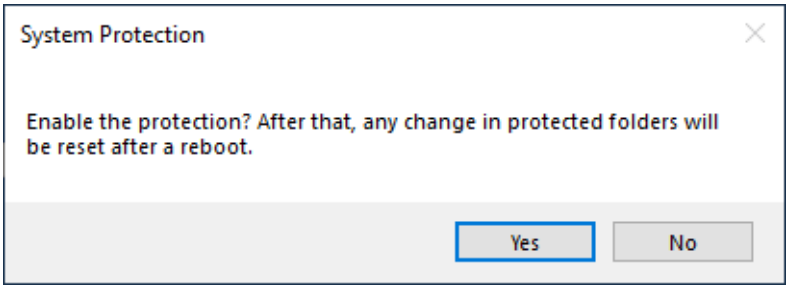
- By clicking on the notification popup.
- By right-clicking the tray-bar icon then, “Configure”.
- From Start Menu>Datalogic>System Protection.

To enable the protection

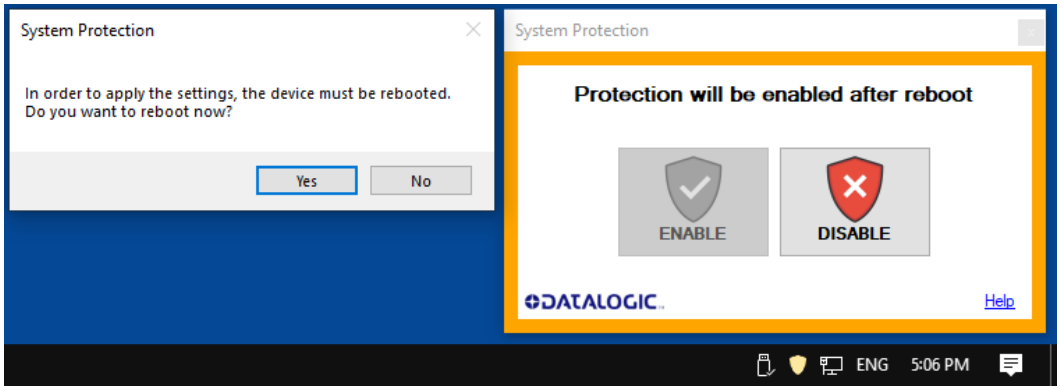
1. Open the System Protection tool interface.
2. Click the **ENABLE** button to start the system configuration.
3. Reboot the system to apply the new settings.
   Before rebooting, it is still possible to perform any change to the whole system since the protection is not active yet.
4. Users can cancel the pending configuration by clicking the DISABLE button. No change to the system protection will be applied.



5. A message box is shown, asking the user a first confirmation for the new setting. Press **YES** to enable System Protection.

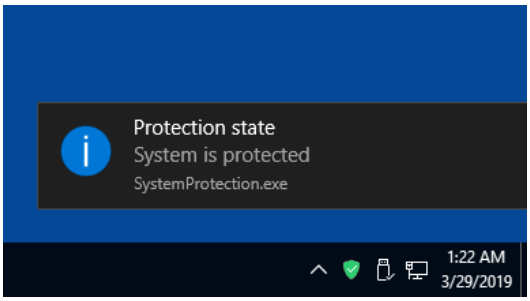


6. A message box is displayed asking the user for confirmation again before applying the setting.
   Press **YES** to continue.



7. Wait for the system reboot.

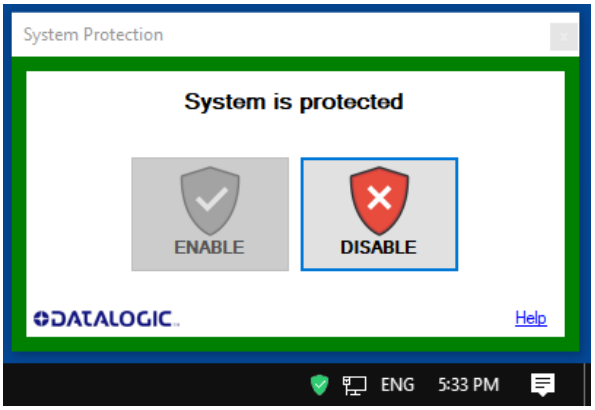
8. When the System Protection Tool is enabled, the following popup is shown:



To disable the protection

NOTE: When the System Protection is disabled the system is not protected against disk corruption or malware attacks. Disable the protection only to make disk changes.

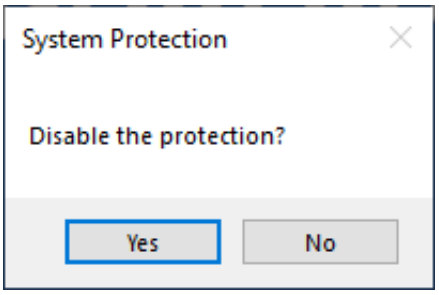
1. Open the System Protection tool interface.



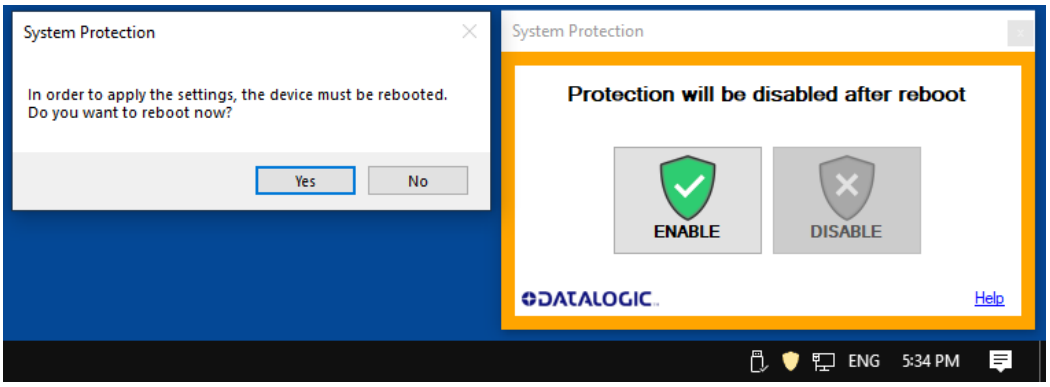
2. Click the **DISABLE** button.

3. Reboot the system to apply the changes.
   Before rebooting, it is still possible to cancel the new configuration.

4. A message box is shown, asking the user a first confirmation for the new setting. Press **YES** to disable System Protection



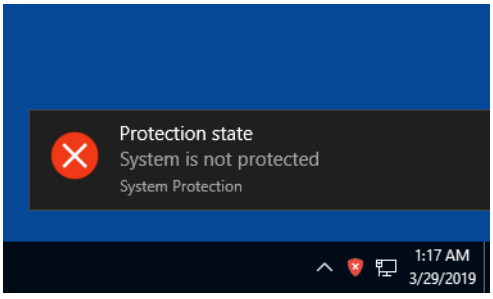
5. A message box is displayed asking the user for confirmation again before applying the setting.
Press **YES** to continue.



6. Wait for system reboot

NOTE: Do not turn off or unplug the system while Windows is shutting down.

7. Check if the Tray-bar icon is Red (protection disabled)



To install a new program in MX-E90

1. Disable the System Protection Tool.
2. Install your program.
3. Enable the System Protection Tool.

CHAPTER 8
MULTILINGUAL USER INTERFACE (MUI)

This chapter describes how to use the Windows® Multilingual User Interface on the Datalogic MX-E90 Vision Processor. The Microsoft® Windows user interface can be displayed in a variety of languages using the MUI.

NOTE: MUI only applies to MX-E90 Vision Processors running Windows 10 IoT Enterprise.

Datalogic optionally provides several MUI languages already installed.

The MUI provides nearly the same level of language support as the localized version of the operating system, with a few minor exceptions. Visit the Microsoft web site (www.microsoft.com) for more details.

There are several levels of human language support in Impact software. First, the custom end-user interfaces (Control Panels in Impact CPM) use Unicode UTF-8 encoding. This means that user interfaces for the factory floor are created in the most appropriate language for the users at the factory. The default human language in the Impact software editing environment, VPM, CPM, etc., is English but it has been translated into Chinese Simplified and other languages. All the documentation is available in English only.

The MX-E90 Vision Processor is optionally shipped with the following nine languages installed:

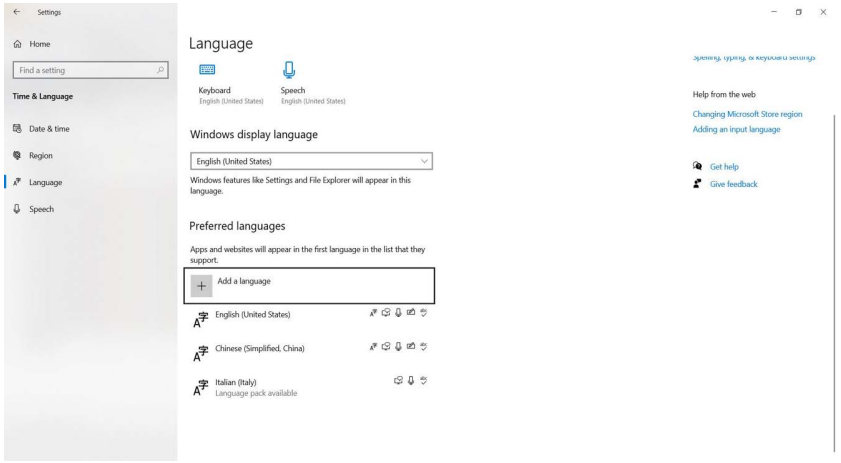
- English
- Chinese
- Chinese Simplified
- French
- German
- Italian
- Japanese
- Korean
- Spanish

To choose a new user interface language

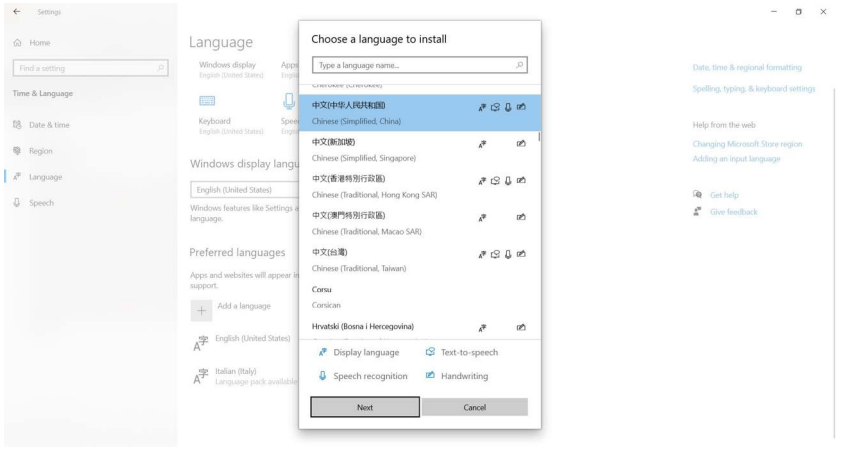
1. Click Start and choose Settings.

2. In the Settings window, select the icon labeled Time & Language.

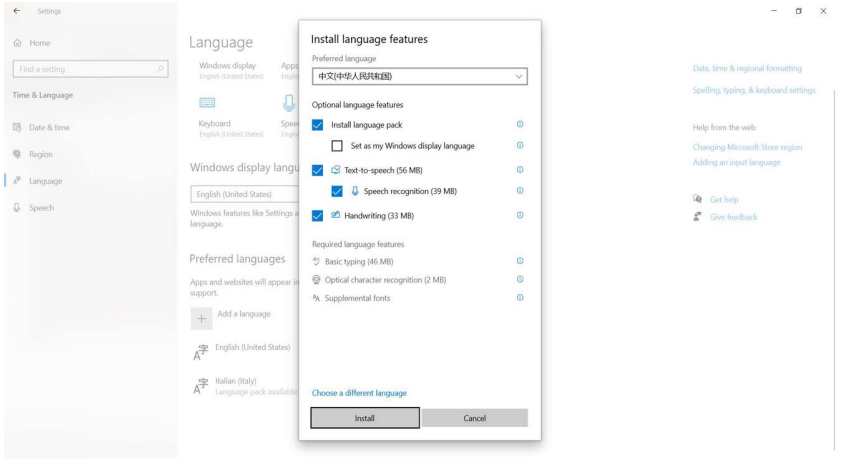
3. Select Language tab following which select the Add a language option



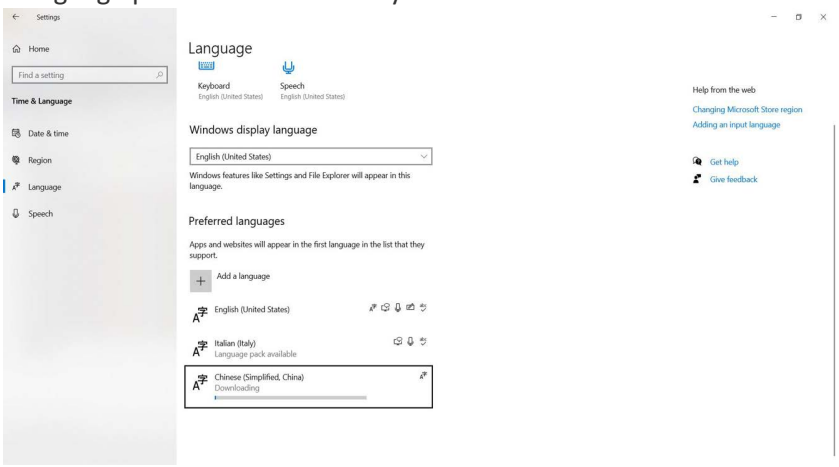
4. Once, Add a language option is selected. A drop-down list of the available languages appears. Select the desired language from this list and click next.



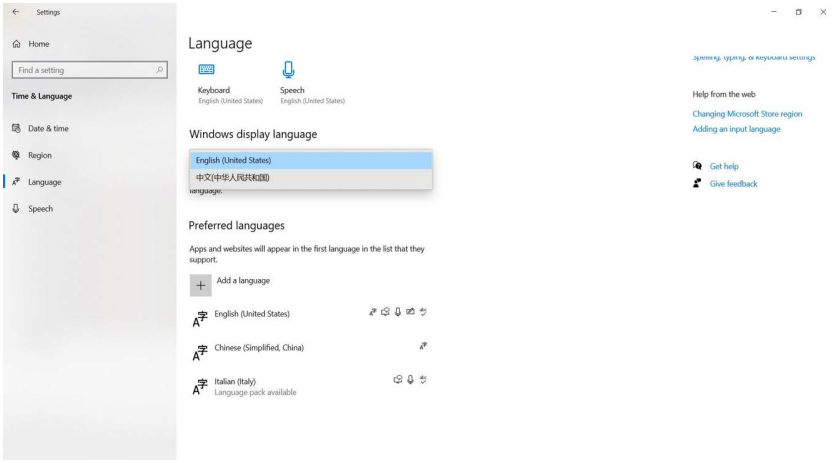
5. Enable speech recognition (default), handwriting (default) and then click install.



6. The language pack will automatically download and install.



7. Once the language pack is installed, make it as default using the Windows display language tab. Sign-out and sign-in.



CHAPTER 9
SYSTEM RESTORATION

This chapter describes how the Restoration Partition on Datalogic MX-E90 Industrial Vision Processor can be used to restore the vision device to its original factory configuration.

NOTE: Completing this process will delete ALL the data on the Processor drive. You should create and maintain a current backup of any data that you cannot replace on the drive before attempting a language change and System Restoration.
THIS SYSTEM RESTORATION WILL NOT RESTORE ANY DATA YOU HAVE ADDED TO THE DRIVE SINCE THE PROCESSOR LEFT THE FACTORY.

After the MX-E90 Processor factory configuration was complete, an image of the system drive was created. A copy of this drive image was saved on a separate partition on the processor drive. To restore the system to its factory configuration, load this Restoration Partition onto the primary part of the drive so it can be used.

MX-E90 SYSTEM RESTORATION

1. Turn off processor power for 30 seconds or unplug the analyzer.
2. Plug in Keyboard, Monitor and Mouse.
3. Turn on processor power. While the system is restarting, repeatedly press the F8 key on the computer keyboard when you see “Datalogic” on the screen.
4. The menu displayed in Figure 1 should appear on the screen after a few seconds. If the menu does not appear, the system will continue until the Windows restart is complete. If this happens, restart this procedure at step 1.

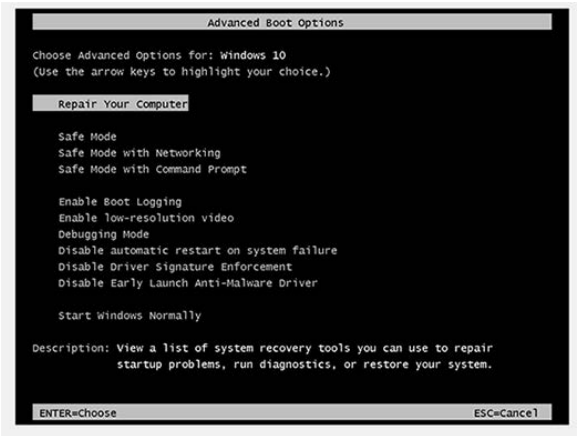


Figure 1 Advanced Boot options

5. Press Enter to choose “Repair Your Computer.”

6. The menu “Choose an Option” is displayed, click “Troubleshoot”.

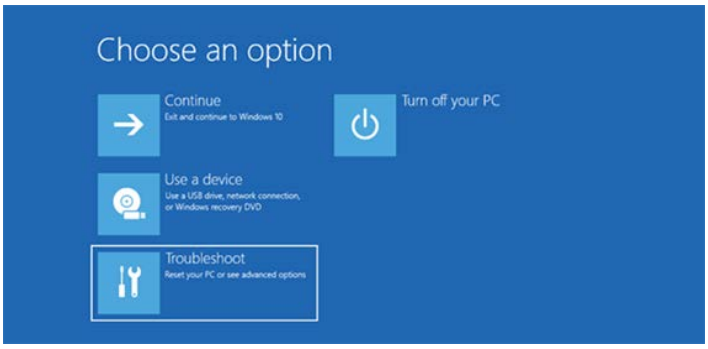


Figure 2

7. When the Troubleshoot menu is displayed, click “Advanced options”.

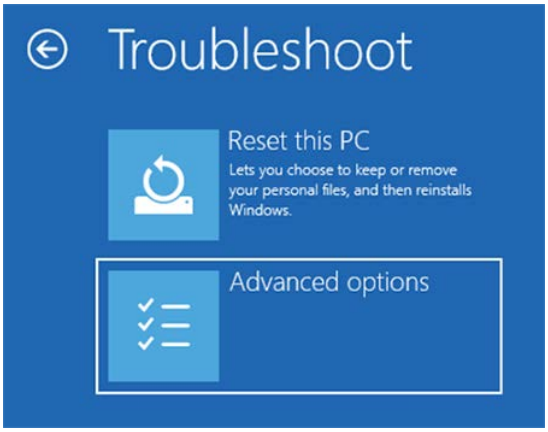


Figure 3

8. In the Advanced options menu, select “System Image Recovery”.

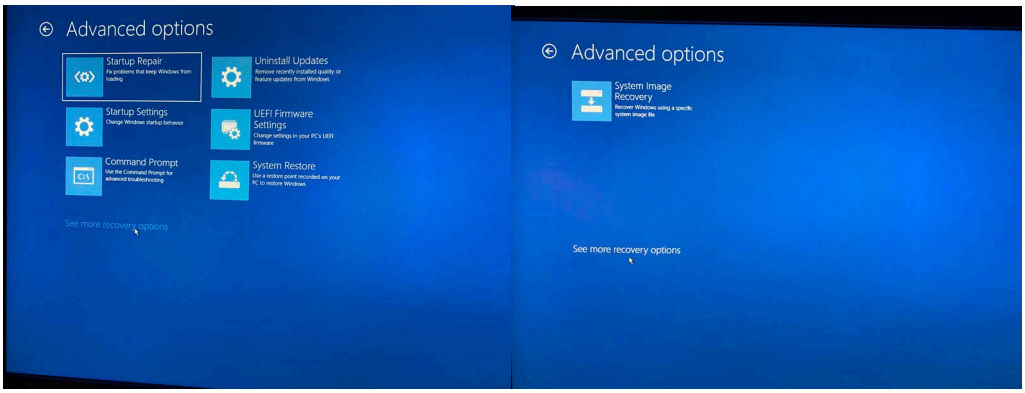


Figure 4

9. In the System Image Recovery menu in Figure, click “Administrator”.

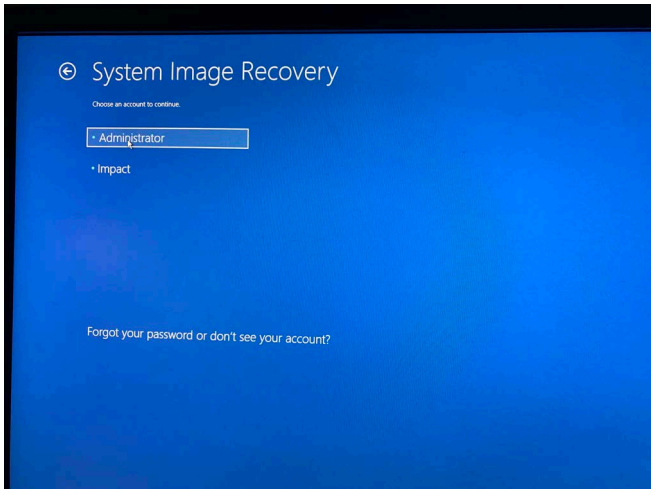


Figure 5

10. You do not need to enter a Password, just click “Continue”.

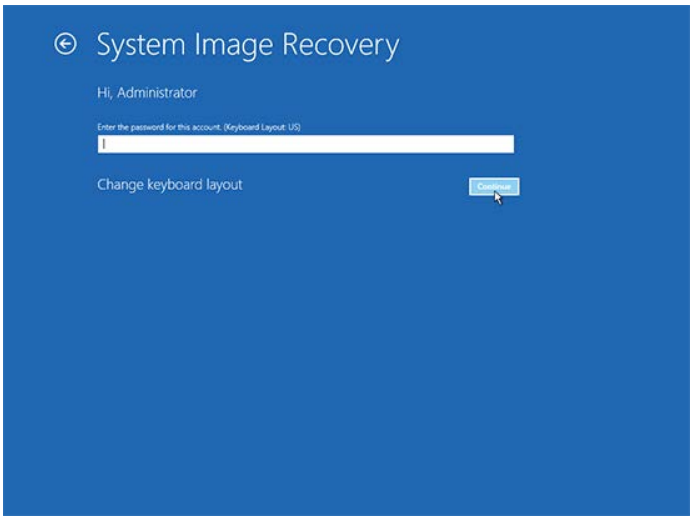


Figure 6

11. When “Re-image your computer window” is displayed click “Next”.

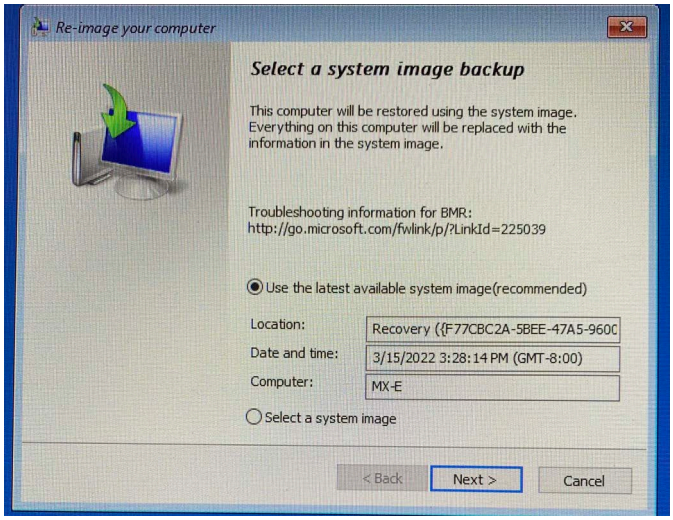


Figure 7

12. In the menu (Figure 10), you have a final chance to exit the Restoration process without making any changes.

- To continue with the Restoration, click “Yes”.
- To Exit the Restoration without making any changes click “No”.

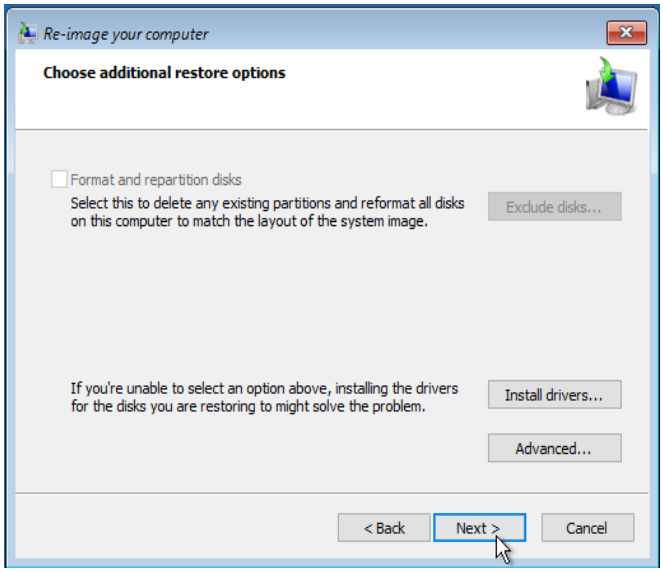


Figure 8

13. In the next “Re-image your computer” window click “Finish”.

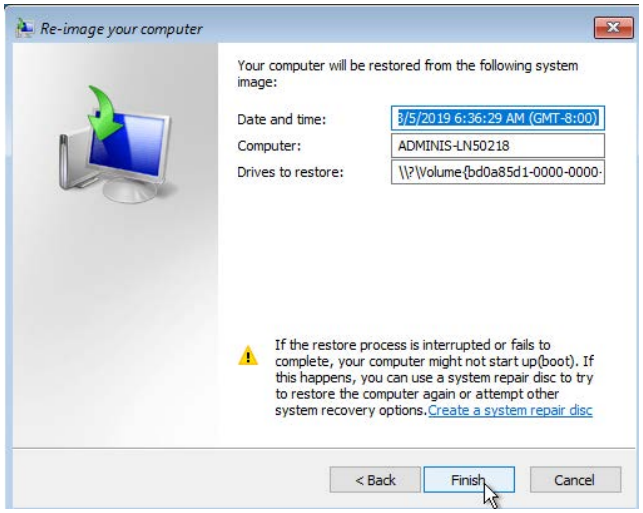


Figure 9

14. In the menu, you have a final chance to exit the Restoration process without making any changes.

- To continue with the Restoration, click “Yes”.
- To Exit the Restoration without making any changes click “No”.

NOTE: This page is the final warning you will receive before System Restoration takes place. When you continue past this point, ALL THE DATA ON THE PROCESSOR DRIVE IS DELETED and the drive is restored to the factory state.

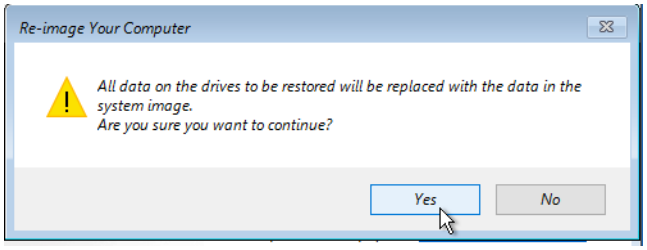


Figure 10

15. If you typed “yes” in the previous step, the Restoration begins, with the progress displayed as seen in the figure below.

CAUTION: Do NOT stop the Restoration process.

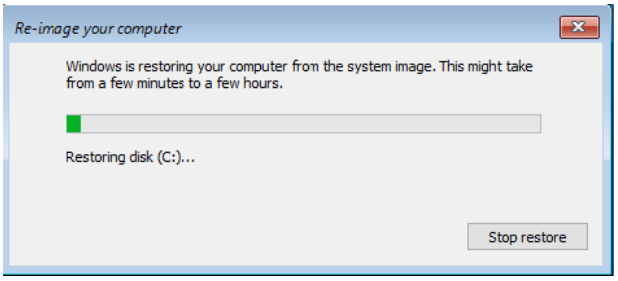


Figure 11

16. When this part of the Restoration is complete, the system shuts down.

17. Turn on processor power. When the Operating System start is complete, the Vision Device End User License is displayed. Click the I Agree button and the Impact Vision Devices will start.

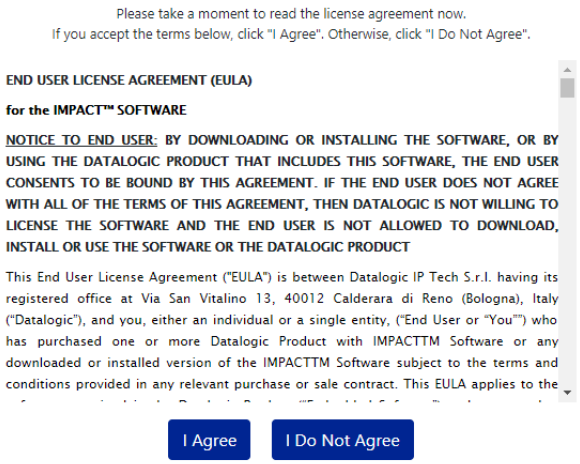
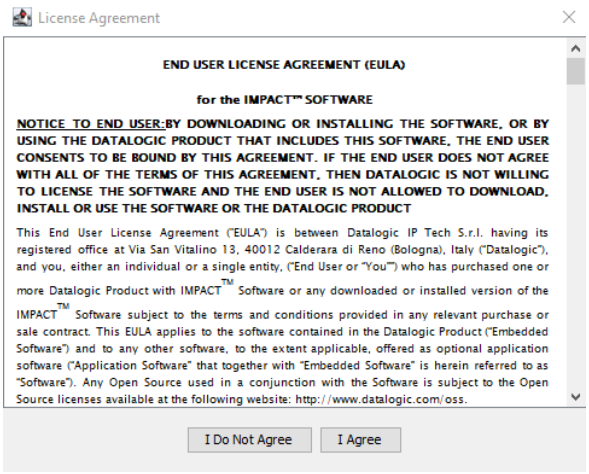


Figure 12

18. The first time you double click the “VPM” icon on the Desktop an Impact “End User License Agreement” is displayed (above Figure). Click the ‘I Agree’ button to finish the Restoration. The processor is now configured exactly as it was when it left the factory.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I Do Not Agree
I Agree

Figure 13

DATALOGIC

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806000550 (Rev G) December 2024